Borough of Folsom

Atlantic County, New Jersey

Municipal Stormwater Management Plan

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Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Borough of Folsom ("the Borough") to address stormwater-related impacts. The creation of this plan is required by N.J.A.C. 7:14A-25 Municipal Stormwater Regulations. This plan contains all of the required elements described in N.J.A.C. 7:8 Stormwater Management Rules. The 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. 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 describes long-term operation and maintenance measures for existing and future stormwater facilities.

A "build-out" analysis has been included in this plan based upon existing zoning and land available for development. The plan also addresses the review and update of existing ordinances, the Borough Master Plan, and other planning documents to allow for project designs that include low impact development techniques. 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.

Goals

The goals of this MSWMP are to:

- 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;
- maintain groundwater recharge;
- prevent, to the greatest extent feasible, an increase in nonpoint 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; and
- protect public safety through the proper design and operation of stormwater basins.

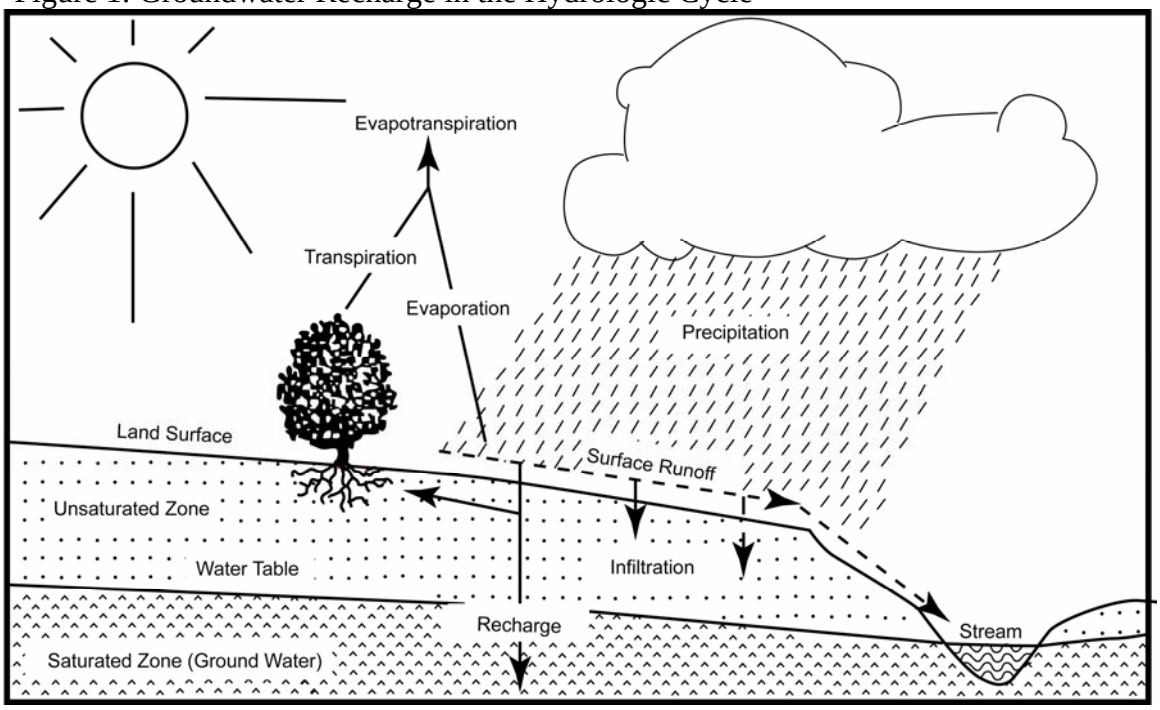
To achieve these goals, this plan outlines specific stormwater design and performance standards for new development. Additionally, the plan proposes stormwater management

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 stormwater infrastructure to be implemented to protect public safety.

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. 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.

Figure 1: Groundwater Recharge in the Hydrologic Cycle



Source: New Jersey Geological Survey Report GSR-32.

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.

In addition to increased pollutant loading, 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 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.

Background

The Borough of Folsom encompasses an 8.27 square mile area in Atlantic County. For several reasons, land use within the Borough has remained largely unchanged over the last thirty (30) years. First, and most significantly, is the passage of the Pinelands Preservation Act by the New Jersey State Legislature in 1979. This legislation created the Pinelands Commission, a public agency charged with the planning and preservation of the Pinelands National Reserve. Due in part to the low density of existing development, as well as other environmental factors,

the majority of the land in the Borough of Folsom was classified as a Pinelands Forest Area. This designation severely limits the development potential of any lands within the area. The Borough contains no regional growth areas and, therefore, pressure from development is negligible.

Over the last ten (10) years, the population of the Borough has decreased from 2,181 in 1990, to 1,972 in 2000. The decrease in population and the lack of significant new development has resulted in little increase in stormwater runoff volumes and the pollutant loads that have been added to the waterways of the municipality.

The Borough is located entirely within the Great Egg Harbor Watershed. The Borough contains three estuaries known as the Great Egg Harbor River, Hospitality Branch and Penny Pot Stream. The Borough also contains several lakes including a portion of Cains Mill Lake, Braddock Lake, Cushman Lake and Collings Lake.

The New Jersey Department of Environmental Protection (NJDEP) has established an Ambient Biomonitoring Network (AMNET) 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 macroinvertebrates by NJDEP on a five-year cycle. 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 biometrics related to benthic macroinvertebrate community dynamics.

Three water bodies within Borough have been classified as impaired (see table 1 below). These water bodies include Braddock Lake, Cushman Lake, and the Great Egg Harbor River. Samples collected from this site have frequently exceeded the states criteria on the concentrations listed in the table below. This means that these water bodies are impaired and the NJDEP is required to develop a Total Maximum Daily Load (TMDL) for these pollutants for each waterway. No TMDL have been established for these waterways to date.

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 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 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 presents the extent to which New Jersey waters are attaining water quality standards, and identifies waters that are impaired. Sublist 5 of the Integrated List constitutes the list of waters impaired or threatened

by pollutants, for which one or more TMDLs are needed. A portion of sublist five (table 1) containing waters within the Borough is shown below.

Table 1: Impaired Waterways in the Borough

No.	Sublist	Watershed Region	WMA	Station Name	Site ID	Parameters	Data Source
1	5	Atlantic Coast	15	Braddock Lake	Collings Lakes #1	Fecal Coliform	Atlantic County HD
5	5	Atlantic Coast	15	Cushman Lake	Collings Lakes #2 (Jay Lake North), Collings Lakes #3	Fecal Coliform	Atlantic County HD
6	5	Atlantic Coast	15	Great Egg Harbor River @ Folsom	01411000, 15-GEH-2	pH, Copper, Lead	NJDEP/USGS Data, Metal Recon

Source: www.nj.gov/dep/wmm/sgwqt/wat/index.html.

Design and Performance Standards

The Borough will 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 and loss of groundwater recharge in receiving water bodies. The design and performance standards 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 Borough's standards will meet the regulations of the Pinelands Commission (NJAC 7:50-6.84).

The ordinances will be submitted to the county for review and approval within [24 months of the effective date of the Stormwater Management Rules.]

During construction, Borough inspectors will observe the construction of the project to ensure that the stormwater management measures are constructed and function as designed.

Plan Consistency

The Borough is not within a Regional Stormwater Management Planning Area and no TMDLs have been developed for waters within the Borough; therefore this plan does not need to be consistent with any regional stormwater management plans (RSWMPs) nor any TMDLs. If any RSWMPs or TMDLs are developed in the future, this Municipal Stormwater Management Plan will be updated to be consistent.

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 areas. This Municipal

Stormwater Management Plan will be updated to be consistent with any future updates to the RSIS.

The Borough's Stormwater Management Ordinance requires all new development and redevelopment plans to comply with New Jersey's Soil Erosion and Sediment Control Standards. During construction, Borough inspectors 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 Borough will revise the master plan and ordinances according to the Pinelands Commissions stormwater regulations which have not been established yet. The Borough will adopt the Pinelands Commissions Stormwater Regulations once they are complete. The Boroughs master plan and ordinances will then be revised accordingly. Once the ordinance texts 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 at the time of submission.

Mitigation Plan

If a proposed development requests a variance or exemption from strict compliance with the groundwater recharge, stormwater quantity and stormwater quality requirements outlined in the Municipal Stormwater Management Plan and ordinances, the applicant must provide mitigation in accordance with the following:

1. A mitigation project must be implemented in the same 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 outlined in the Municipal Stormwater Management Plan. The off-site mitigation measures must also be located in the Pinelands Area.

    - The applicant can select a project listed on the Municipal Stormwater Management Plan to compensate for the deficit from the performance standards resulting from the proposed project. At this time, the Borough has not generated any potential mitigation projects.

    - The applicant can obtain the necessary agreements to create a project to compensate for deficit from the performance standards resulting from the proposed project.

    - The applicant must ensure the long-term maintenance of the project including the maintenance requirements under Chapters 8 and 9.

2. If a suitable mitigation site cannot be located in the same drainage area as the proposed development, as discussed under Option 1, the Applicant is allowed to provide funding to

the Borough for an environmental enhancement project. The funding must be equal to or greater than the cost to implement the mitigation outlined above, including the costs associated with purchasing the property or easement for mitigation and the costs associated with the long-term maintenance requirements of the mitigation measure.

- The Borough must expend all contributions collected under Option 2 within five (5) years of their receipt.

Land Use/Build-Out Analysis

A detailed land use analysis for the Borough was conducted. Figure 6 illustrates the existing land use in the Borough based on 1995/97 GIS information from NJDEP. Figure 7 illustrates the HUC14s within the Borough. The Borough zoning map is shown in Figure 8. Figure 9 illustrates the constrained lands within the Borough. The build-out calculations for impervious cover are shown in the tables below.

Table 1.1 presents the pollutant load by type of land cover and usage. Tables 2, 3, 4, 5, 6 and 7 present the build out data and calculations for each Huc14 area within the Borough. Tables 2.1, 3.1, 4.1, 5.1, 6.1, and 7.1 present the non-point source pollution as calculated for each Huc14 area.

Table 2: Pollutant Loads by Land Cover

Land Cover	TP Load (lbs/acre/yr)	TN Load (lbs/acre/yr)	TSS Load (lbs/acre/yr)
High, Medium Density Residential	1.4	15	140
Low Density, Rural Residential	0.6	5	100
Commercial	2.1	22	200
Industrial	1.5	16	200
Urban, Mixed Urban, Other Urban	1.0	10	120
Agriculture	1.3	10	300
Forest, Water, Wetlands	0.1	3	40
Barrenland/Transitional Area	0.5	5	60

Source: NJDEP Stormwater BMP Manual 2004.

Table 3: Build-Out Calculations for the HUC's located in the Borough

HUC 14 and Zone	Total Area (acres)	Existing Dwelling Units	Existing Impervious (acres)	Existing Imp. %	Wetlands / Water Area (acres)	Buildable Area (acres)	Allowable Imp. %	Build-out Impervious (acres)
Penny Pot Stream (GEHR) – HUC14-02040302030070								

F-20	363	8	1.21	0.3	19	344	3	10.32
F-30	324	2	0.81	0.3	159	165	3	4.95
RD	26	3	0.30	1.1	0	26	10	2.60
VR	409	124	20.09	4.9	26	383	20	76.60
AG	313	10	4.52	1.4	42	271	3	8.13
VI	55	1	2.83	5.1	0	55	25	13.75
Totals	1490	148	29.76	2.0	246	1244		116.35
Great Egg Harbor River (39˚32'50" to Hospitality Branch – HUC14-02040302030080								
F-20	1034	38	8.72	0.8	115	919	3	27.57
F-30	676	3	9.70	1.4	517	159	3	4.77
RD	158	138	16.64	10.5	7	151	10	15.10
VR	110	32	3.43	3.1	0	110	20	22.00
AG	15	2	0.36	2.4	0	15	3	0.45
VI	51	2	12.66	24.8	0	51	25	12.75
Totals	2118	230	125.99	5.9	639	1479		82.64
Collings Lakes Tributary (Hospitality Branch) - HUC14-02040302040050								
F-30	4.3	0	1.30	30.2	1.69	2.61	3	0.08
RD	72.9	22	28.38	38.9	1.36	71.54	10	7.15
Totals	77.2	22	29.68	38.4	3.05	74.15		7.23
Three Pond Branch (Hospitality Branch) - HUC14-02040302040060								
F-20	19.71	0	0	0	5.12	14.59	3	0.44
F-30	2.09	0	0	0	1.49	0.60	3	0.02
RD	4.32	0	0.68	15.6	0	4.32	10	0.43
Totals	26.12	0	0.68	2.6	6.61	19.51		0.89
Hospitality Branch (below Piney Hollow Road) - HUC14-02040302040070								
F-20	456.51	7	9.92	2.2	36.5	410.31	3	12.60
F-30	358.80	0	34.30	9.6	179.5	145.00	3	5.38
RD	508.7	302	144.01	28.3	139.3	235.10	10	36.94
FC	40.6	7	6.52	16.1	0.0	34.3	25	10.15
Totals	1,364.61	316	194.75	14.3	355.3	824.71		65.07
Great Egg Harbor River (Hospitality Branch to Piney Hollow Road) – HUC14-0204030204080								
F-20	179	1	0.82	0.5	40.89	138.11	3	4.14
F-30	126.7	0	1.64	1.3	87.36	39.34	3	1.18
RD	28.6	2	1.36	4.8	0	28.6	10	2.86
Totals	334.3	3	3.83	1.1	128.25	206.05		8.18
Totals	5,410.2	719	384.7	7.1	1,378.2	`3,847.4		280.36

Table 4: Non-Point Source Loads at Build-Out by HUC

Zoning District	Build-out Zoning	Buildable Area (acres)	TP (lbs/ac/yr)	TP (lbs/yr)	TN (lbs/ac/yr)	TN (lbs/yr)	TSS (lbs/ac/yr)	TSS (lbs/yr)
Penny Pot Stream (GEHR) – HUC14-02040302030070								

Forest Area (F-20)	Rural Residential, Low Density	344	0.6	206.4	5	1,720	100	34,400
Forest Area (F-30)	Rural Residential, Low Density	165	0.6	99	5	825	100	16,500
Rural Development (RD)	Rural Residential, Low Density	26	0.6	15.6	5	130	100	2,600
Village Residential (VR)	Residential, Medium Density	383	1.4	536.2	15	5,745	140	53,620
Agricultural Production (AG)	Agriculture	271	1.3	352.3	10	2,710	300	81,300
Village Industrial (VI)	Mixed Urban	55	1.0	55	10	550	120	6,600
Totals		1,244		1,264.50		11,680		19,502
Great Egg Harbor River (39˚32'50" to Hospitality Branch – HUC14-02040302030080								
Forest Area (F-20)	Rural Residential, Low Density	919	0.6	551.4	5	4,595	100	91,900
Forest Area (F-30)	Rural Residential, Low Density	159	0.6	95.4	5	795	100	15,900
Rural Development (RD)	Rural Residential, Low Density	151	0.6	90.6	5	755	100	15,100
Village Residential (VR)	Residential, Medium Density	110	1.4	154	15	1,650	140	15,400
Agricultural Production (AG)	Agriculture	15	1.3	19.5	10	150	300	4,500
Village Industrial (VI)	Mixed Urban	51	1.0	51	10	510	120	6,120
Forest Commercial (FC)	Mixed Urban	74	1.0	74	10	740	120	8,880
Totals		1,479		1,035.9		9,195		157,800
Collings Lakes Tributary (Hospitality Branch) - HUC14-02040302040050								
Forest Area (F-20)	Rural Residential, Low Density	919	0.6	551.4	5	4,595	100	91,900
Forest Area	Rural	159	0.6	95.4	5	795	100	15,900

(F-30)	Residential, Low Density							
Rural Development (RD)	Rural Residential, Low Density	151	0.6	90.6	5	755	100	15,100
Village Residential (VR)	Residential, Medium Density	110	1.4	154	15	1,650	140	15,400
Agricultural Production (AG)	Agriculture	15	1.3	19.5	10	150	300	4,500
Village Industrial (VI)	Mixed Urban	51	1.0	51	10	510	120	6,120
Forest Commercial (FC)	Mixed Urban	74	1.0	74	10	740	120	8,880
Totals		1,479		1,035.9		9,195		157,800
Three Pond Branch (Hospitality Branch) - HUC14-02040302040060								
Forest Area (F-20)	Rural Residential, Low Density	14.59	0.6	8.75	5	72.95	100	1,459
Forest Area (F-30)	Rural Residential, Low Density	0.60	0.6	0.36	5	3.00	100	60
Rural Development (RD)	Rural Residential, Low Density	4.32	0.6	2.59	5	21.60	100	432
Totals		19.51		11.70		97.55		1,951
Hospitality Branch (below Piney Hollow Road) - HUC14-02040302040070								
Forest Area (F-20)	Rural Residential, Low Density	420.00	0.6	252.00	5	2,100	100	42,000
Forest Area (F-30)	Rural Residential, Low Density	179.3	0.6	107.58	5	896.5	100	17,930
Rural Development (RD)	Rural Residential, Low Density	369.4	0.6	221.6	5	1,847	100	36,940
Forest Commercial (FC)	Mixed Urban	40.6	1.0	40.6	10	406	120	4,872
Totals		1,009.3		621.8		5,249.5		101,742
Great Egg Harbor River (Hospitality Branch to Piney Hollow Road) – HUC14-0204030204080								

Forest Area (F-20)	Rural Residential, Low Density	138.1	0.6	82.86	5	690.5	100	13,810
Forest Area (F-30)	Rural Residential, Low Density	39.3	0.6	23.58	5	196.5	100	3,930
Rural Development (RD)	Rural Residential, Low Density	28.6	0.6	17.16	5	143	100	2,860
Totals		206		123.6		1,030		20,600