RUTGERS
New Jersey Agricultural
Experiment Station

Draft

Impervious Cover Reduction Action Plan for Marlboro Township, Monmouth County, New Jersey

Prepared for Marlboro Township by the
Rutgers Cooperative Extension Water Resources Program

October 6, 2015

Table of Contents

Attachment: Climate Resilient Green Infrastructure

a. Overview Map of the Project

b. Green Infrastructure Sites

c. Proposed Green Infrastructure Concepts

d. Summary of Existing Conditions

e. Summary of Proposed Green Infrastructure Practices

Introduction

Located in Monmouth County in central New Jersey, Marlboro Township covers approximately 30.4 square miles. Figures 1 and 2 illustrate that Marlboro Township is dominated by urban land uses. A total of 52.0% of the municipality's land use is classified as urban. Of the urban land in Marlboro Township, medium density residential is the dominant land use (Figure 3).

The New Jersey Department of Environmental Protection's (NJDEP) 2007 land use/land cover geographical information system (GIS) data layer categorizes Marlboro Township into many unique land use areas, assigning a percent impervious cover for each delineated area. These impervious cover values were used to estimate the impervious coverage for Marlboro Township. Based upon the 2007 NJDEP land use/land cover data, approximately 14.9% of Marlboro Township has impervious cover. This level of impervious cover suggests that the streams in Marlboro Township are likely impacted.[1]

Methodology

Marlboro Township contains portions of eight subwatersheds (Figure 4). For this impervious cover reduction action plan, projects have been identified in each of these watersheds. Initially, aerial imagery was used to identify potential project sites that contain extensive impervious cover. Field visits were then conducted at each of these potential project sites to determine if a viable option exists to reduce impervious cover or to disconnect impervious surfaces from draining directly to the local waterway or storm sewer system. During the site visit, appropriate green infrastructure practices for the site were determined. Sites that already had stormwater management practices in place were not considered.

[1] Caraco, D., R. Claytor, P. Hinkle, H. Kwon, T. Schueler, C. Swann, S. Vysotsky, and J. Zielinski. 1998. Rapid Watershed Planning Handbook. A Comprehensive Guide for Managing Urbanizing Watersheds. Prepared by Center For Watershed Protection, Ellicott City, MD. Prepared for U.S. Environmental Protection Agency, Office of Wetlands, Oceans and Watersheds and Region V. October 1998

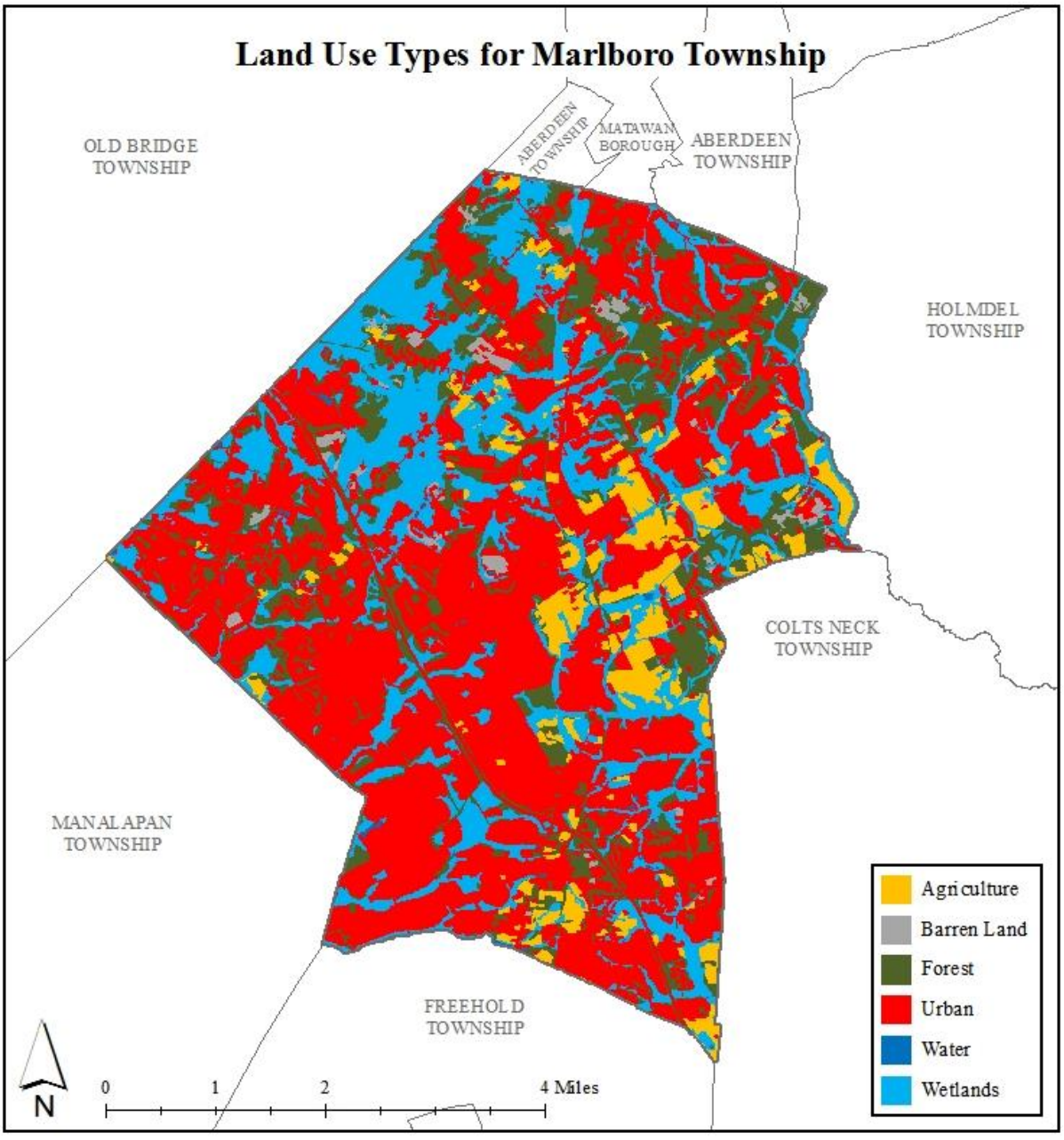


Figure 1: Map illustrating the land use in Marlboro Township

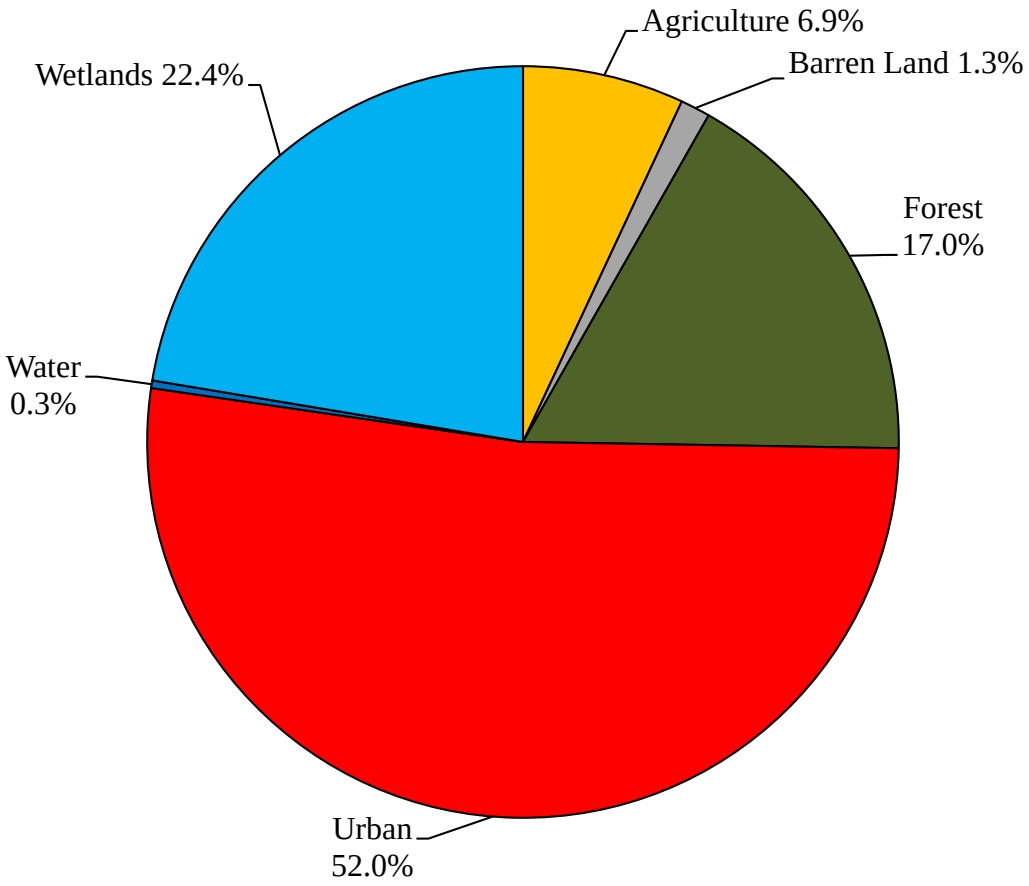


Figure 2: Pie chart illustrating the land use in Marlboro Township

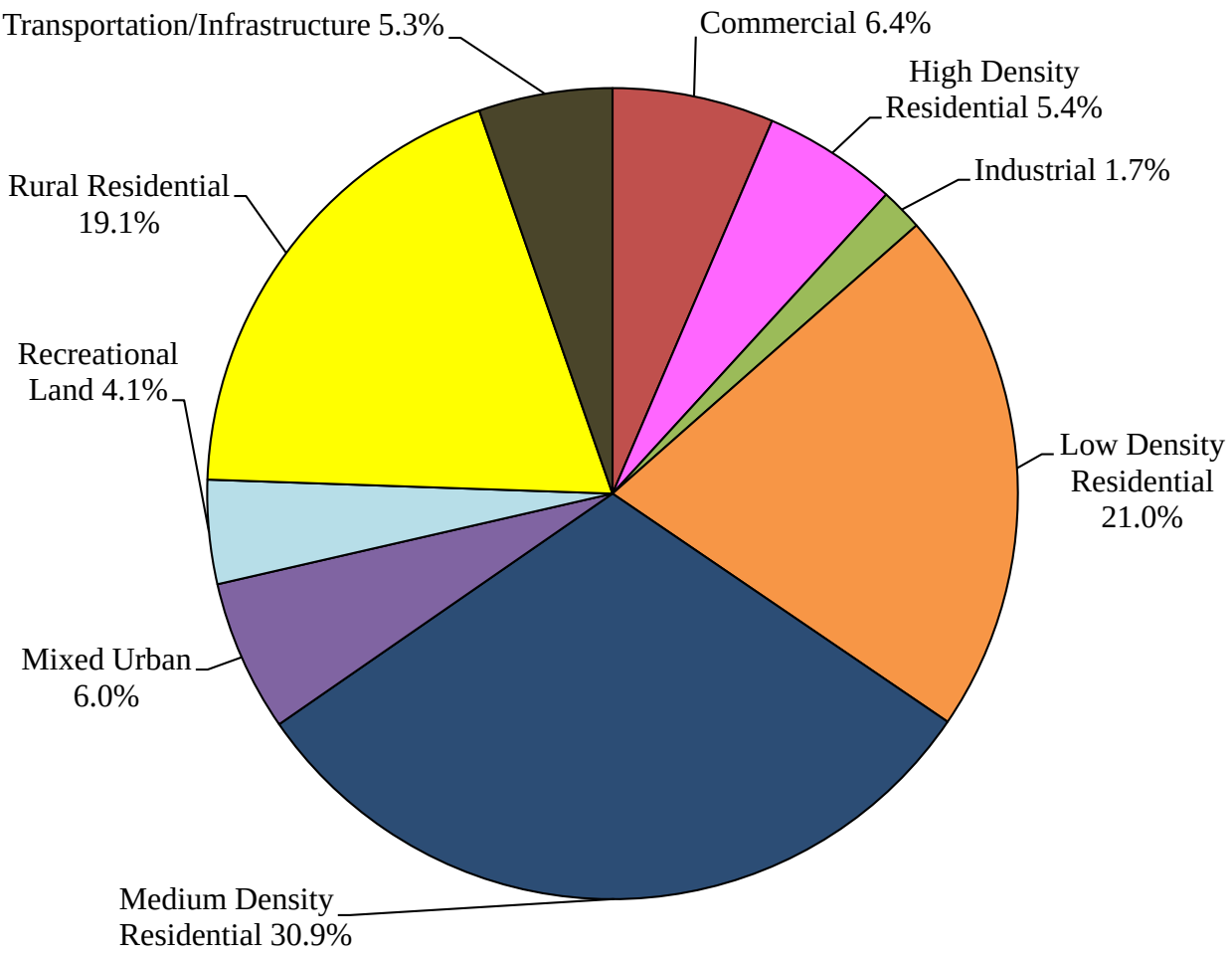


Figure 3: Pie chart illustrating the various types of urban land use in Marlboro Township

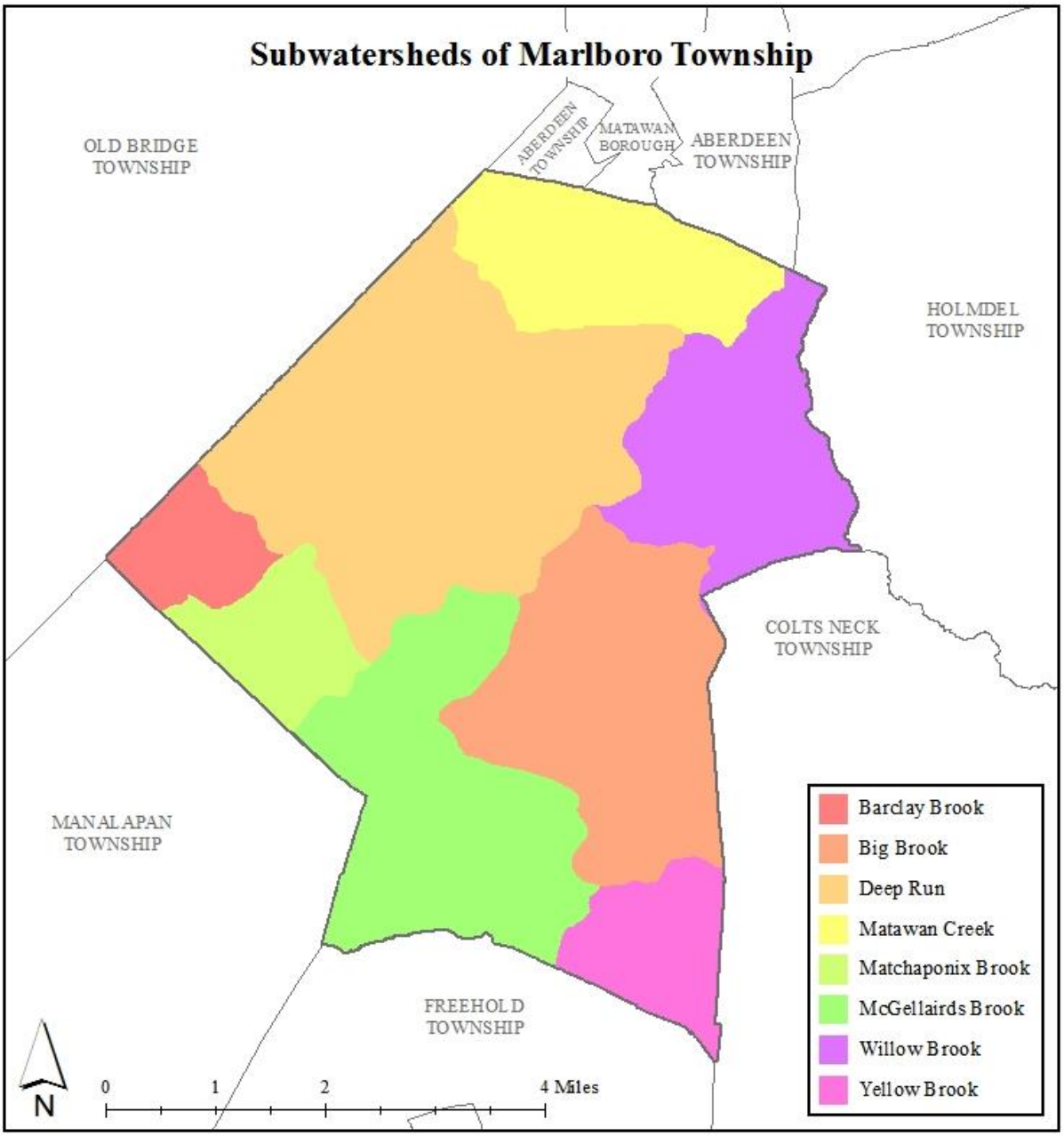


Figure 4: Map of the subwatersheds in Marlboro Township

For each potential project site, specific aerial loading coefficients for commercial land use were used to determine the annual runoff loads for total phosphorus (TP), total nitrogen (TN), and total suspended solids (TSS) from impervious surfaces (Table 1). These are the same aerial loading coefficients that NJDEP uses in developing total maximum daily loads (TMDLs) for impaired waterways of the state. The percentage of impervious cover for each site was extracted from the 2007 NJDEP land use/land cover database. For impervious areas, runoff volumes were determined for the water quality design storm (1.25 inches of rain over two-hours) and for the annual rainfall total of 44 inches.

Preliminary soil assessments were conducted for each potential project site identified in Marlboro Township using the United States Department of Agriculture Natural Resources Conservation Service Web Soil Survey, which utilizes regional and statewide soil data to predict soil types in an area. Several key soil parameters were examined (e.g., natural drainage class, saturated hydraulic conductivity of the most limiting soil layer (K_{sat}), depth to water table, and hydrologic soil group) to evaluate the suitability of each site's soil for green infrastructure practices. In cases where multiple soil types were encountered, the key soil parameters were examined for each soil type expected at a site.

For each potential project site, drainage areas were determined for each of the green infrastructure practices proposed at the site. These green infrastructure practices were designed to manage the 2-year design storm, enabling these practices to capture 95% of the annual rainfall. Runoff volumes were calculated for each proposed green infrastructure practice. The reduction in TSS loading was calculated for each drainage area for each proposed green infrastructure practice using the aerial loading coefficients in Table 1. The maximum volume reduction in stormwater runoff for each green infrastructure practice for a storm was determined by calculating the volume of runoff captured from the 2-year design storm. For each green infrastructure practice, peak discharge reduction potential was determined through hydrologic modeling in HydroCAD. For each green infrastructure practice, a cost estimate is provided. These costs are based upon the square footage of the green infrastructure practice and the real cost of green infrastructure practice implementation in New Jersey.

Table 1: Aerial Loading Coefficients[2]

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

[2] New Jersey Department of Environmental Protection (NJDEP), Stormwater Best Management Practice Manual, 2004.

Green Infrastructure Practices

Green infrastructure is an approach to stormwater management that is cost-effective, sustainable, and environmentally friendly. Green infrastructure projects capture, filter, absorb, and reuse stormwater to maintain or mimic natural systems and to treat runoff as a resource. As a general principal, green infrastructure practices use soil and vegetation to recycle stormwater runoff through infiltration and evapotranspiration. When used as components of a stormwater management system, green infrastructure practices such as bioretention, green roofs, porous pavement, rain gardens, and vegetated swales can produce a variety of environmental benefits. In addition to effectively retaining and infiltrating rainfall, these practices can simultaneously help filter air pollutants, reduce energy demands, mitigate urban heat islands, and sequester carbon while also providing communities with aesthetic and natural resource benefits[3]. A wide range of green infrastructure practices have been evaluated for the potential project sites in Marlboro Township. Each practice is discussed below.

Disconnected downspouts

This is often referred to as simple disconnection. A downspout is simply disconnected, prevented from draining directly to the roadway or storm sewer system, and directed to discharge water to a pervious area (i.e., lawn).

Pervious pavements

There are several types of permeable pavement systems including porous asphalt, pervious concrete, permeable pavers, and grass pavers. These surfaces are hard and support vehicle traffic but also allow water to infiltrate through the surface. They have an underlying stone layer to store stormwater runoff and allow it to slowly seep into the ground.




[3] United States Environmental Protection Agency (USEPA), 2013. Watershed Assessment, Tracking, and Environmental Results, New Jersey Water Quality Assessment Report. http://ofmpub.epa.gov/waters10/attains_state.control?p_state=NJ

Bioretention systems/rain gardens

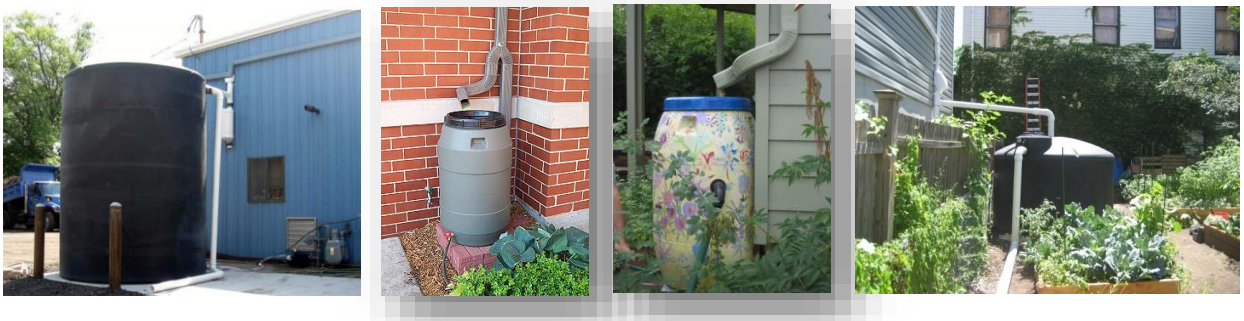
These are landscaped features that are designed to capture, treat, and infiltrate stormwater runoff. These systems can easily be incorporated into existing landscapes, improving aesthetics and creating a wildlife habitat while managing stormwater runoff. Bioretention systems also can be used in soils that do not quickly infiltrate by incorporating an underdrain into the system.

Downspout planter boxes

These are wooden boxes with plants installed at the base of a downspout that provide an opportunity to beneficially reuse rooftop runoff.

Rainwater harvesting systems (cistern or rain barrel)

These systems capture rainwater, mainly from rooftops, in cisterns or rain barrels. The water can then be used for watering gardens, washing vehicles, or for other non-potable uses.



Bioswale

Bioswales are landscape features that convey stormwater from one location to another while removing pollutants and providing water an opportunity to infiltrate.

Stormwater planters

Stormwater planters are vegetated structures that are built into the sidewalk to intercept stormwater runoff from the roadway or sidewalk. Many of these planters are designed to allow the water to infiltrate into the ground while others are designed simply to filter the water and convey it back into the stormwater sewer system.

Tree filter boxes

These are pre-manufactured concrete boxes that contain a special soil mix and are planted with a tree or shrub. They filter stormwater runoff but provide little storage capacity. They are typically designed to quickly filter stormwater and then discharge it to the local sewer system.

Potential Project Sites

Attachment 1 contains information on potential project sites where green infrastructure practices could be installed. The recommended green infrastructure practice and the drainage area that the green infrastructure practice can treat are identified for each potential project site. For each practice, the recharge potential, TSS removal potential, maximum volume reduction potential per storm, and the peak reduction potential are provided. This information is also provided so that proposed development projects that cannot satisfy the New Jersey stormwater management requirements for major development can use one of the identified projects to offset a stormwater management deficit. [4]

[4] New Jersey Administrative Code, N.J.A.C. 7:8, Stormwater Management, Statutory Authority: N.J.S.A. 12:5-3, 13:1D-1 et seq., 13:9A-1 et seq., 13:19-1 et seq., 40:55D-93 to 99, 58:4-1 et seq., 58:10A-1 et seq., 58:11A-1 et seq. and 58:16A-50 et seq., *Date last amended: April 19, 2010*.

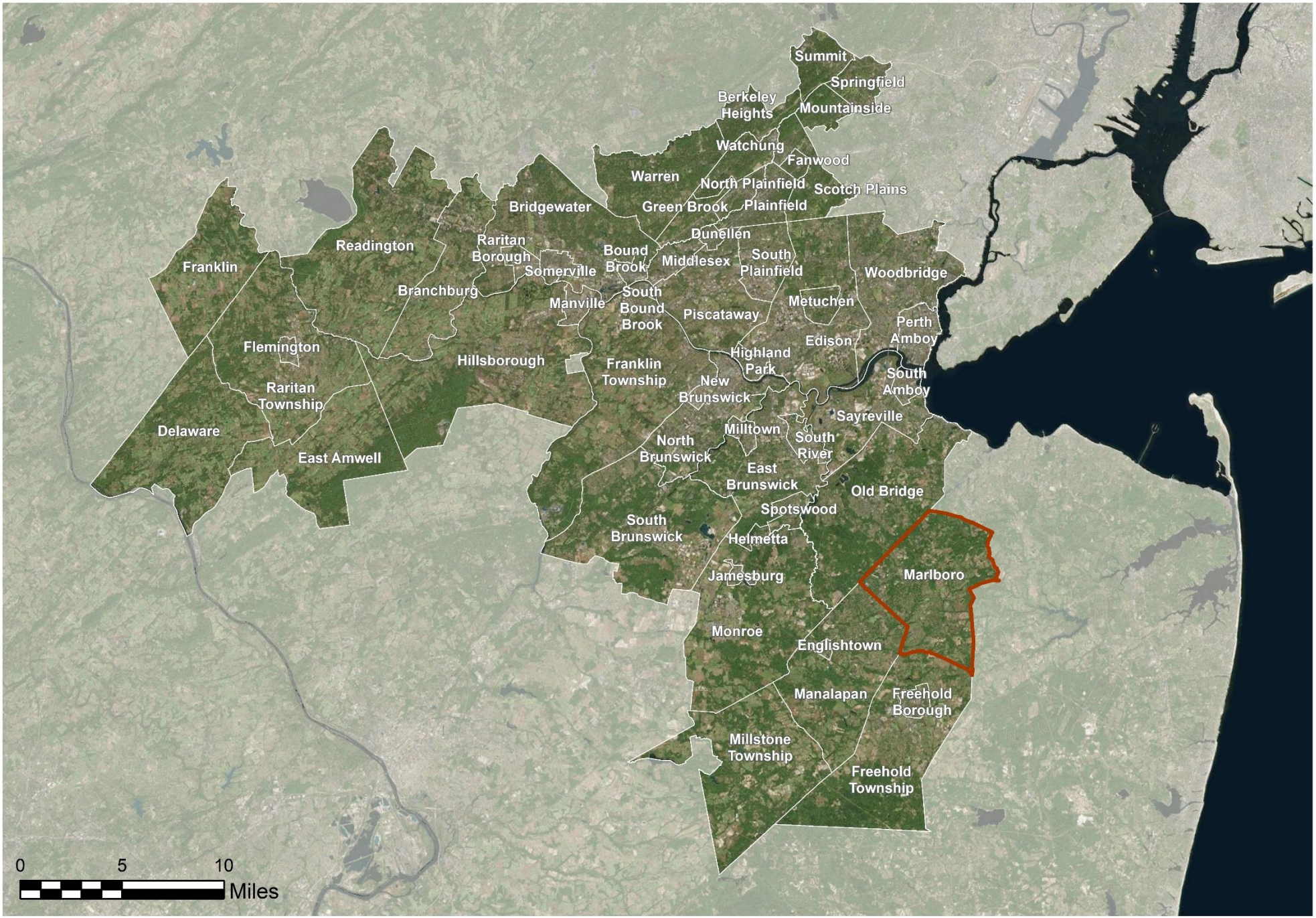
Conclusion

This impervious cover reduction action plan is meant to provide the municipality with a blueprint for implementing green infrastructure practices that will reduce the impact of stormwater runoff from impervious surfaces. These projects can be implemented by a wide variety of people such as boy scouts, girl scouts, school groups, faith-based groups, social groups, watershed groups, and other community groups.

Additionally, development projects that are in need of providing off-site compensation for stormwater impacts can use the projects in this plan as a starting point. The municipality can quickly convert this impervious cover reduction action plan into a stormwater mitigation plan and incorporate it into the municipal stormwater control ordinance.

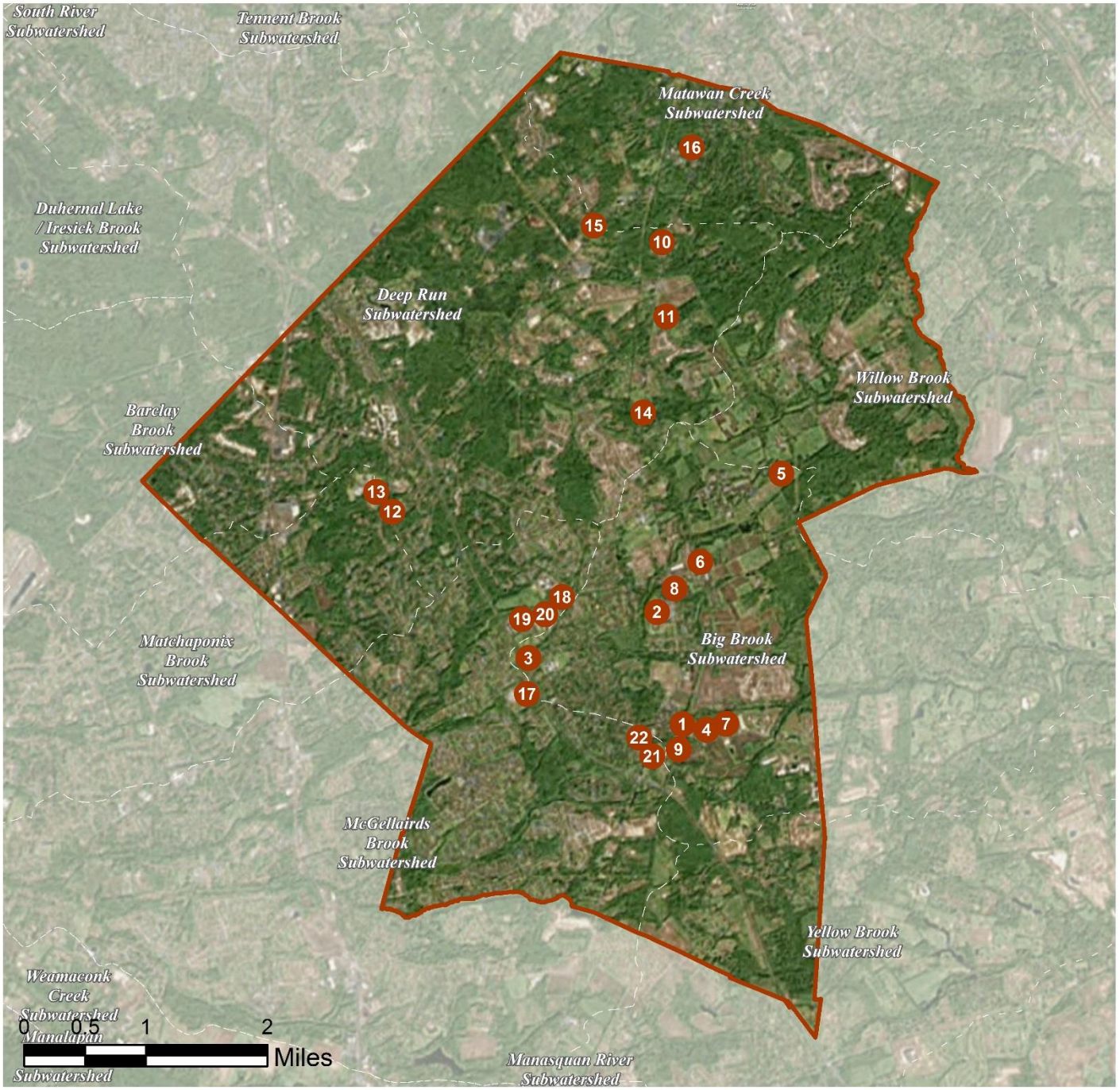
a. Overview Map of the Project

MARLBORO TOWNSHIP: CLIMATE RESILIENT GREEN INFRASTRUCTURE FOR THE RARITAN BASIN



b. Green Infrastructure Sites

MARLBORO TOWNSHIP: GREEN INFRASTRUCTURE SITES



SITES WITHIN THE BIG BROOK SUBWATERSHED:

1. Gordon's Corner Water Company
2. Marlboro High School
3. Marlboro Jewish Center Nursery School
4. Monmouth Worship Center
5. New Hope Foundation: Discovery Institute
6. Old Brick Reformed Church
7. Overseas Chinese Mission Jireh Church
8. Saint Gabriel Church
9. The Goddard School

SITES WITHIN THE DEEP RUN SUBWATERSHED:

10. Morganville Independent Fire Company
11. Morganville United Methodist
12. Robertsville Bible Church
13. Robertsville Bible Parish
14. US Post Office: Route 79
15. US Post Office: Tennant Rd

SITES WITHIN THE MATAWAN CREEK SUBWATERSHED:

16. Commercial Complex

SITES WITHIN THE MCGELLAIRDS BROOK SUBWATERSHED:

17. Congregation Ohev Shalom: Chai Building
18. Marlboro Free Public Library
19. Marlboro Municipal Complex & DPW
20. Marlboro Recreation Center
21. Solomon Schechter Day School
22. US Post Office: Main Street Complex

c. Proposed Green Infrastructure Concepts

GORDON'S CORNER WATER COMPANY

Subwatershed: **Big Brook**

Site Area: **113,346 sq. ft.**

Address: **27 Vanderburg Road**
Marlboro, NJ 07746

Block and Lot: **Block 214.07, Lot 64.01**

The building has directly connected downspouts. Most runoff is directed into a detention basin to the north. Pervious pavement can be utilized in the parking lot to capture and infiltrate this runoff. A rain garden can be constructed near the roadway to capture, treat, and infiltrate additional stormwater from the driveway. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
47	52,777	2.5	26.7	242.3	0.041	1.45

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.085	14	6,455	0.24	820	$4,100
Pervious pavements	0.450	75	34,086	1.28	2,500	$62,500

GREEN INFRASTRUCTURE RECOMMENDATIONS

Gordon's Corner Water Company

- pervious pavements
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

MARLBORO HIGH SCHOOL

Subwatershed: **Big Brook**

Site Area: **2,126,645 sq. ft.**

Address: **95 N Main Street**
Marlboro, NJ 07746

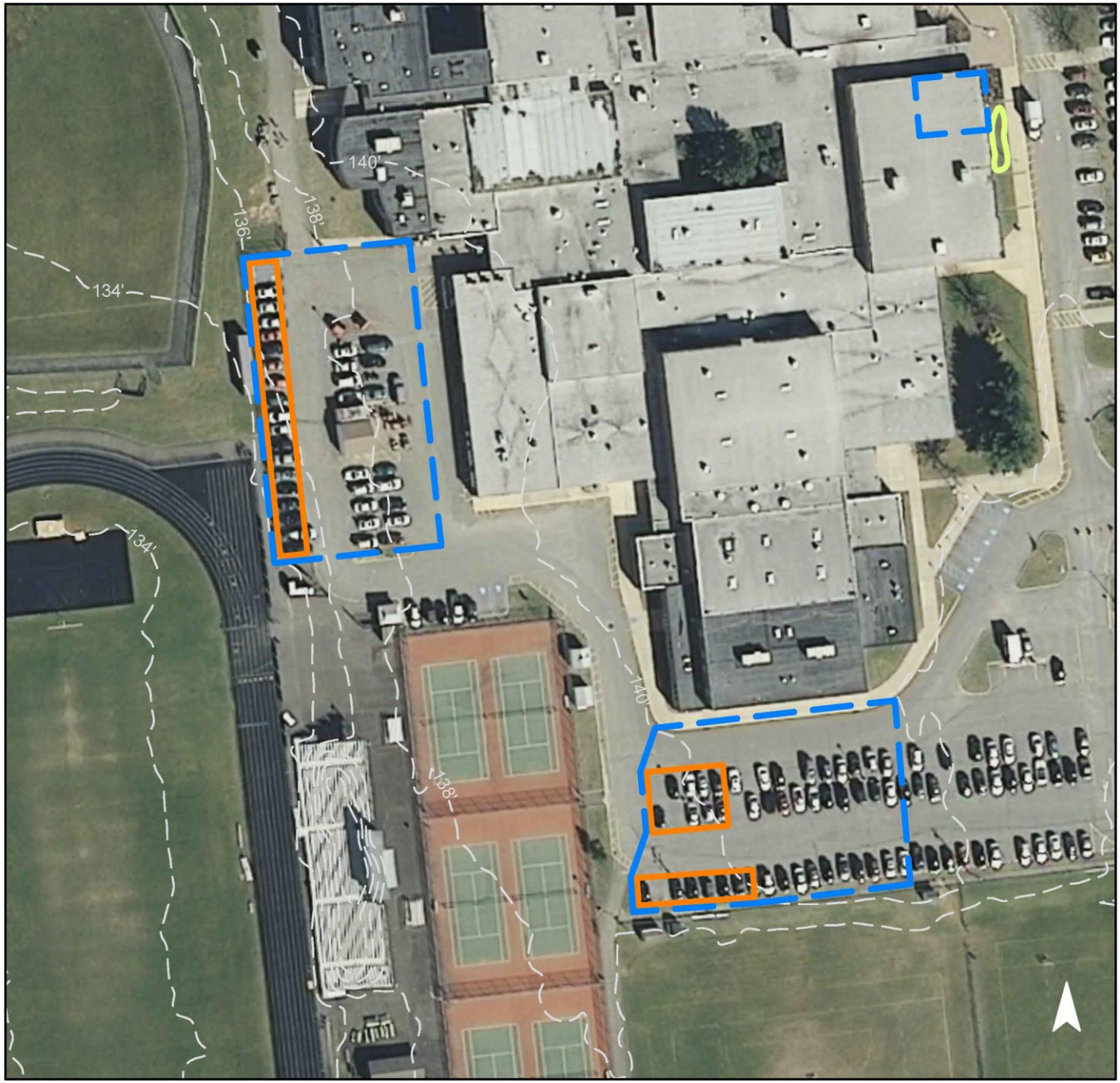
Block and Lot: **Block 225, Lot 199**

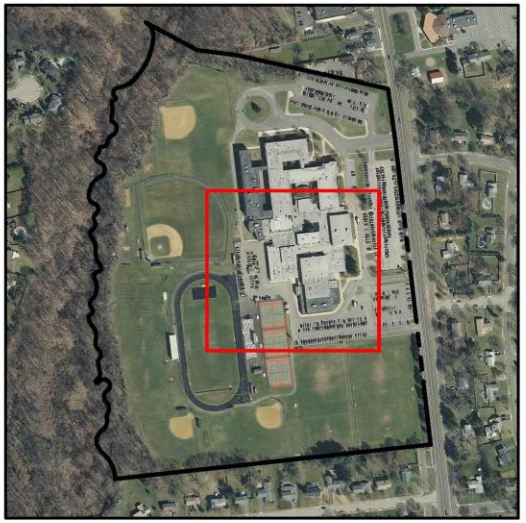
Most of the building has internal drainage, except at the front where downspouts drain onto the driveway. A rain garden can be constructed in front of the school to capture, treat, and infiltrate runoff. Pervious pavement can also be used to replace parking spaces to capture and infiltrate stormwater runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
31	649,107	31.3	327.8	2,980.3	0.506	17.8

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.044	7	3,359	0.13	285	$1,425
Pervious pavements	1.118	187	84,696	3.18	6,870	$171,750

GREEN INFRASTRUCTURE RECOMMENDATIONS





Marlboro High School

- pervious pavements
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

MARLBORO JEWISH CENTER NURSERY SCHOOL

Subwatershed: **Big Brook**

Site Area: **234,220 sq. ft.**

Address: **103 School Road West**
Marlboro, NJ 07746

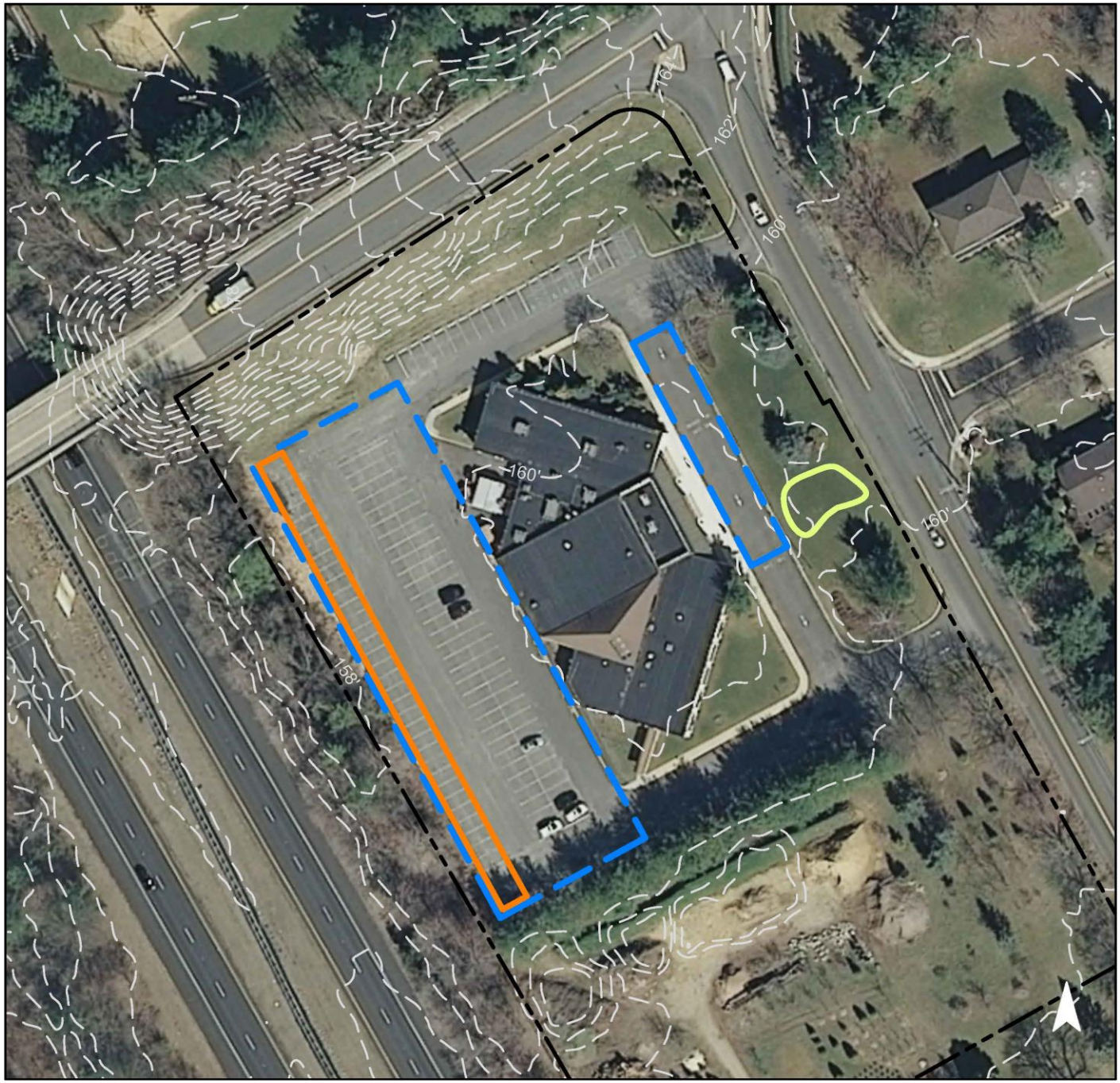
Block and Lot: **Block 322, Lot 20**

Most of the building has internal drainage. The front driveway drains into the roadway, and the parking lot drains into a swale near the highway. A rain garden can be installed in front of the building to treat stormwater from the driveway. Pervious pavement can replace parking spaces along the southwest edge of the parking lot to capture and infiltrate runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
46	108,619	5.2	54.9	498.7	0.085	2.98

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.115	19	8,677	0.33	1,465	$7,325
Pervious pavements	0.967	162	73,274	2.75	6,000	$150,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Marlboro Jewish Center Nursery School

- pervious pavements
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

MONMOUTH WORSHIP CENTER

Subwatershed: Big Brook

Site Area: 590,421 sq. ft.

Address: 37 Vanderburg Road
Marlboro, NJ 07746

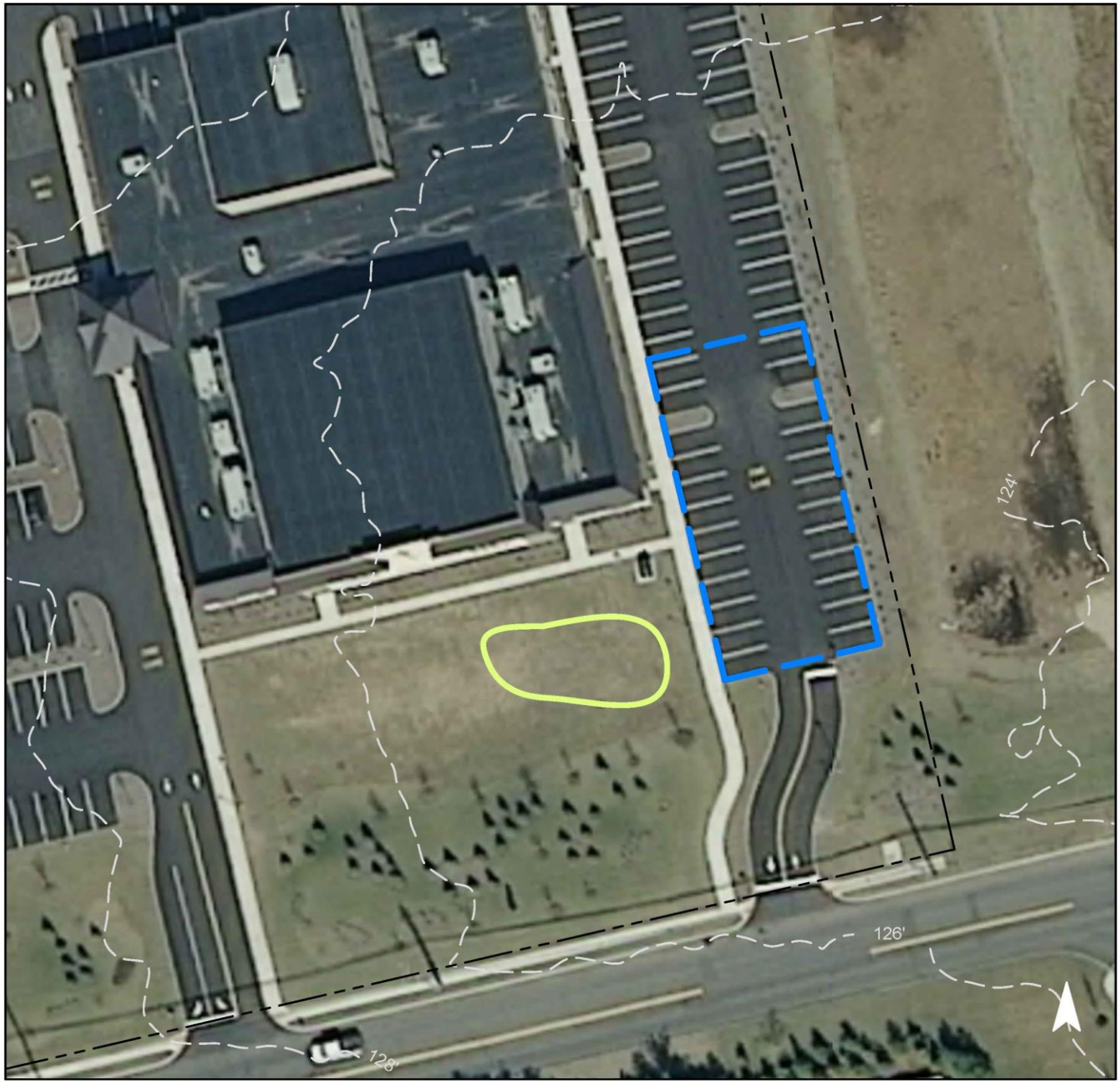
Block and Lot: Block 214.07, Lot 61.01

Runoff from the roof and parking lot appears to drain into an existing bioswale. A rain garden can be constructed in the turf grass area south of the Worship Center to capture, treat, and infiltrate some of this runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
34	200,752	9.7	101.4	921.7	0.156	5.51

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention system	0.208	35	15,790	0.59	2,000	$10,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Monmouth Worship Center

- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 30' 60'

NEW HOPE FOUNDATION: DISCOVERY INSTITUTE

Subwatershed: **Big Brook**

Site Area: **435,486 sq. ft.**

Address: **80 Conover Road**
Marlboro, NJ 07746

Block and Lot: **Block 157, Lot 34.02**

New Hope has a mix of connected and disconnected downspouts, as well as internal drainage. The paved areas drain into catch basin's and all runoff appears to flow into a detention basin at the site's south end. There are several areas where rain garden can be installed to capture, treat, and infiltrate roof runoff. Parking spaces can also be replaced with pervious pavement to capture and infiltrate stormwater. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
46	199,343	9.6	100.7	915.3	0.155	5.47

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.208	35	15,790	0.59	2,000	$10,000
Pervious pavements	0.256	43	19,411	0.73	2,100	$52,500

GREEN INFRASTRUCTURE RECOMMENDATIONS

New Hope Foundation: Discovery Institute

- pervious pavements
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

OLD BRICK REFORMED CHURCH

Subwatershed: **Big Brook**

Site Area: **101,307 sq. ft.**

Address: **490 County Road 520**
Marlboro, NJ 07746

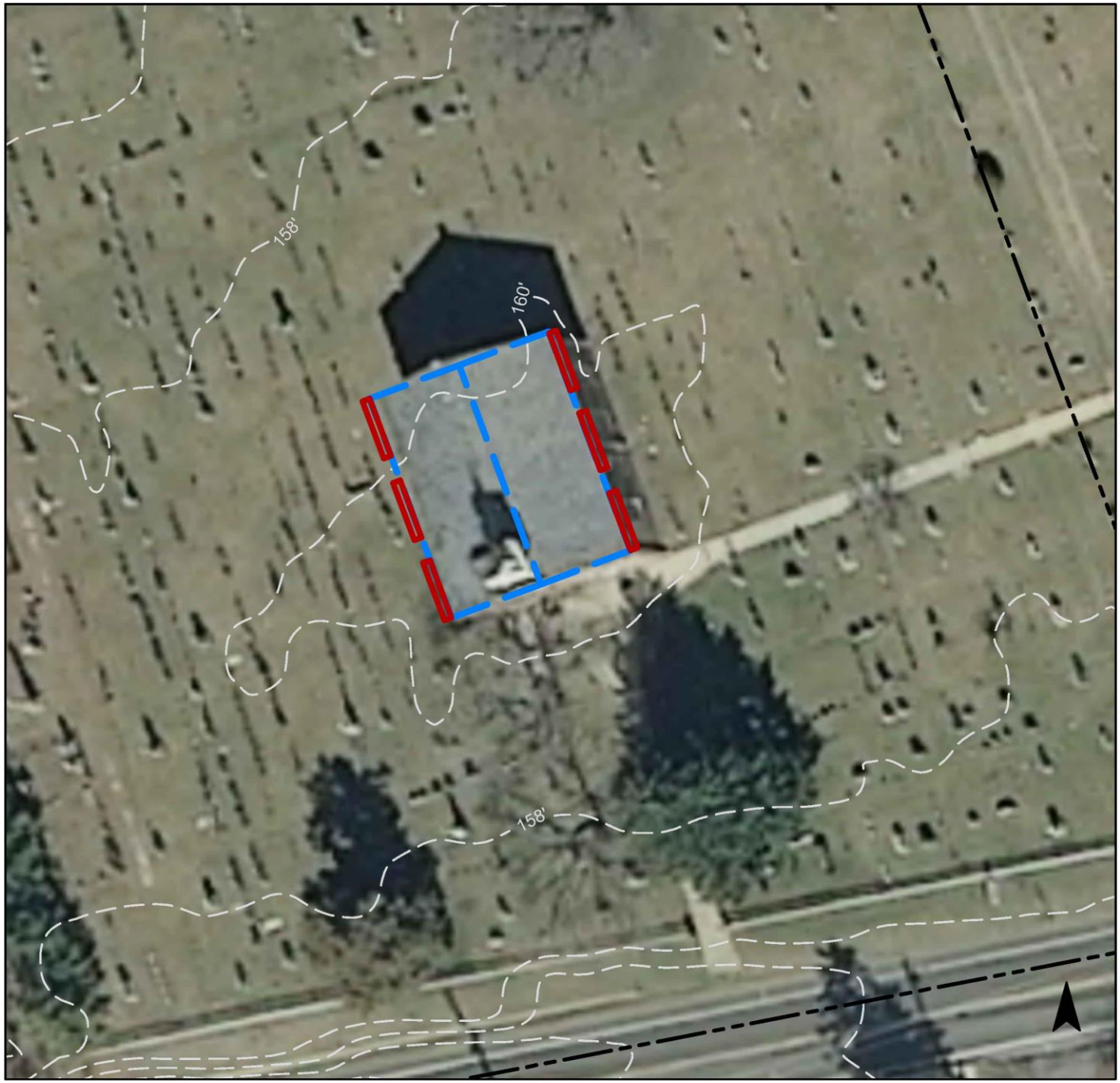
Block and Lot: **Block 159, Lot 13**

Roof runoff currently flows into six disconnected downspouts. Each downspout can be rerouted into planter boxes to reuse this runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
9	8,879	0.4	4.5	40.8	0.007	0.24

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Downspout planter boxes	0.034	5	N/A	N/A	72	$6,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Old Brick Reformed Church

- downspout planter boxes
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 10' 20'

OVERSEAS CHINESE MISSION JIREH CHURCH

Subwatershed: **Big Brook**

Site Area: **436,416 sq. ft.**

Address: **55 Vanderburg Road**
Marlboro, NJ 07746

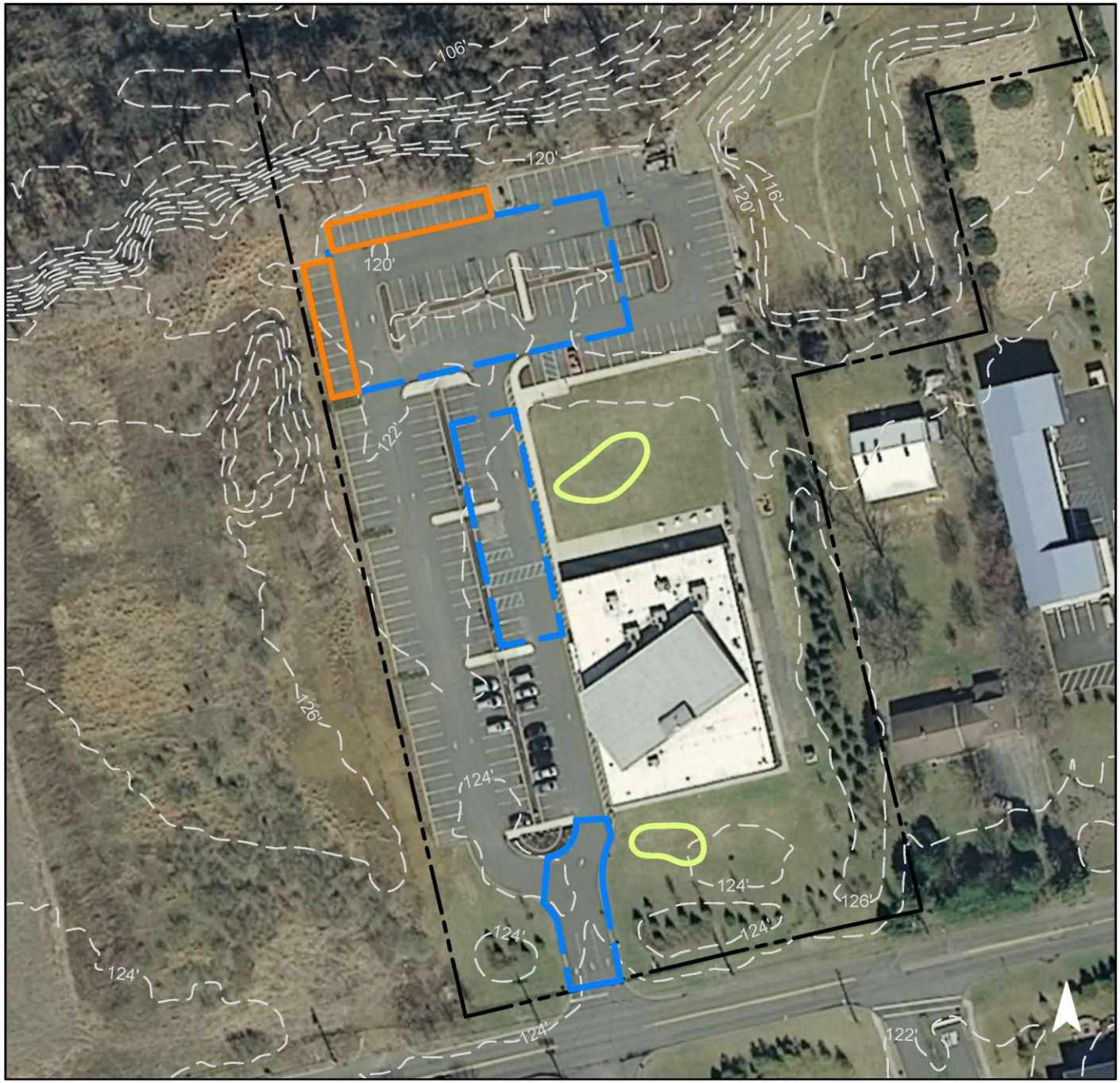
Block and Lot: **Block 214.07, Lot 60**

The building has internal drainage. Parking lot runoff currently flows into storm drains. Bioretention systems can be installed north and south of the facility to capture, treat and infiltrate runoff from the parking lot and driveway. Parking spaces can also be converted into pervious pavement to capture and infiltrate additional stormwater. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
21	93,423	4.5	47.2	428.9	0.073	2.56

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.255	43	193,343	0.73	2,450	$12,250
Pervious pavements	0.441	74	33,406	1.25	3,500	$87,500

GREEN INFRASTRUCTURE RECOMMENDATIONS



Overseas Chinese Mission Jireh Church

- pervious pavements
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

SAINT GABRIEL CHURCH

Subwatershed: **Big Brook**

Site Area: **843,176 sq. ft.**

Address: **100 N Main Street**
Marlboro, NJ 07746

Block and Lot: **Block 213, Lot 10**

This church has several buildings with a mix of connected and disconnected downspouts. The parking lots drain to various catch basins. Runoff appears to flow into a detention basin on site. There are several locations where rain gardens can be installed to capture, treat, and infiltrate runoff from the rooftops as well as from the pavement. Parking spaces can be replaced with porous asphalt to capture additional runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
31	261,823	12.6	132.2	1,202.1	0.204	7.18

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.782	131	59,249	2.22	7,500	$37,500
Pervious pavements	1.893	317	143,399	5.38	14,200	$355,000

GREEN INFRASTRUCTURE RECOMMENDATIONS

Saint Gabriel Church

- disconnected downspouts
- pervious pavements
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 75' 150'

THE GODDARD SCHOOL

Subwatershed: **Big Brook**

Site Area: **439,844 sq. ft.**

Address: **15 School Road**
Marlboro, NJ 07746

Block and Lot: **Block 221, Lot 1**

A bioretention system can be constructed in the front to capture, treat, and infiltrate driveway runoff. Another rain garden can be installed in the back to treat roof runoff by disconnecting two downspouts. Parking spaces can also be replaced with porous asphalt to capture and infiltrate parking lot runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
14	60,823	2.9	30.7	279.3	0.047	1.67

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.151	25	11,444	0.43	1,725	$8,625
Pervious pavements	0.540	90	40,893	1.54	2,975	$74,375

GREEN INFRASTRUCTURE RECOMMENDATIONS

The Goddard School

- disconnected downspouts
- pervious pavements
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

MORGANVILLE INDEPENDENT FIRE COMPANY

Subwatershed: Deep Run

Site Area: 83,070 sq. ft.

Address: 393 NJ Route 79
Marlboro, NJ 07746

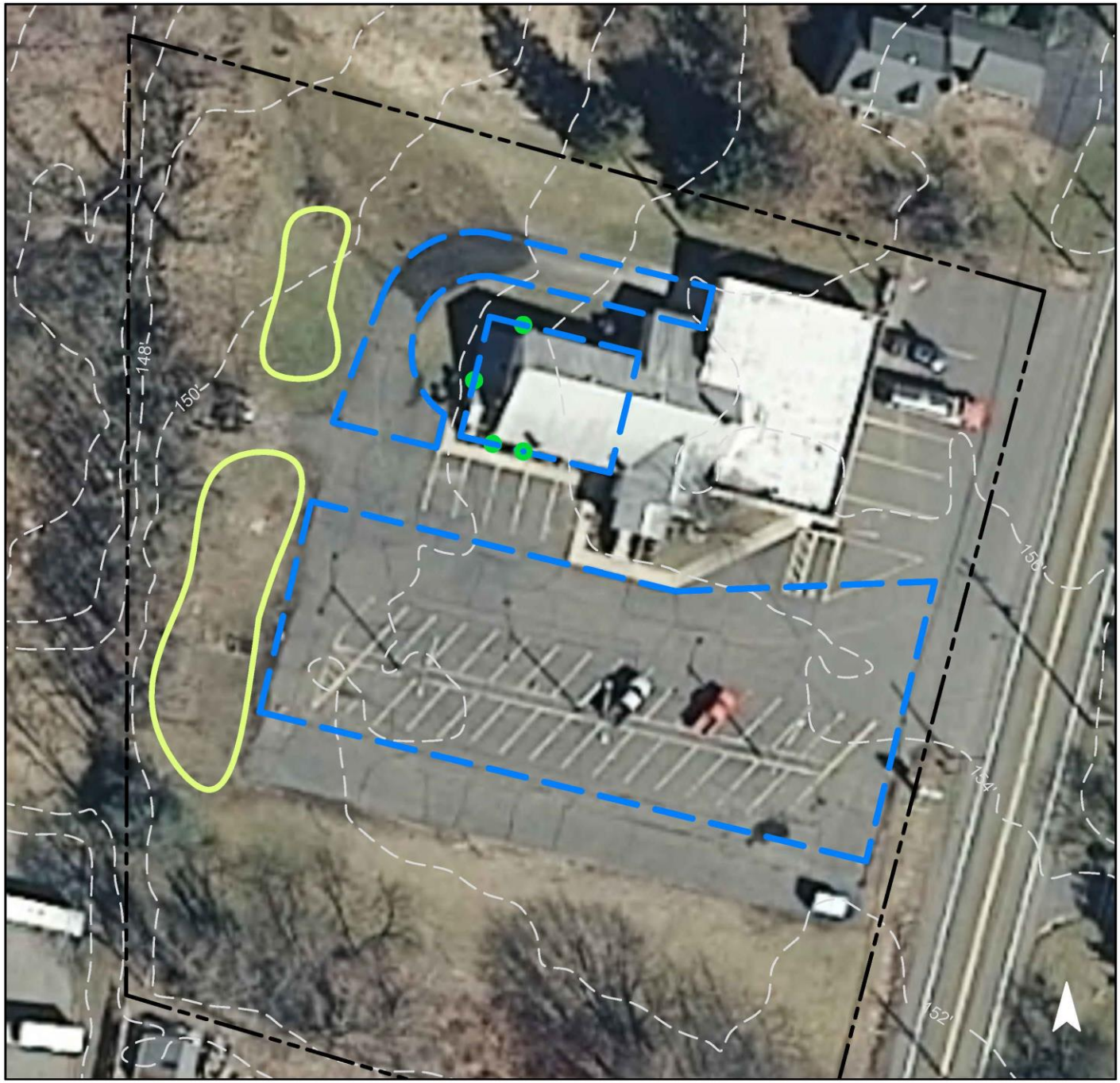
Block and Lot: Block 151, Lot 8

Stormwater from the roof flows into several connected downspouts. The parking lot runoff flows to the west end of the parking lot. Bioretention systems can be installed on the western side of the property to capture, treat, and infiltrate this runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
54	44,458	2.1	22.5	204.1	0.035	1.22

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.522	87	39,524	1.48	4,129	$20,645

GREEN INFRASTRUCTURE RECOMMENDATIONS



Morganville Independent Fire Company

- disconnected downspouts
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 25' 50'

MORGANVILLE UNITED METHODIST

Subwatershed: Deep Run

Site Area: 216,529 sq. ft.

Address: 215 Conover Road
Morganville, NJ 07751

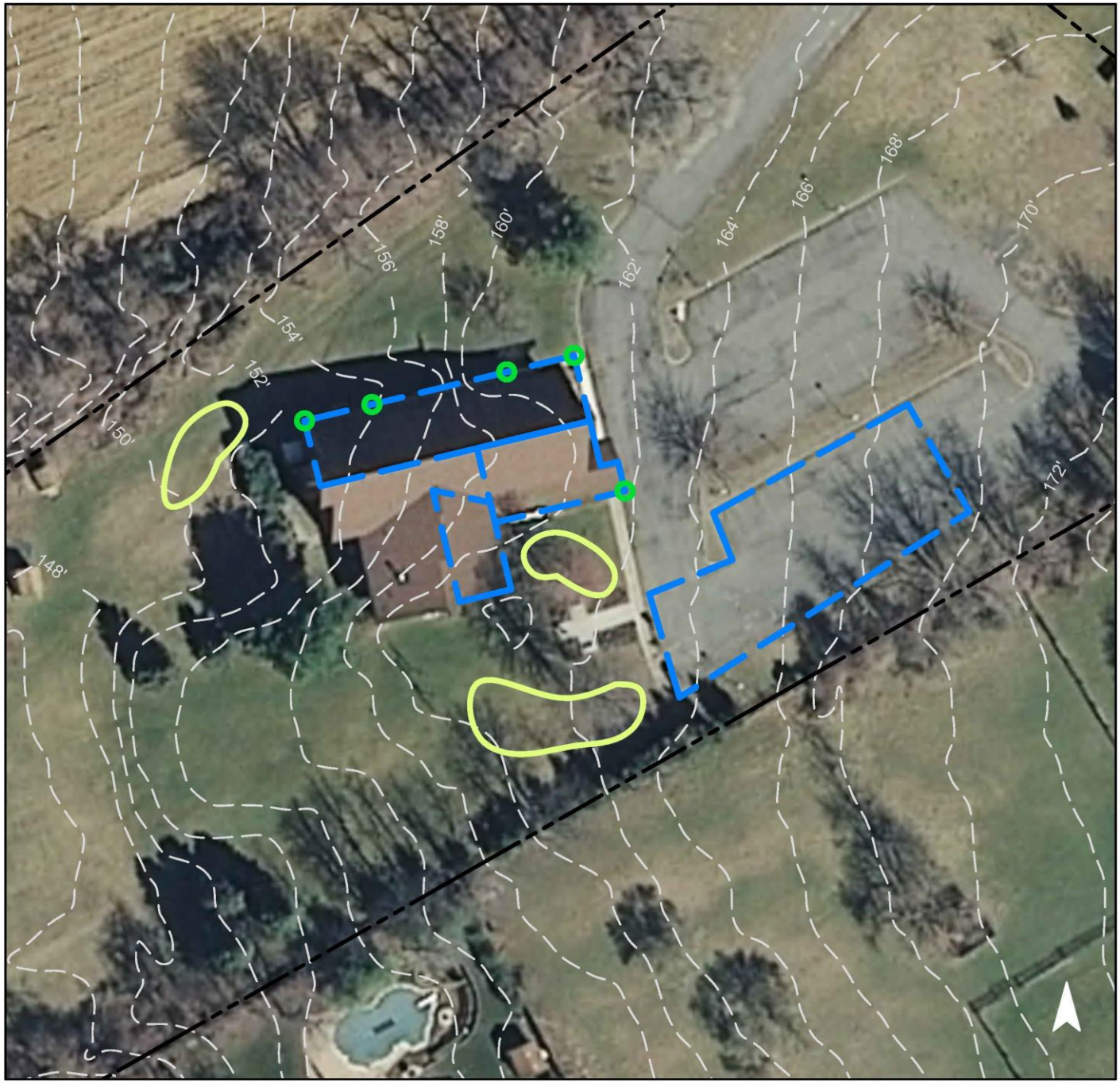
Block and Lot: Block 160.01, Lot 2

There are three locations where rain gardens can be installed to capture, treat, and infiltrate rooftop runoff by disconnecting and redirecting downspouts. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
30	65,954	3.2	33.3	302.8	0.051	1.81

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.291	49	22,029	0.83	2,800	$14,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Morganville United Methodist

- disconnected downspouts
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 30' 60'

ROBERTSVILLE BIBLE CHURCH

Subwatershed: Deep Run

Site Area: 121,054 sq. ft.

Address: 11 Church Road
Morganville, NJ 07751

Block and Lot: Block 267, Lot 46

Rain gardens can be installed to capture, treat, and infiltrate runoff from the roof by redirecting downspouts. Parking spaces can be replaced with pervious pavement to capture and infiltrate stormwater. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
22	26,110	1.3	13.2	119.9	0.020	0.72

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.068	11	5,124	0.19	1,000	$5,000
Pervious pavements	0.211	35	15,955	0.60	3,119	$77,975

GREEN INFRASTRUCTURE RECOMMENDATIONS

Robertsville Bible Church

- pervious pavements
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 20' 40'

ROBERTSVILLE BIBLE PARISH

Subwatershed: Deep Run

Site Area: 38,754 sq. ft.

Address: 11 Church Road, Morganville, NJ 07751

Block and Lot: Block 300.02, Lot 1

Stormwater from the roof flows into directly connected downspouts. Parking lot runoff drains into a forested area to the south. The downspouts on the east and west sides of the building can be disconnected into bioretention systems to allow roof runoff to be captured, treated, and infiltrated. Parking lot runoff can be captured and infiltrated by replacing parking spaces with pervious pavement. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
74	28,574	1.4	14.4	131.2	0.022	0.78

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.141	24	10,696	0.40	1,350	$6,750
Pervious pavements	0.204	34	15,476	0.58	1,700	$42,500

GREEN INFRASTRUCTURE RECOMMENDATIONS

Robertsville Bible Parish

- disconnected downspouts
- pervious pavements
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

US POST OFFICE: ROUTE 79

Subwatershed: Deep Run

Site Area: 20,000 sq. ft.

Address: 248 New Jersey 79
Wickatunk, NJ 07765

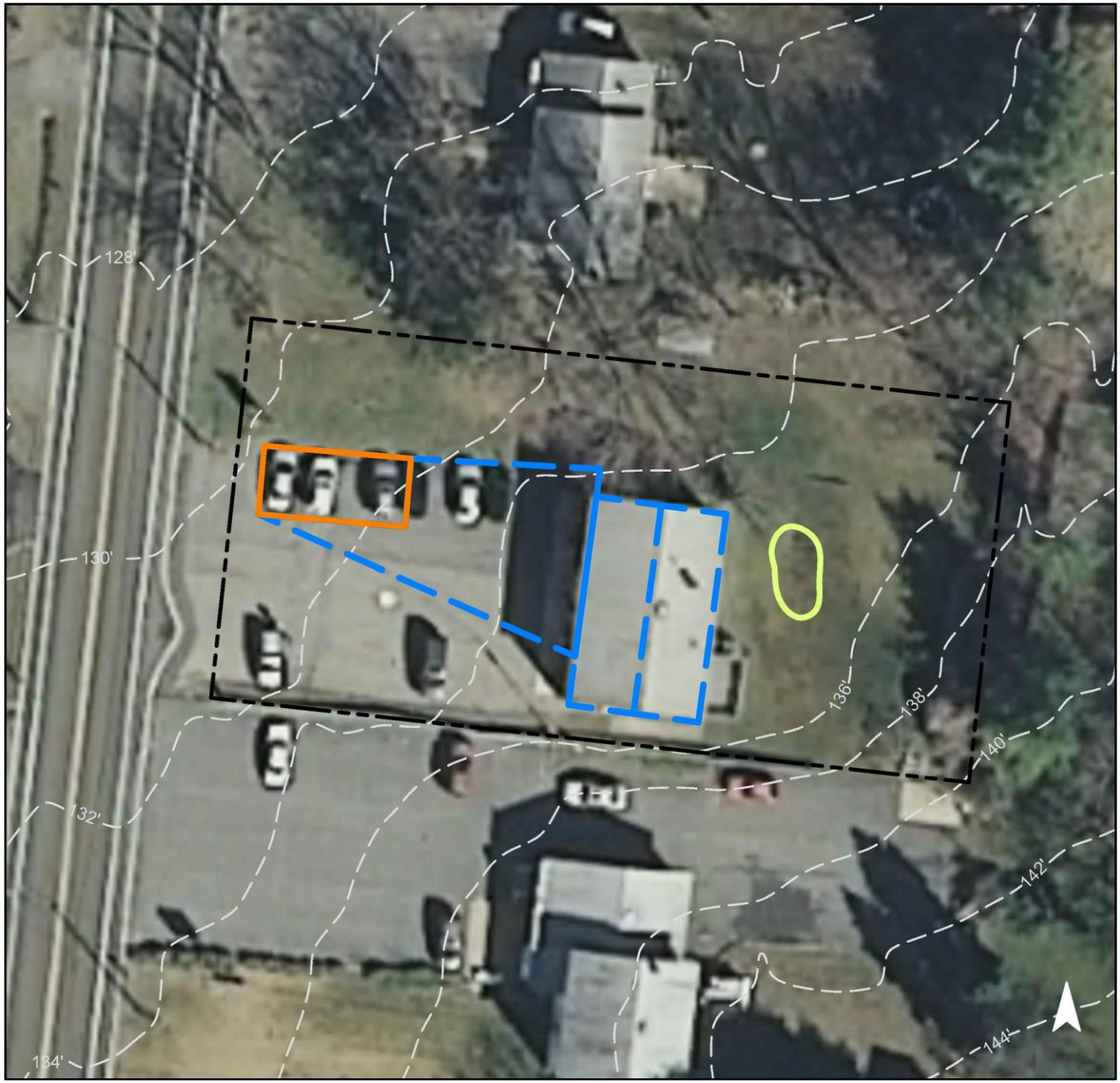
Block and Lot: Block 167, Lot 9

Roof runoff flows through disconnected downspouts into the parking lot, and to the rear of building. Parking spaces can be replaced with pervious pavement to capture parking lot and roof runoff. A rain garden can installed in the rear of the building to capture, treat, and infiltrate roof runoff as well. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
65	12,999	0.6	6.6	59.7	0.010	0.36

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.025	4	1,877	0.07	250	$1,250
Pervious pavements	0.083	14	6,268	0.24	700	$17,500

GREEN INFRASTRUCTURE RECOMMENDATIONS



US Post Office:
Route 79

- pervious pavements
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 20' 40'

US POST OFFICE: TENNENT ROAD

Subwatershed: Deep Run

Site Area: 19,293 sq. ft.

Address: 113 Tennent Road
Morganville, NJ 07751

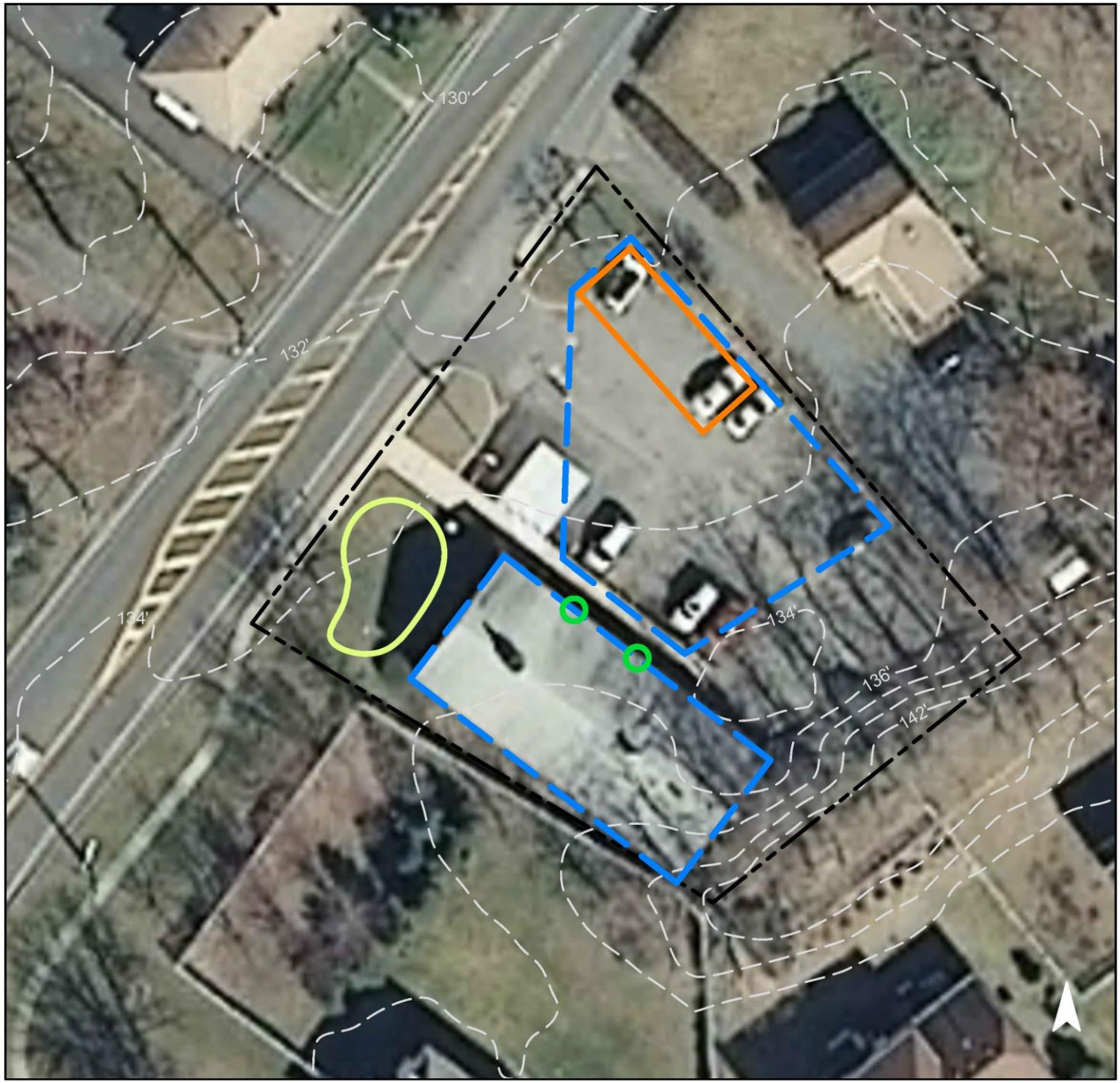
Block and Lot: Block 148, Lot 9

Stormwater flows from the roof into connected downspouts on the north face of the building, and disconnected downspouts on the south face. The parking lot drains into a storm drain in the north corner. Downspouts can be redirected into a bioretention system in front of the building to treat roof runoff. Parking lot runoff can be captured by replacing parking spaces with pervious pavement. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
84	16,244	0.8	8.2	74.6	0.013	0.45

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.093	16	7,024	0.26	890	$4,450
Pervious pavements	0.137	23	10,367	0.39	850	$21,250

GREEN INFRASTRUCTURE RECOMMENDATIONS



US Post Office: Tennent Road

- disconnected downspouts
- pervious pavements
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 20' 40'

COMMERCIAL COMPLEX

Subwatershed: Matawan Creek

Site Area: 132,149 sq. ft.

Address: 479 NJ-79
Marlboro, NJ 07746

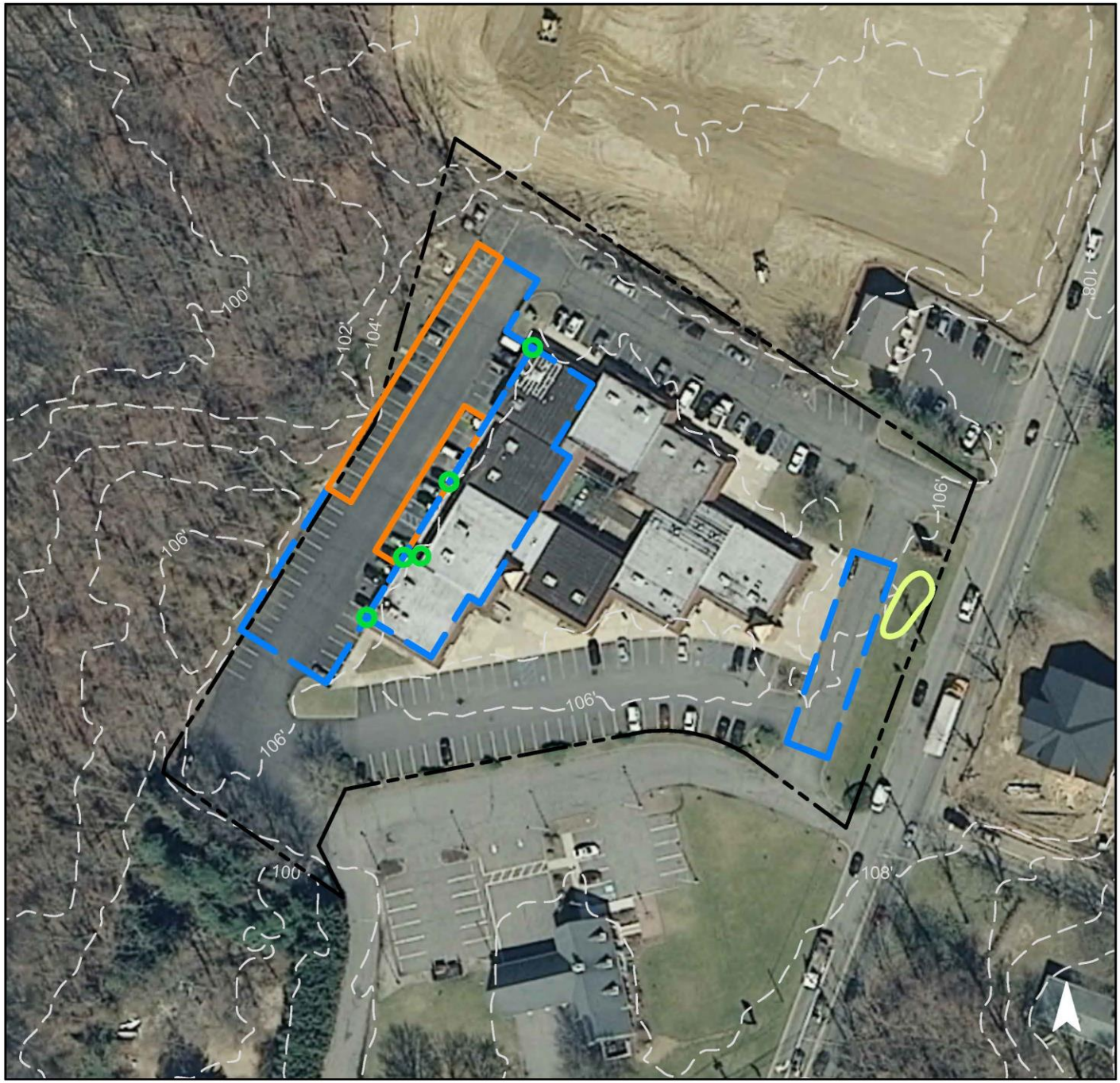
Block and Lot: Block 122, Lot 31

This commercial complex contains several connected downspouts and storm drains that release stormwater into an existing bioswale. A rain garden can be constructed near the road to capture, treat, and infiltrate runoff. Pervious pavement can replace traditional asphalt in parking areas, to capture and infiltrate additional stormwater. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
90	118,520	5.7	59.9	544.2	0.092	3.25

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.099	17	7,532	0.28	700	$3,500
Pervious pavements	0.782	131	59,219	2.22	5,400	$135,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Commercial Complex

- disconnected downspouts
- pervious pavements
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

CONGREGATION OHEV SHALOM: CHAI BUILDING

Subwatershed: McGellairds Brook

Site Area: 447,824 sq. ft.

Address: 46 Topanemus Road
Marlboro, NJ 07746

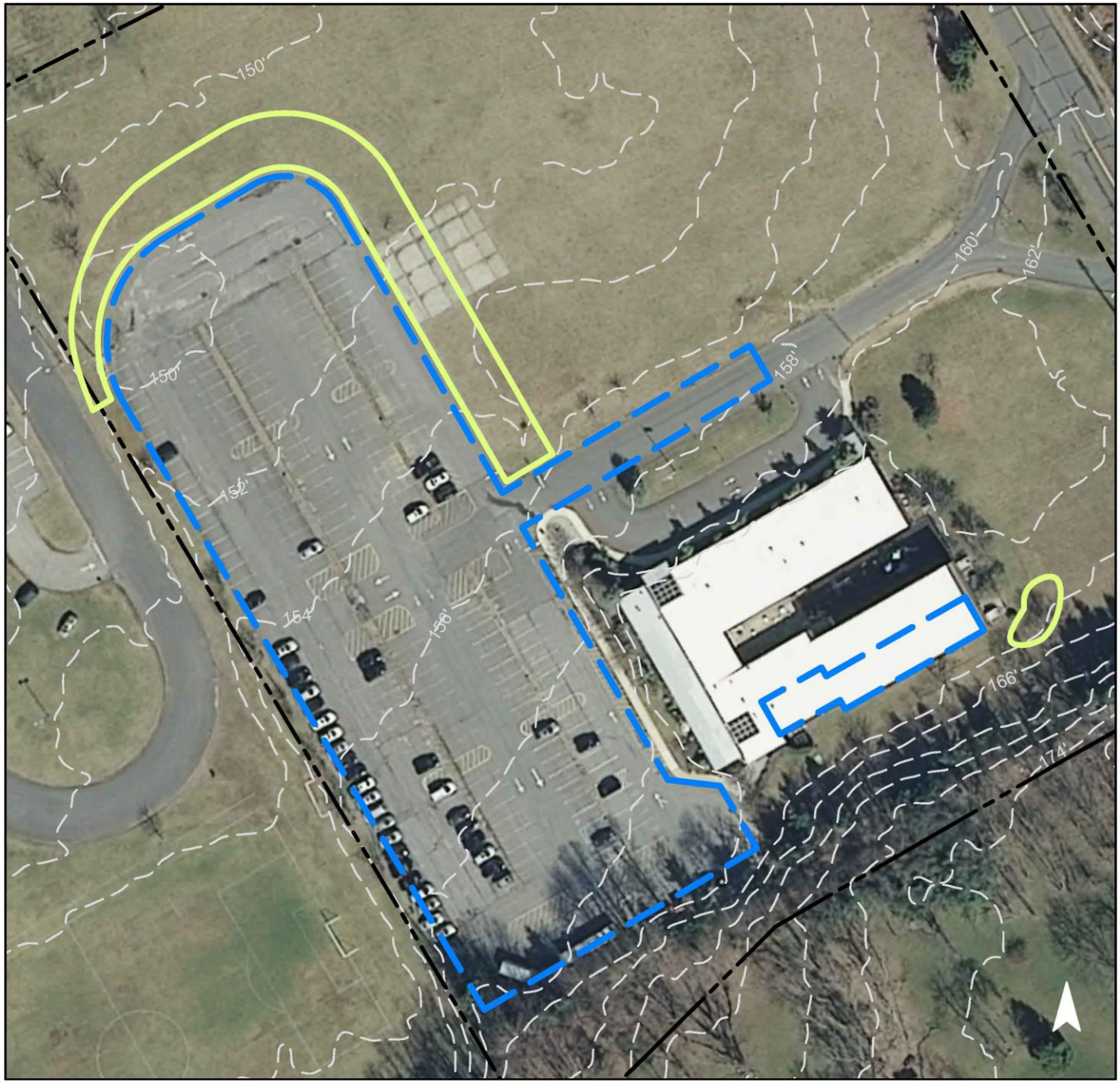
Block and Lot: Block 339, Lot 91

This site has both connected and disconnected downspouts; disconnected downspouts flow onto the grass. The parking lot also flows into the surrounding turf grass. Rain gardens can be installed to capture, treat, and infiltrate this runoff, as well as some roof runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
40	181,345	8.7	91.6	832.6	0.141	4.97

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	2.809	470	212,799	7.99	17,516	$87,580

GREEN INFRASTRUCTURE RECOMMENDATIONS



Congregation Ohev Shalom: Chai Building

- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

MARLBORO FREE PUBLIC LIBRARY

Subwatershed: McGellairds Brook

Site Area: 181,474 sq. ft.

Address: 1 Library Court
Marlboro, NJ 07746

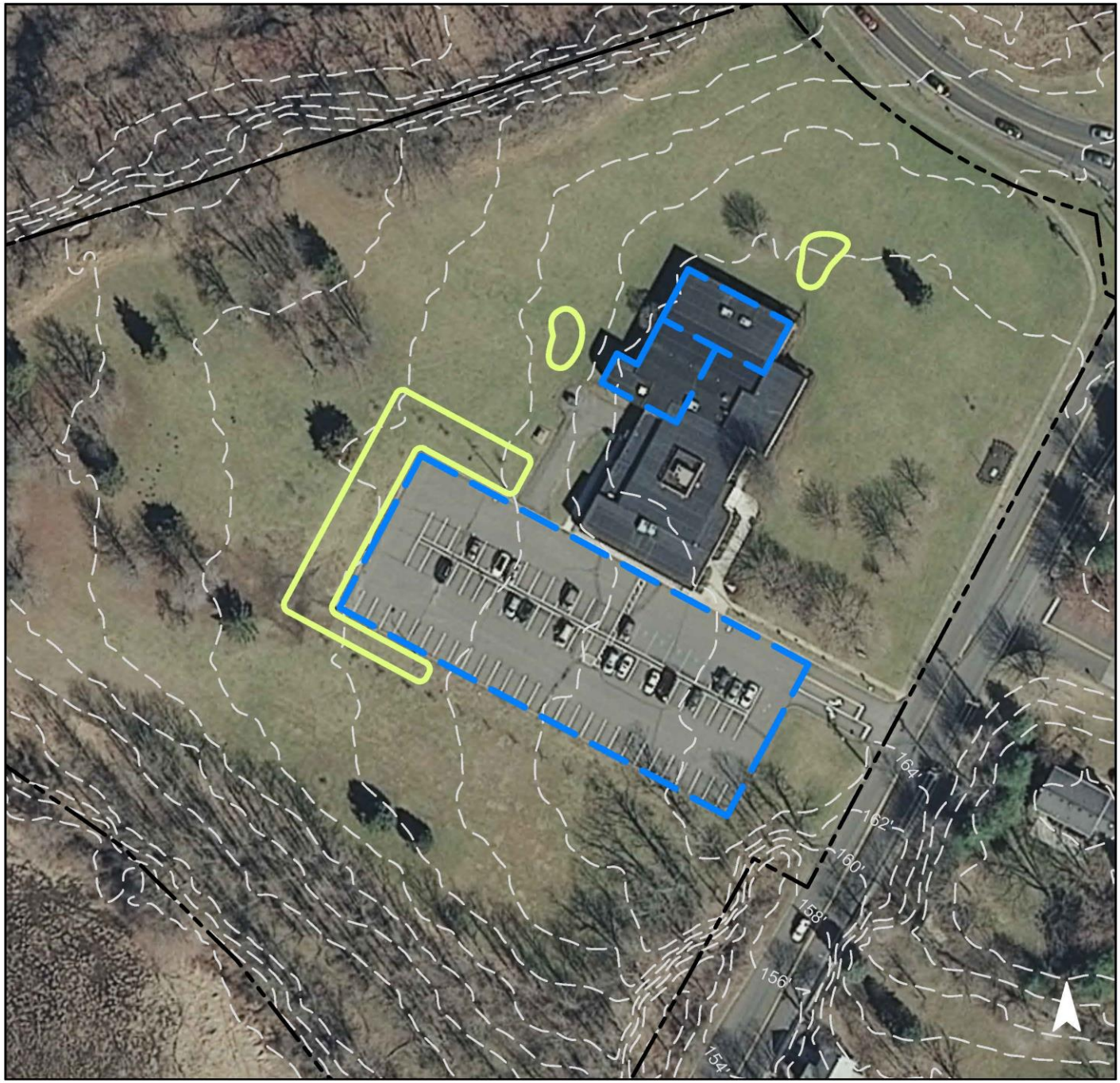
Block and Lot: Block 253, Lot 35.02

This library's parking lot drains into a turf grass field. Rain gardens can capture, treat, and infiltrate this runoff, as well as some of the buildings rooftop runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
35	63,696	3.1	32.2	295.5	0.050	1.75

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.988	165	74,852	2.81	9,031	$45,155

GREEN INFRASTRUCTURE RECOMMENDATIONS



Marlboro Free Public Library

- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

MARLBORO MUNICIPAL COURT & DPW

Subwatershed: McGellairds Brook

Site Area: 763,268 sq. ft.

Address: 1979 Township Drive
Marlboro, NJ 07746

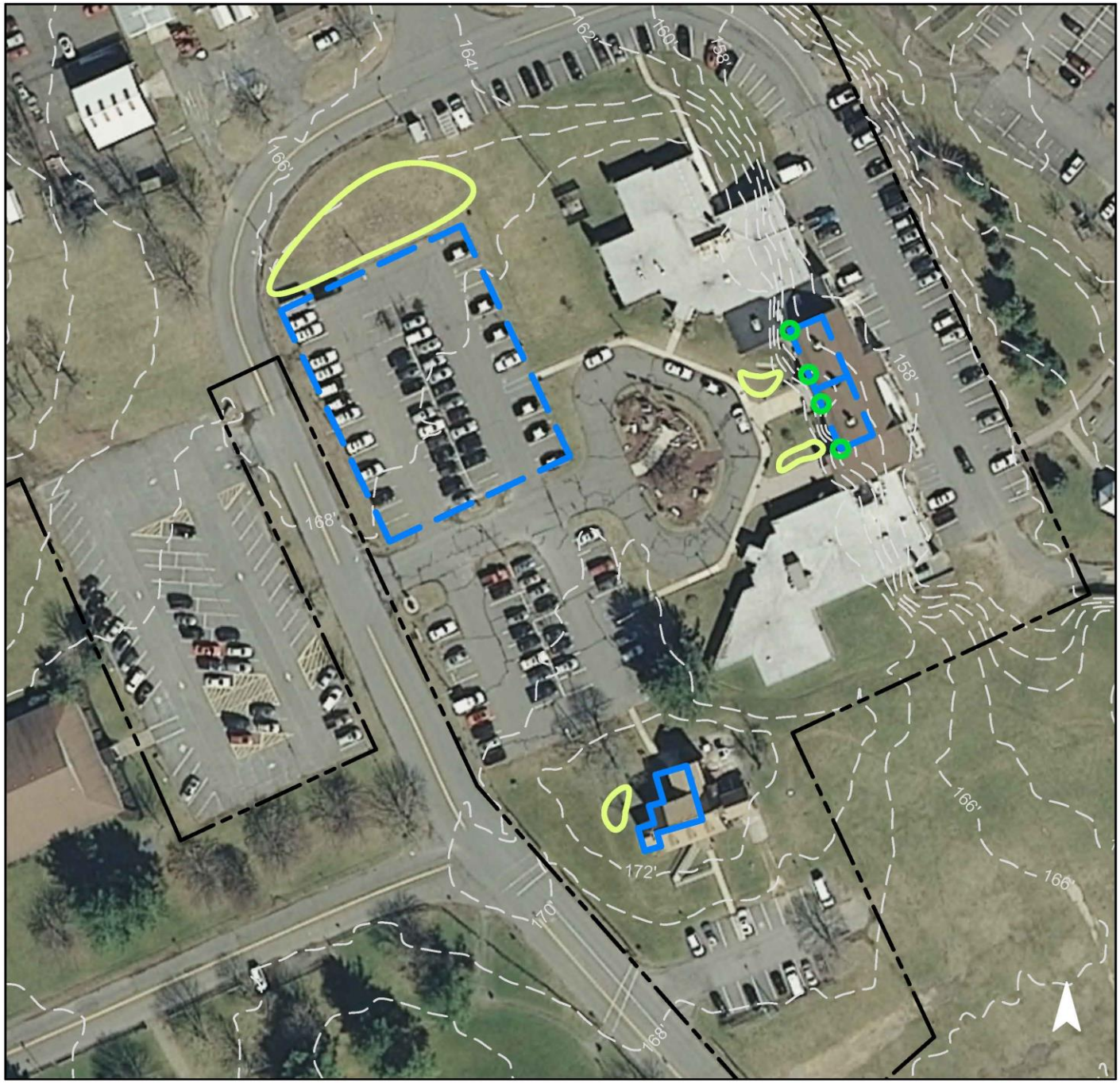
Block and Lot: Block 253, Lot 37.01

Several buildings have either connected downspouts or internal drainage. One building has disconnected downspouts that releases runoff onto the grass. Bioretention systems can be installed to capture, treat, and infiltrate both roof and parking lot runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
55	417,068	20.1	210.6	1,914.9	0.325	11.44

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.650	109	49,256	1.85	6,116	$30,580

GREEN INFRASTRUCTURE RECOMMENDATIONS



Marlboro Municipal Court & DPW

- disconnected downspouts
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

MARLBORO RECREATION CENTER

Subwatershed: McGellairds Brook

Site Area: 2,812,956 sq. ft.

Address: 1996 Recreation Way
Marlboro, NJ 07746

Block and Lot: Block 253, Lot 36.02

The recreation center's parking lot drains to the north. Parking spaces can be converted into pervious pavement to capture and infiltrate this runoff. The building already has disconnected downspouts that flow onto the grass and then into catch basins. Rain gardens can be installed to capture, treat and infiltrate this runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
7	190,231	9.2	96.1	873.4	0.148	5.22

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.120	20	9,081	0.34	1,150	$5,750
Pervious pavements	1.692	283	128,155	4.81	10,378	$259,450

GREEN INFRASTRUCTURE RECOMMENDATIONS

Marlboro Recreation Center

- pervious pavements
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

SOLOMON SCHECHTER DAY SCHOOL

Subwatershed: McGellairds Brook

Site Area: 122,380 sq. ft.

Address: 22 School Road
Marlboro, NJ 07746

Block and Lot: Block 355, Lot 5

Rain gardens can be constructed at several locations to capture, treat, and infiltrate roof runoff. An additional rain garden can be installed to manage runoff from the driveway. A row of parking spaces can be replaced with pervious pavement to capture and infiltrate parking lot runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
73	89,346	4.3	45.1	410.2	0.070	2.45

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.136	23	10,307	0.39	1,300	$6,500
Pervious pavements	0.324	54	24,572	0.92	1,900	$47,500

GREEN INFRASTRUCTURE RECOMMENDATIONS

Solomon Schechter Day School

- pervious pavements
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

US POST OFFICE: MAIN STREET COMPLEX

Subwatershed: McGellairds Brook

Site Area: 345,464 sq. ft.

Address: 8 South Main Street # 1
Marlboro, NJ 07746

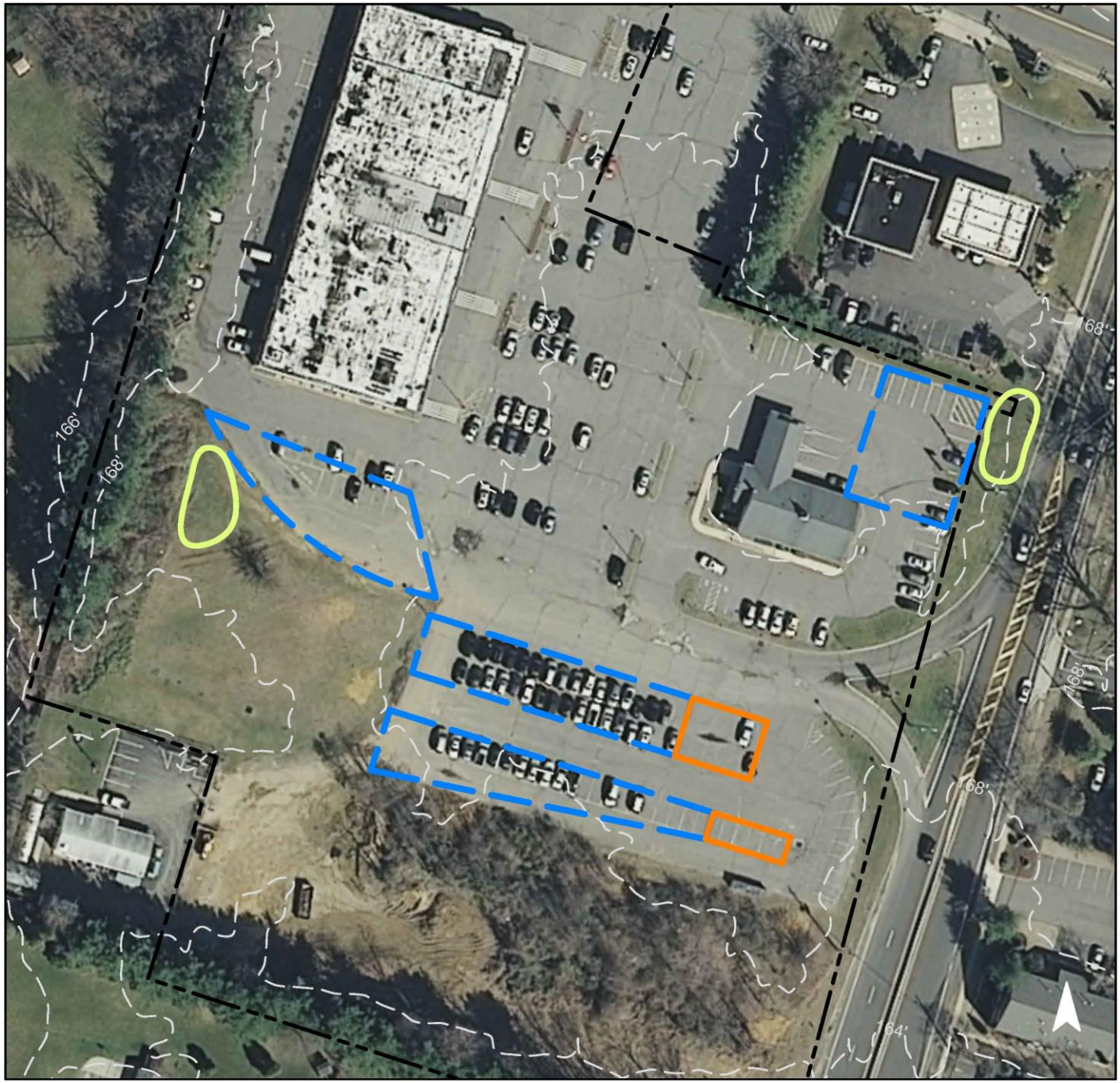
Block and Lot: Block 351, Lot 3

Stormwater from the roof flows through disconnected downspouts onto the pavement. Rain gardens can be constructed at two locations to capture, treat, and infiltrate parking lot runoff. Parking spaces can also be replaced with pervious pavement to capture and infiltrate additional stormwater. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
63	218,758	10.5	110.5	1,004.4	0.170	6.00

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.339	57	25,664	0.96	3,250	$16,250
Pervious pavements	0.358	60	27,085	1.02	3,000	$75,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



US Post Office: Main Street Complex

- pervious pavements
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

d. Summary of Existing Conditions

Summary of Existing Site Conditions

Subwatershed/Site Name/Total Site Info/GI Practice	Area (ac)	Area (SF)	Block	Lot	Existing Annual Loads TP (lb/yr)	Existing Annual Loads TN (lb/yr)	Existing Annual Loads TSS (lb/yr)	I.C. %	I.C. Area (ac)	I.C. Area (SF)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (Mgal)	Runoff Volumes from I.C. Annual (Mgal)
BIG BROOK SUBWATERSHED	**122.15**	**5,320,862**			**78.8**	**826.0**	**7,509.4**		**37.55**	**1,635,547**	**1.274**	**44.86**
Gordon's Corner Water Company												
Total Site Info	2.60	113,346	214.07	64.01	2.5	26.7	242.3	47	1.21	52,777	0.041	1.45
Marlboro High School												
Total Site Info	48.82	2,126,645	225	199	31.3	327.8	2,980.3	31	14.90	649,107	0.506	17.80
Marlboro Jewish Center Nursery School												
Total Site Info	5.38	234,220	322	20	5.2	54.9	498.7	46	2.49	108,619	0.085	2.98
Monmouth Worship Center												
Total Site Info	13.55	590,421	214.07	61.01	9.7	101.4	921.7	34	4.61	200,752	0.156	5.51
New Hope Foundation: Discovery Instititute												
Total Site Info	10.00	435,486	157	34.02	9.6	100.7	915.3	46	4.58	199,343	0.155	5.47
Old Brick Reformed Church												
Total Site Info	2.33	101,307	159	13	0.4	4.5	40.8	9	0.20	8,879	0.007	0.24
Overseas Chinese Mission Jireh Church												
Total Site Info	10.02	436,416	214.07	60	4.5	47.2	428.9	21	2.14	93,423	0.073	2.56
Saint Gabriel Church												
Total Site Info	19.36	843,176	213	10	12.6	132.2	1,202.1	31	6.01	261,823	0.204	7.18
The Goddard School												
Total Site Info	10.10	439,844	221	1	2.9	30.7	279.3	14	1.40	60,823	0.047	1.67
DEEP RUN SUBWATERSHED	**11.45**	**498,700**			**9.4**	**98.2**	**892.3**		**4.46**	**194,339**	**0.151**	**5.33**
Morganville Independent Fire Company												
Total Site Info	1.91	83,070	151	8	2.1	22.5	204.1	54	1.02	44,458	0.035	1.22
Morganville United Methodist												
Total Site Info	4.97	216,529	160.01	2	3.2	33.3	302.8	30	1.51	65,954	0.051	1.81

Summary of Existing Site Conditions

Subwatershed/Site Name/Total Site Info/GI Practice	Area (ac)	Area (SF)	Block	Lot	Existing Annual Loads TP (lb/yr)	Existing Annual Loads TN (lb/yr)	Existing Annual Loads TSS (lb/yr)	I.C. %	I.C. Area (ac)	I.C. Area (SF)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (Mgal)	Runoff Volumes from I.C. Annual (Mgal)
Robertsville Bible Church												
Total Site Info	2.78	121,054	267	46	1.3	13.2	119.9	22	0.60	26,110	0.020	0.72
Robertsville Bible Parish												
Total Site Info	0.89	38,754	300.02	1	1.4	14.4	131.2	74	0.66	28,574	0.022	0.78
US Post Office: Route 79												
Total Site Info	0.46	20,000	167	9	0.6	6.6	59.7	65	0.30	12,999	0.010	0.36
US Post Office - Tennent Rd												
Total Site Info	0.44	19,293	148	9	0.8	8.2	74.6	84	0.37	16,244	0.013	0.45
MATAWAN CREEK SUBWATERSHED	**3.03**	**132,149**			**5.7**	**59.9**	**544.2**		**2.72**	**118,520**	**0.092**	**3.25**
Commercial Complex												
Total Site Info	3.03	132,149	122	31	5.7	59.9	544.2	90	2.72	118,520	0.092	3.25
MCGELLAIRDS BROOK SUBWATERSHED	**107.29**	**4,673,367**			**55.9**	**586.1**	**5,328.0**		**26.64**	**1,160,444**	**0.904**	**31.83**
Congregation Ohev Shalom: Chai Building												
Total Site Info	10.28	447,824	339	91	8.7	91.6	832.6	40	4.16	181,345	0.141	4.97
Marlboro Free Public Library												
Total Site Info	4.17	181,474	253	35.02	3.1	32.2	292.5	35	1.46	63,696	0.050	1.75
Marlboro Municipal Court & DPW												
Total Site Info	17.52	763,268	253	37.01	20.1	210.6	1,914.9	55	9.57	417,068	0.325	11.44
Marlboro Recreation Center												
Total Site Info	64.58	2,812,956	253	36.02	9.2	96.1	873.4	7	4.37	190,231	0.148	5.22
Solomon Schechter Day School												
Total Site Info	2.81	122,380	355	5	4.3	45.1	410.2	73	2.05	89,346	0.070	2.45

Summary of Existing Site Conditions

Subwatershed/Site Name/Total Site Info/GI Practice	Area (ac)	Area (SF)	Block	Lot	Existing Annual Loads TP (lb/yr)	Existing Annual Loads TN (lb/yr)	Existing Annual Loads TSS (lb/yr)	I.C. %	I.C. Area (ac)	I.C. Area (SF)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (Mgal)	Runoff Volumes from I.C. Annual (Mgal)
US Post Office: Main Street Complex												
Total Site Info	7.93	345,464	351	3	10.5	110.5	1,004.4	63	5.02	218,758	0.170	6.00

e. Summary of Proposed Green Infrastructure Practices

Summary of Proposed Green Infrastructure Practices

	Subwatershed/Site Name/Total Site Info/GI Practice	Potential Management Area Area (SF)	Potential Management Area Area (ac)	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Max Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cfs)	Size of BMP (SF)	Unit Cost ($)	Unit	Total Cost ($)	I.C. Treated %
	BIG BROOK SUBWATERSHED	**289,677**	**6.65**	**7.548**	**1,263**	**743,272**	**21.37**	**56,462**			**$1,050,850**	**17.7%**
1	**Gordon's Corner Water Company**											
	Bioretention systems/rain gardens	3,270	0.08	0.085	14	6,455	0.24	820	5	SF	$4,100	6.2%
	Pervious pavements	17,269	0.40	0.450	75	34,086	1.28	2,500	25	SF	$62,500	32.7%
	Total Site Info	**20,539**	**0.47**	**0.535**	**90**	**40,541**	**1.52**	**3,320**			**$66,600**	**38.9%**
2	**Marlboro High School**											
	Bioretention systems/rain gardens	1,700	0.04	0.044	7	3,359	0.13	285	5	SF	$1,425	0.3%
	Pervious pavements	42,906	0.98	1.118	187	84,696	3.18	6,870	25	SF	$171,750	6.6%
	Total Site Info	**44,606**	**1.02**	**1.162**	**195**	**88,055**	**3.31**	**7,155**			**$173,175**	**6.9%**
3	**Marlboro Jewish Center Nursery School**											
	Bioretention systems/rain garden	4,395	0.10	0.115	19	8,677	0.33	1,465	5	SF	$7,325	4.0%
	Pervious pavements	37,120	0.85	0.967	162	73,274	2.75	6,000	25	SF	$150,000	34.2%
	Total Site Info	**41,515**	**0.95**	**1.082**	**181**	**81,951**	**3.08**	**7,465**			**$157,325**	**38.2%**
4	**Monmouth Worship Center**											
	Bioretention systems/rain gardens	8,000	0.18	0.208	35	15,790	0.59	2,000	5	SF	$10,000	4.0%
	Total Site Info	**8,000**	**0.18**	**0.208**	**35**	**15,790**	**0.59**	**2,000**			**$10,000**	**4.0%**
5	**New Hope Foundation: Discovery Institute**											
	Bioretention systems/rain gardens	8,000	0.18	0.208	35	15,790	0.59	2,000	5	SF	$10,000	4.0%
	Pervious pavements	9,832	0.23	0.256	43	19,411	0.73	2,100	25	SF	$52,500	4.9%
	Total Site Info	**17,832**	**0.41**	**0.465**	**78**	**35,201**	**1.32**	**4,100**			**$62,500**	**8.9%**
6	**Old Brick Reformed Church**											
	Downspout planter boxes	1,290	0.03	0.034	5	N/A	N/A	72	1000	box	$6,000	14.5%
	Total Site Info	**1,290**	**0.03**	**0.034**	**5**			**72**			**$6,000**	**14.5%**
7	**Overseas Chinese Mission Jireh Church**											
	Bioretention systems/rain gardens	9,800	0.22	0.255	43	193,343	0.73	2,450	5	SF	$12,250	10.5%
	Pervious pavements	16,922	0.39	0.441	74	33,406	1.25	3,500	25	SF	$87,500	18.1%
	Total Site Info	**26,722**	**0.61**	**0.696**	**117**	**226,749**	**1.98**	**5,950**			**$99,750**	**28.6%**

Summary of Proposed Green Infrastructure Practices

	Subwatershed/Site Name/Total Site Info/GI Practice	Potential Management Area Area (SF)	Potential Management Area Area (ac)	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Max Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cfs)	Size of BMP (SF)	Unit Cost ($)	Unit	Total Cost ($)	I.C. Treated %
8	**Saint Gabriel Church**											
	Bioretention systems/rain gardens	30,015	0.69	0.782	131	59,249	2.22	7,500	5	SF	$37,500	11.5%
	Pervious pavements	72,644	1.67	1.893	317	143,399	5.38	14,200	25	SF	$355,000	27.7%
	Total Site Info	**102,659**	**2.36**	**2.675**	**448**	**202,648**	**7.60**	**21,700**			**$392,500**	**39.2%**
9	**The Goddard School**											
	Bioretention systems/rain gardens	5,796	0.13	0.151	25	11,444	0.43	1,725	5	SF	$8,625	9.5%
	Pervious pavements	20,718	0.48	0.540	90	40,893	1.54	2,975	25	SF	$74,375	34.1%
	Total Site Info	**26,514**	**0.61**	**0.691**	**116**	**52,337**	**1.97**	**4,700**			**$83,000**	**43.6%**
	DEEP RUN SUBWATERSHED	**68,057**	**1.56**	**1.773**	**297**	**134,340**	**5.04**	**16,788**			**$211,320**	**35.0%**
10	**Morganville Independent Fire Company**											
	Bioretention systems/rain gardens	20,023	0.46	0.522	87	39,524	1.48	4,129	5	SF	$20,645	45.0%
	Total Site Info	**20,023**	**0.46**	**0.522**	**87**	**39,524**	**1.48**	**4,129**			**$20,645**	**45.0%**
11	**Morganville United Methodist**											
	Bioretention systems/rain gardens	11,160	0.26	0.291	49	22,029	0.83	2,800	5	SF	$14,000	16.9%
	Total Site Info	**11,160**	**0.26**	**0.291**	**49**	**22,029**	**0.83**	**2,800**			**$14,000**	**16.9%**
12	**Robertsville Bible Church**											
	Bioretention systems/rain gardens	2,596	0.06	0.068	11	5,124	0.19	1,000	5	SF	$5,000	9.9%
	Pervious pavements	8,082	0.19	0.211	35	15,955	0.60	3,119	25	SF	$77,975	31.0%
	Total Site Info	**10,678**	**0.25**	**0.278**	**47**	**21,079**	**0.79**	**4,119**			**$82,975**	**40.9%**
13	**Robertsville Bible Parish**											
	Bioretention systems/rain gardens	5,420	0.12	0.141	24	10,696	0.40	1,350	5	SF	$6,750	19.0%
	Pervious pavements	7,840	0.18	0.204	34	15,476	0.58	1,700	25	SF	$42,500	27.4%
	Total Site Info	**13,260**	**0.30**	**0.345**	**58**	**26,172**	**0.98**	**3,050**			**$49,250**	**46.4%**
14	**US Post Office: Route 79**											
	Bioretention systems/rain gardens	950	0.02	0.025	4	1,877	0.07	250	5	SF	$1,250	7.3%
	Pervious pavements	3,174	0.07	0.083	14	6,268	0.24	700	25	SF	$17,500	24.4%
	Total Site Info	**4,124**	**0.09**	**0.107**	**18**	**8,145**	**0.31**	**950**			**$18,750**	**31.7%**

Summary of Proposed Green Infrastructure Practices

	Subwatershed/Site Name/Total Site Info/GI Practice	Potential Management Area Area (SF)	Potential Management Area Area (ac)	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Max Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cfs)	Size of BMP (SF)	Unit Cost ($)	Unit	Total Cost ($)	I.C. Treated %
15	**US Post Office: Tennent Rd**											
	Bioretention systems/rain gardens	3,560	0.08	0.093	16	7,024	0.26	890	5	SF	$4,450	21.9%
	Pervious pavements	5,252	0.12	0.137	23	10,367	0.39	850	25	SF	$21,250	32.3%
	Total Site Info	**8,812**	**0.20**	**0.230**	**38**	**17,391**	**0.65**	**1,740**			**$25,700**	**54.2%**
	MATAWAN CREEK SUBWATERSHED	**33,817**	**0.78**	**0.881**	**148**	**66,751**	**2.50**	**6,100**			**$138,500**	**28.5%**
16	**Commercial Complex**											
	Bioretention systems/rain gardens	3,817	0.09	0.099	17	7,532	0.28	700	5	SF	$3,500	3.2%
	Pervious pavements	30,000	0.69	0.782	131	59,219	2.22	5,400	25	SF	$135,000	25.3%
	Total Site Info	**33,817**	**0.78**	**0.881**	**148**	**66,751**	**2.50**	**6,100**			**$138,500**	**28.5%**
	MCGELLAIRDS BROOK SUBWATERSHED	**284,587**	**6.53**	**7.415**	**1,241**	**561,771**	**21.09**	**53,641**			**$573,765**	**24.5%**
17	**Congregation Ohev Shalom: Chai Building**											
	Bioretention systems/rain gardens	107,803	2.47	2.809	470	212,799	7.99	17,516	5	SF	$87,580	59.4%
	Total Site Info	**107,803**	**2.47**	**2.809**	**470**	**212,799**	**7.99**	**17,516**			**$87,580**	**59.4%**
18	**Marlboro Free Public Library**											
	Bioretention systems/rain gardens	37,919	0.87	0.988	165	74,852	2.81	9,031	5	SF	$45,155	59.5%
	Total Site Info	**37,919**	**0.87**	**0.988**	**165**	**74,852**	**2.81**	**9,031**			**$45,155**	**59.5%**
19	**Marlboro Municipal Court & DPW**											
	Bioretention systems/rain gardens	24,953	0.57	0.650	109	49,256	1.85	6,116	5	SF	$30,580	6.0%
	Total Site Info	**24,953**	**0.57**	**0.650**	**109**	**49,256**	**1.85**	**6,116**			**$30,580**	**6.0%**
20	**Marlboro Recreation Center**											
	Bioretention systems/rain gardens	4,600	0.11	0.120	20	9,081	0.34	1,150	5	SF	$5,750	2.4%
	Pervious pavements	64,923	1.49	1.692	283	128,155	4.81	10,378	25	SF	$259,450	34.1%
	Total Site Info	**69,523**	**1.60**	**1.811**	**303**	**137,236**	**5.15**	**11,528**			**$265,200**	**36.5%**
21	**Solomon Schechter Day School**											
	Bioretention systems/rain gardens	5,220	0.12	0.136	23	10,307	0.39	1,300	5	SF	$6,500	5.8%
	Pervious pavements	12,448	0.29	0.324	54	24,572	0.92	1,900	25	SF	$47,500	12.0%
	Total Site Info	**17,668**	**0.41**	**0.460**	**77**	**34,879**	**1.31**	**3,200**			**$54,000**	**17.9%**

Summary of Proposed Green Infrastructure Practices

	Subwatershed/Site Name/Total Site Info/GI Practice	Potential Management Area Area (SF)	Potential Management Area Area (ac)	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Max Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cfs)	Size of BMP (SF)	Unit Cost ($)	Unit	Total Cost ($)	I.C. Treated %
22	**US Post Office: Main Street Complex**											
	Bioretention systems/rain gardens	13,000	0.30	0.339	57	25,664	0.96	3,250	5	SF	$16,250	5.9%
	Pervious pavements	13,721	0.31	0.358	60	27,085	1.02	3,000	25	SF	$75,000	7.6%
	Total Site Info	**26,721**	**0.61**	**0.696**	**117**	**52,749**	**1.98**	**6,250**			**$91,250**	**13.6%**