RUTGERS
New Jersey Agricultural
Experiment Station

Impervious Cover Reduction Action Plan
for
Fairfield Township, Cumberland County, New Jersey

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

November 3, 2016

WILLIAM PENN
FOUNDATION

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Introduction

Located in Cumberland County in southern New Jersey, Fairfield Township covers approximately 43.5 square miles. Figures 1 and 2 illustrate that Fairfield Township is dominated by wetland land uses. A total of 8.4% of the municipality's land use is classified as urban. Of the urban land in Fairfield Township, rural residential is the dominant land use (Figure 3).

The New Jersey Department of Environmental Protection's (NJDEP) 2012 land use/land cover geographical information system (GIS) data layer categorizes Fairfield 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 Fairfield Township. Based upon the 2012 NJDEP land use/land cover data, approximately 1.7% of Fairfield Township has impervious cover. This level of impervious cover suggests that the streams in Fairfield Township are likely sensitive streams. [1]

Methodology

Fairfield Township contains portions of nine 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

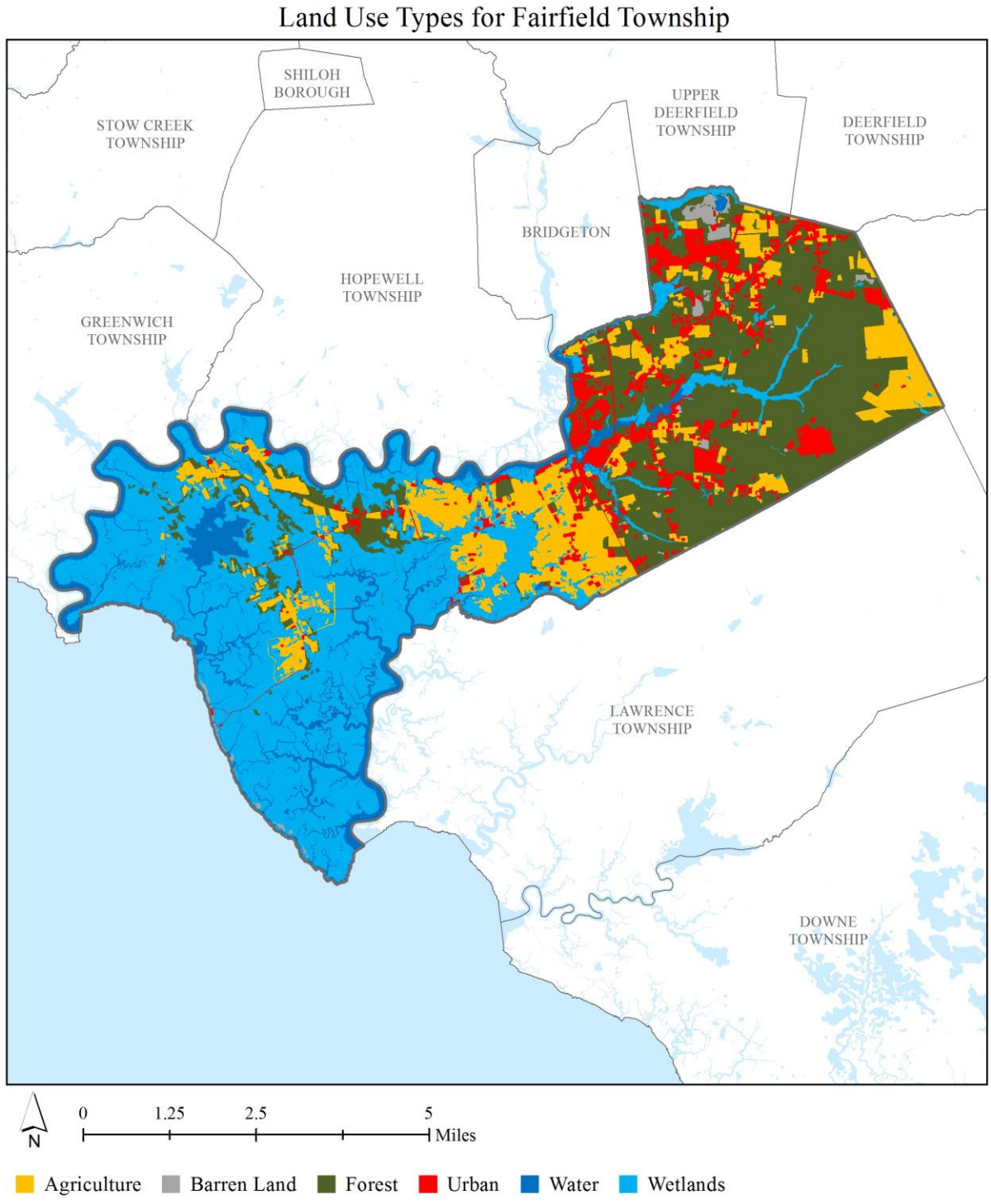


Figure 1: Map illustrating the land use in Fairfield Township

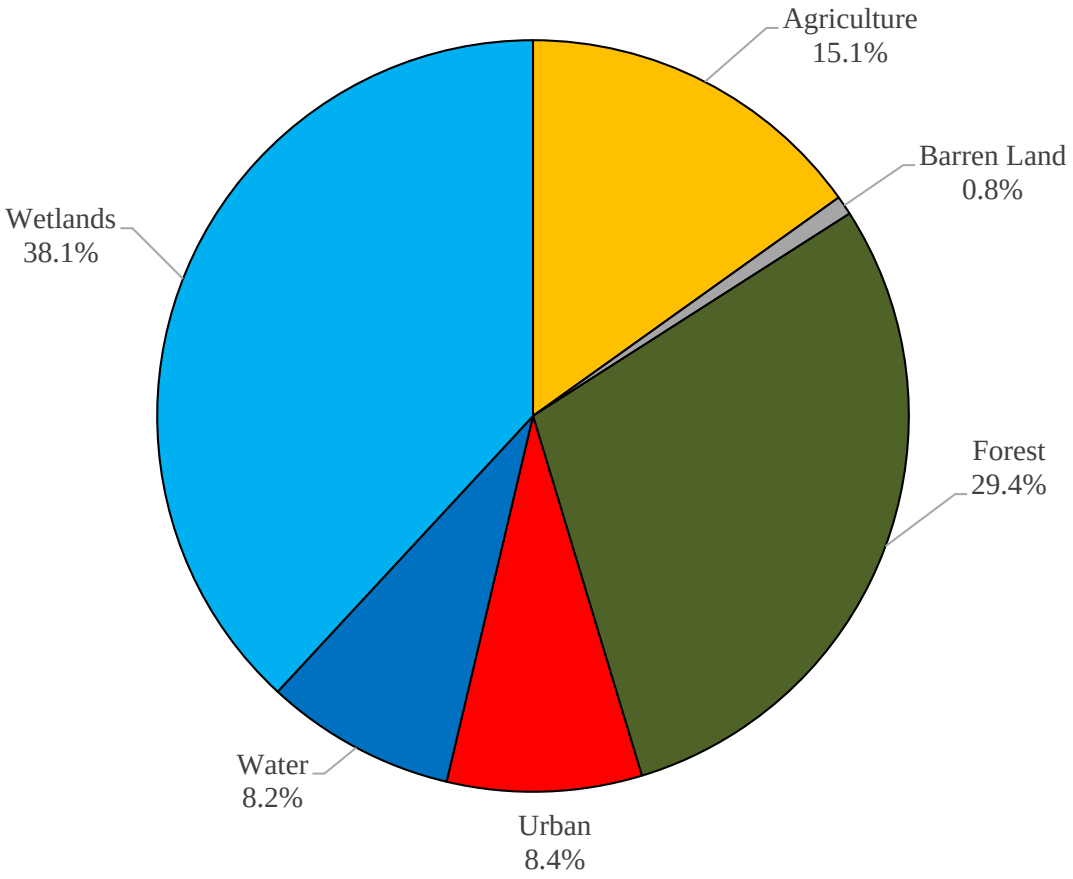


Figure 2: Pie chart illustrating the land use in Fairfield Township

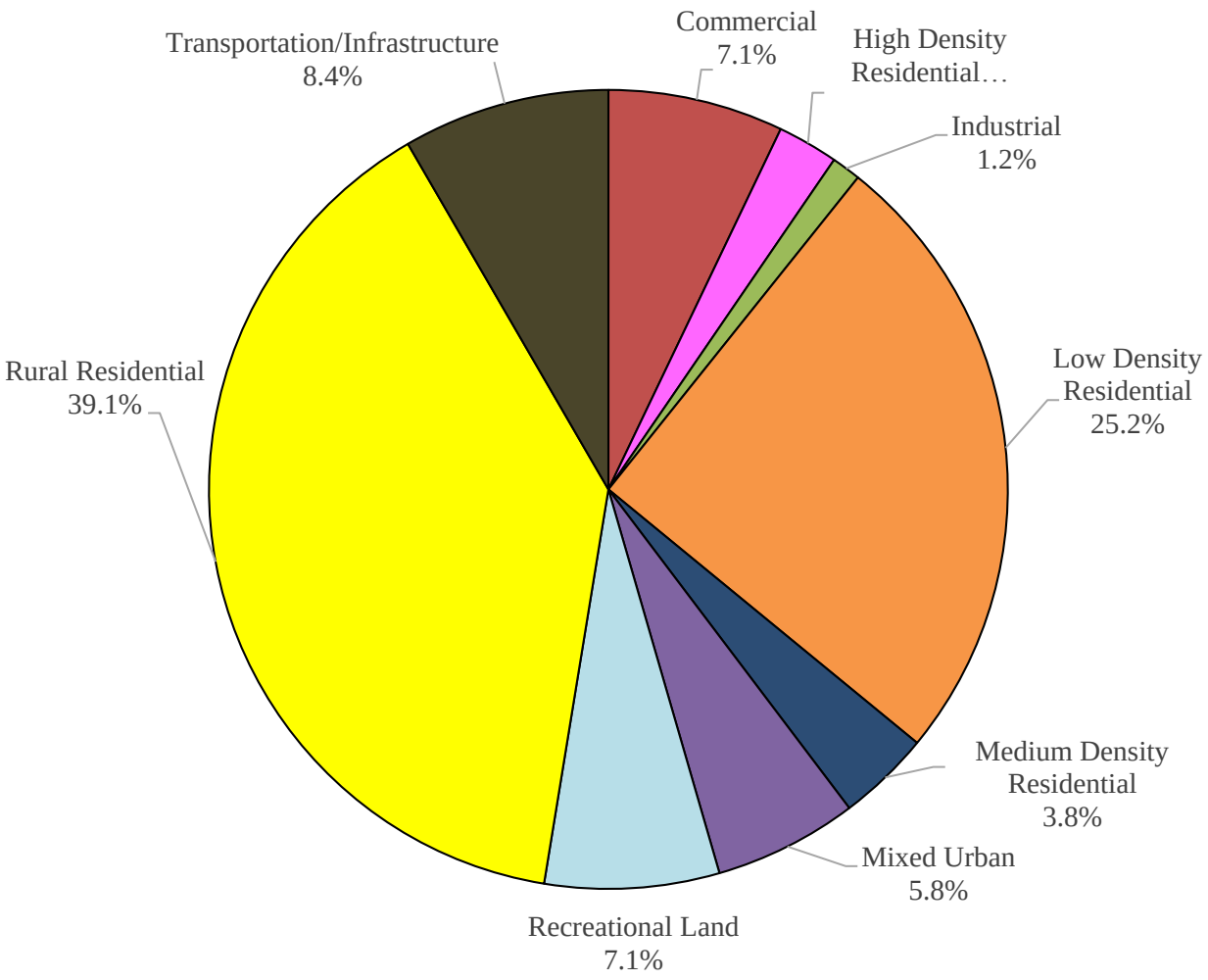


Figure 3: Pie chart illustrating the various types of urban land use in Fairfield Township

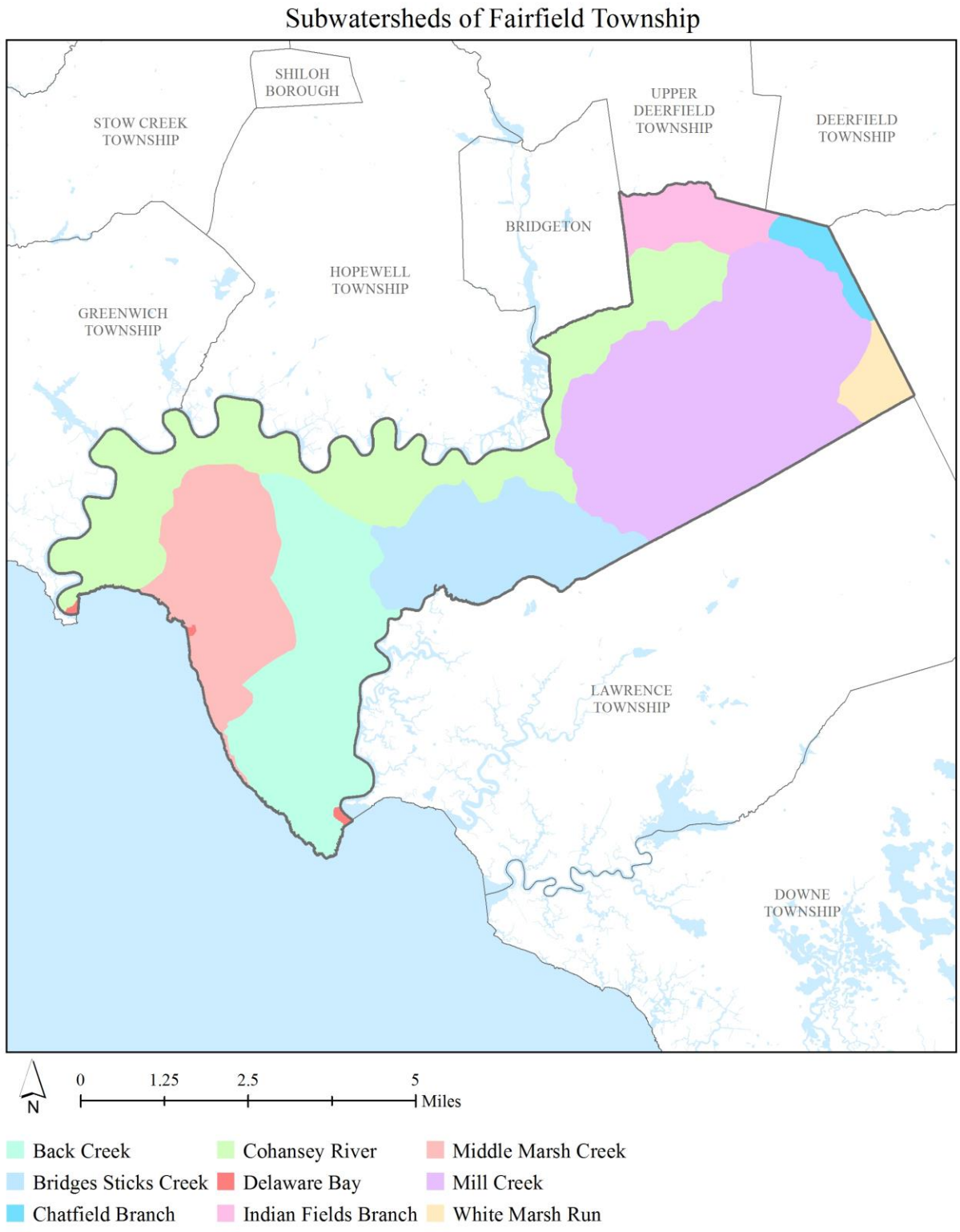


Figure 4: Map of the subwatersheds in Fairfield Township

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 2012 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 Fairfield 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 Fairfield 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 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 practices 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*.

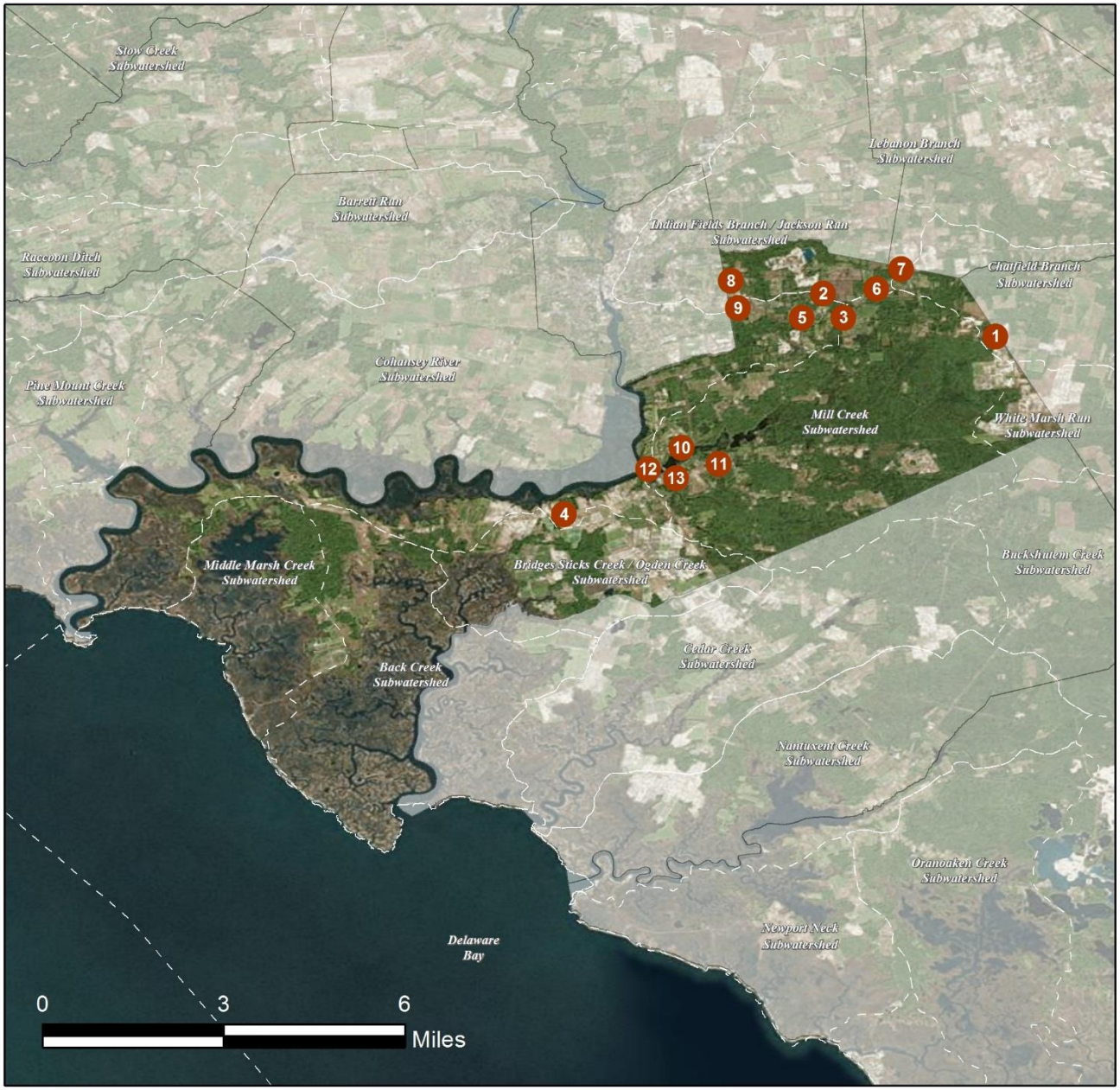
Conclusion

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. Green Infrastructure Sites

FAIRFIELD TOWNSHIP: GREEN INFRASTRUCTURE SITES



SITES WITHIN THE CHATERFIELD BRANCH SUBWATERSHED:

1. Maranatha Baptist Church

SITES WITHIN THE COHANSEY RIVER SUBWATERSHED:

2. Fairfield Township School
3. Gouldtown Fire Company Station 15
4. South Cumberland Medical Associates
5. Trinity AME Church

SITES WITHIN THE INDIAN FIELDS BRANCH SUBWATERSHED:

6. St. John's United Methodist Church
7. Trinity Holiness Church

SITES WITHIN THE JACKSON RUN SUBWATERSHED:

8. Crusaders for Christ Evangelistic Center
9. Glory Tabernacle Child Care

SITES WITHIN THE MILL CREEK SUBWATERSHED:

10. Church of God in Christ
11. Fairton Christian Academy
12. Fairfield Presbyterian Church
13. Salem County Special Services School District

b. Proposed Green Infrastructure Concepts

MARANATHA BAPTIST CHURCH

Subwatershed: Chaterfield Branch

Site Area: 561,506 sq. ft.

Address: 1524 Bridgeton Millville Pike
Millville, NJ 08332

Block and Lot: Block 5, Lots 49,50

Stormwater is currently directed to existing catch basins throughout the parking lot. Parking spots on the far east and west sides of the parking lot can be replaced with porous asphalt 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	123,898	6.0	62.6	568.9	0.097	3.40

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
Pervious pavement	0.942	158	69,003	1.46	6,455	$161,375

GREEN INFRASTRUCTURE RECOMMENDATIONS

Maranatha Baptist Church

- pervious pavement
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 50' 100'

FAIRFIELD TOWNSHIP SCHOOL

Subwatershed: **Cohansey River**

Site Area: **1,044,128 sq. ft.**

Address: **375 Gouldtown Woodruff Road**
Bridgeton, NJ 08302

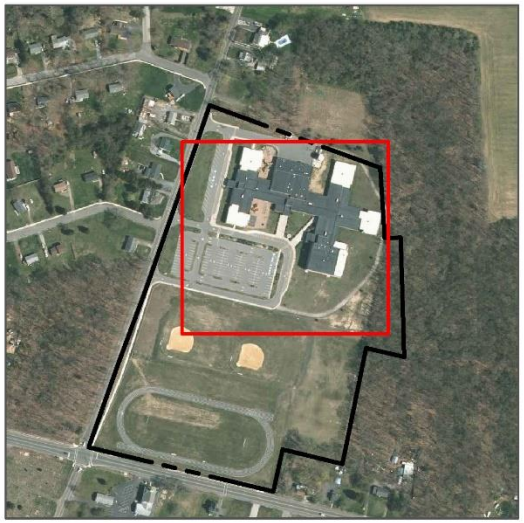
Block and Lot: **Block 18, Lot 25,26**

Stormwater currently drains from disconnected downspouts. A rain garden in between the two main entrances of the school can capture, treat, and infiltrate roof runoff as well as add to the existing landscaping of the school. 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"
41	427,427	20.6	215.9	1,962.5	0.333	11.72

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	0.247	41	18,087	0.49	2,365	$11,825

GREEN INFRASTRUCTURE RECOMMENDATIONS



Fairfield Township School

- bioretention system
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 50' 100'

GOULDTOWN FIRE COMPANY STATION 15

Subwatershed: Cohansey River

Site Area: 65,108 sq. ft.

Address: 1137 Bridgeton Millville Pike
Bridgeton, NJ, 08302

Block and Lot: Block 23, Lot 9

Stormwater currently drains from the property and the roofs of the buildings without downspouts. A cistern, as well as a downspout, can be installed on the northwest corner of the west building to capture stormwater runoff. The water can then be used for washing vehicles or for other non-potable uses such as car wash fundraisers or watering existing landscape plants. 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"
39	25,576	1.2	12.9	117.4	0.020	0.70

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
Rainwater harvesting	0.040	7	2,902	0.08	1,185 (gal)	$2,370

GREEN INFRASTRUCTURE RECOMMENDATIONS

Gouldtown Fire Company

- rainwater harvesting
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 25' 50'

SOUTH CUMBERLAND MEDICAL ASSOCIATES

Subwatershed: Cohansey River

Site Area: 89,833 sq. ft.

Address: 215 Back Neck Road
Bridgeton, NJ 08302

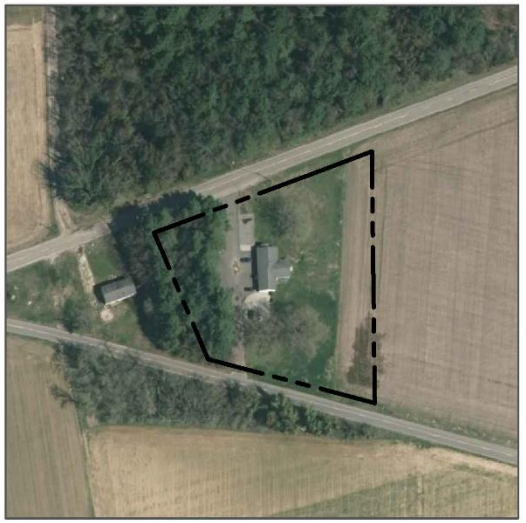
Block and Lot: Block 49, Lot 6

Stormwater currently drains from the property to the roadway. Parking spots in front of the building can be replaced with porous asphalt to capture and infiltrate stormwater and roof runoff. Rain gardens adjacent to the rear side of the building can capture, treat, and infiltrate additional 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"
16	14,521	0.7	7.3	66.7	0.011	0.40

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	0.040	7	2,925	0.07	385	$1,925
Pervious pavement	0.076	13	5,543	0.15	1,035	$25,875

GREEN INFRASTRUCTURE RECOMMENDATIONS



South Cumberland Medical Associates

- bioretention system
- pervious pavement
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 25' 50'

TRINITY AME CHURCH

Subwatershed: **Cohansey River**

Site Area: **310,198 sq. ft.**

Address: **1107 Bridgeton Millville Pike**
Bridgeton, NJ 08302

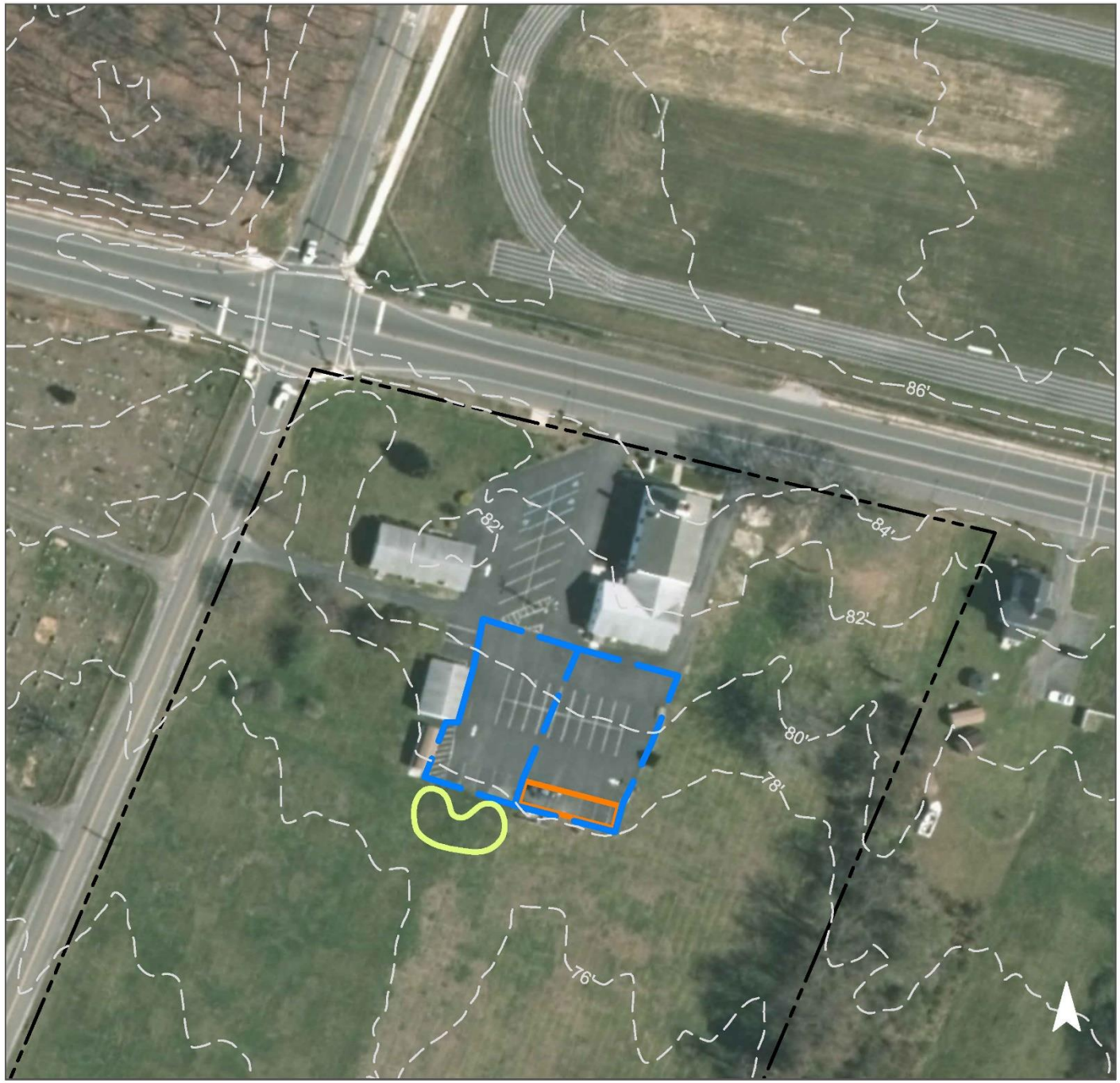
Block and Lot: **Block 23, Lot 1,2**

Stormwater is currently directed to an existing detention basin. Parking spots in the southeast corner of the parking lot can be replaced with porous asphalt to capture and infiltrate stormwater. A rain garden on the southwest side of the parking lot can capture, treat, 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"
17	51,551	2.5	26.0	236.7	0.040	1.41

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	0.172	29	12,581	0.34	1,645	$8,225
Pervious pavement	0.190	32	13,913	0.38	1,300	$32,500

GREEN INFRASTRUCTURE RECOMMENDATIONS



Trinity AME Church

- bioretention system
- pervious pavement
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 50' 100'

ST. JOHN'S UNITED METHODIST CHURCH

Subwatershed: Indian Fields Branch

Site Area: 1,006,950 sq. ft.

Address: 680 Fordville Road
Bridgeton, NJ 08302

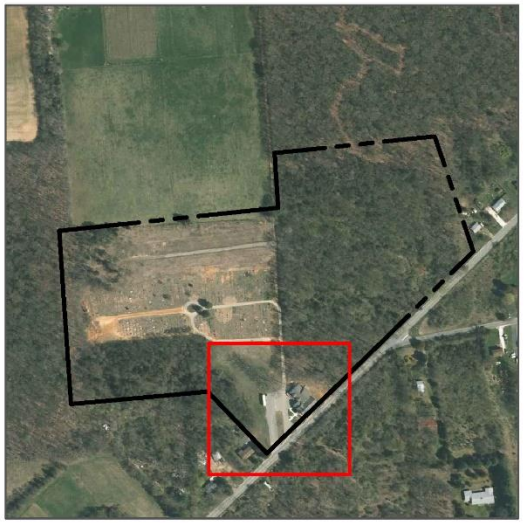
Block and Lot: Block 3,18, Lot 6,7; 4,4.01,5

Stormwater currently drains from the property to the roadway. A bioswale placed on the east side of the island in the middle of the parking lot can capture, treat, and infiltrate roof runoff and stormwater runoff from a good portion of the parking lot. 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"
4	40,927	2.0	20.7	187.9	0.032	1.12

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
Bioswale	0.282	47	20,660	0.56	2,705	$13,575

GREEN INFRASTRUCTURE RECOMMENDATIONS



St. John's United Methodist Church

- bioswale
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 50' 100'

Trinity Holiness Church

Subwatershed: Indian Fields Branch

Site Area: 64,392 sq. ft.

Address: 762 Fordville Road
Bridgeton, NJ 08302

Block and Lot: Block 3, Lot 1.03,2.05

Stormwater currently drains to the roadway. Installing a rain garden adjacent to the building can capture, treat, and infiltrate 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"
21	13,448	0.6	6.8	61.7	0.010	0.37

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	0.034	6	2.483	0.07	325	$1,625

GREEN INFRASTRUCTURE RECOMMENDATIONS

Trinity Holiness Church

- bioretention system
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 25' 50'

CRUSADERS FOR CHRIST EVANGELISTIC CENTER

Subwatershed: Jackson Run

Site Area: 644,545 sq. ft.

Address: 33 Reeves Road
Bridgeton, NJ 08302

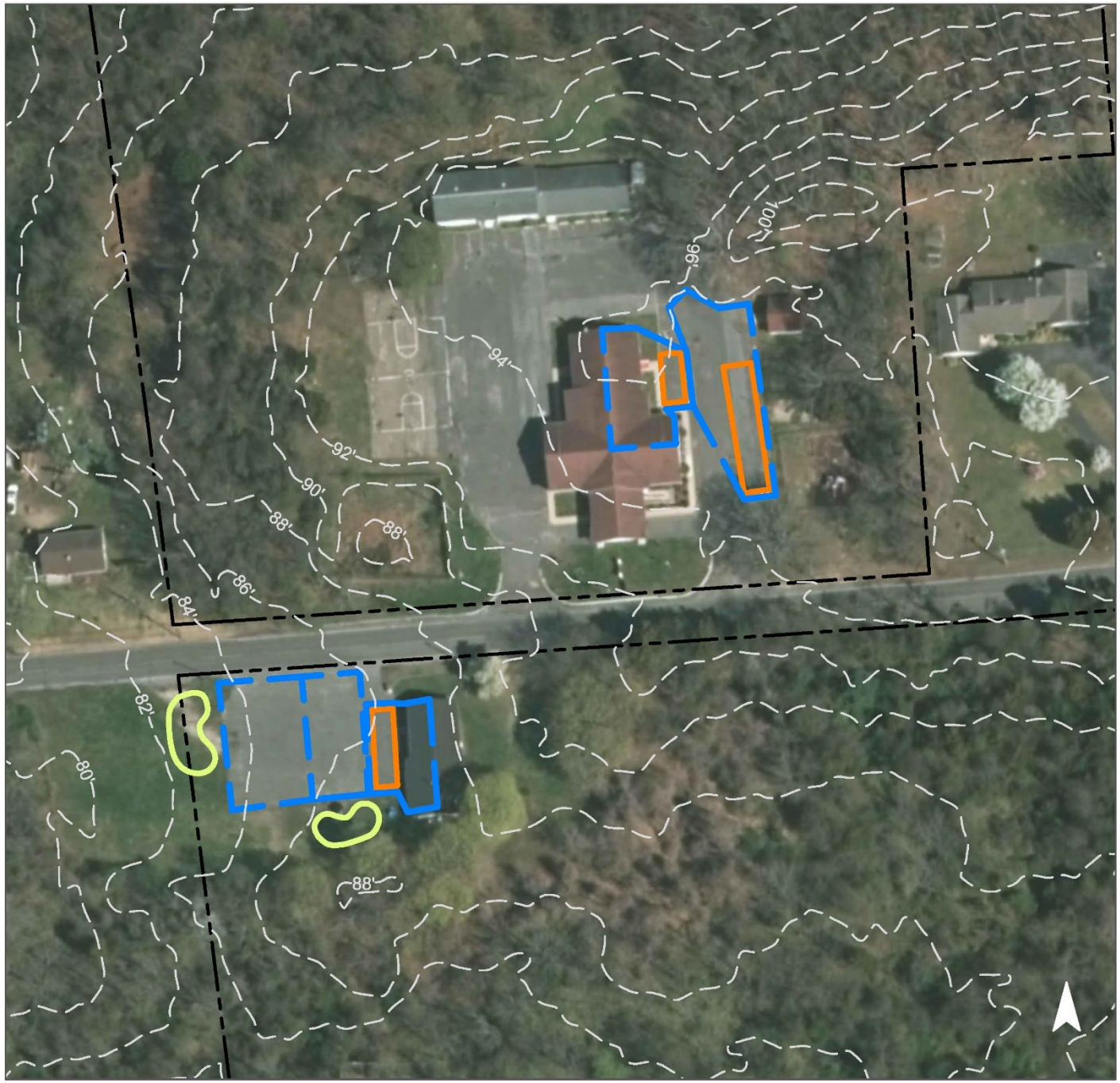
Block and Lot: Block 1,19, Lot 7,1

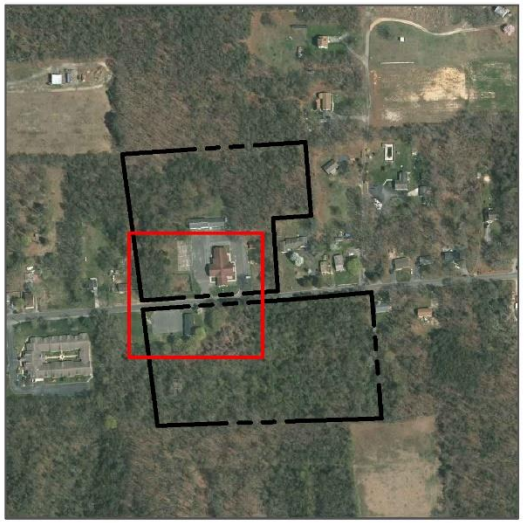
Stormwater currently drains from the property to the surrounding area. Parking spots adjacent to the south building and in the north parking lot can be replaced with porous asphalt to capture and infiltrate roof runoff. Installing rain gardens adjacent to the south building parking lot, on the south and west sides, can capture, treat, 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"
12	75,799	3.7	38.7	348.0	0.059	2.80

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	0.211	35	15,484	0.37	2,025	$10,125
Pervious pavement	0.306	51	22,388	0.47	3,530	$88,250

GREEN INFRASTRUCTURE RECOMMENDATIONS





Crusaders for Christ Evangelistic Center

- bioretention system
- pervious pavement
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 50' 100'

GLORY TABERNACLE CHILD CARE

Subwatershed: Jackson Run

Site Area: 569,425 sq. ft.

Address: 827 East Commerce Street
Bridgeton, NJ 08302

Block and Lot: Block 19, Lot 47.02

Stormwater is currently directed to existing catch basins. The main parking lot is in poor shape, and parking spots can be replaced with porous asphalt 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"
17	95,470	4.6	48.2	438.3	0.074	2.62

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
Pervious pavement	0.338	57	24,759	0.67	4,630	$115,750

GREEN INFRASTRUCTURE RECOMMENDATIONS

Glory Tabernacle Child Care

- pervious pavement
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 50' 100'

CHURCH OF GOD IN CHRIST

Subwatershed: Mill Creek

Site Area: 30,550 sq. ft.

Address: 93 Fairton Millville Road
Bridgeton, NJ 08302

Block and Lot: Block 27.03, Lot 24

Stormwater currently drains from the property. Parking spots in the rear of the property can be replaced with porous asphalt to capture and infiltrate the majority of 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"
44	13,480	0.6	6.8	61.9	0.011	0.37

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
Pervious pavement	0.232	39	17,039	0.46	1,590	$39,750

GREEN INFRASTRUCTURE RECOMMENDATIONS

Church of God in Christ

- pervious pavement
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 25' 50'

FAIRTON CHRISTIAN ACADEMY

Subwatershed: Mill Creek

Site Area: 330,225 sq. ft.

Address: 199 Fairton Millville Road
Bridgeton, NJ 08302

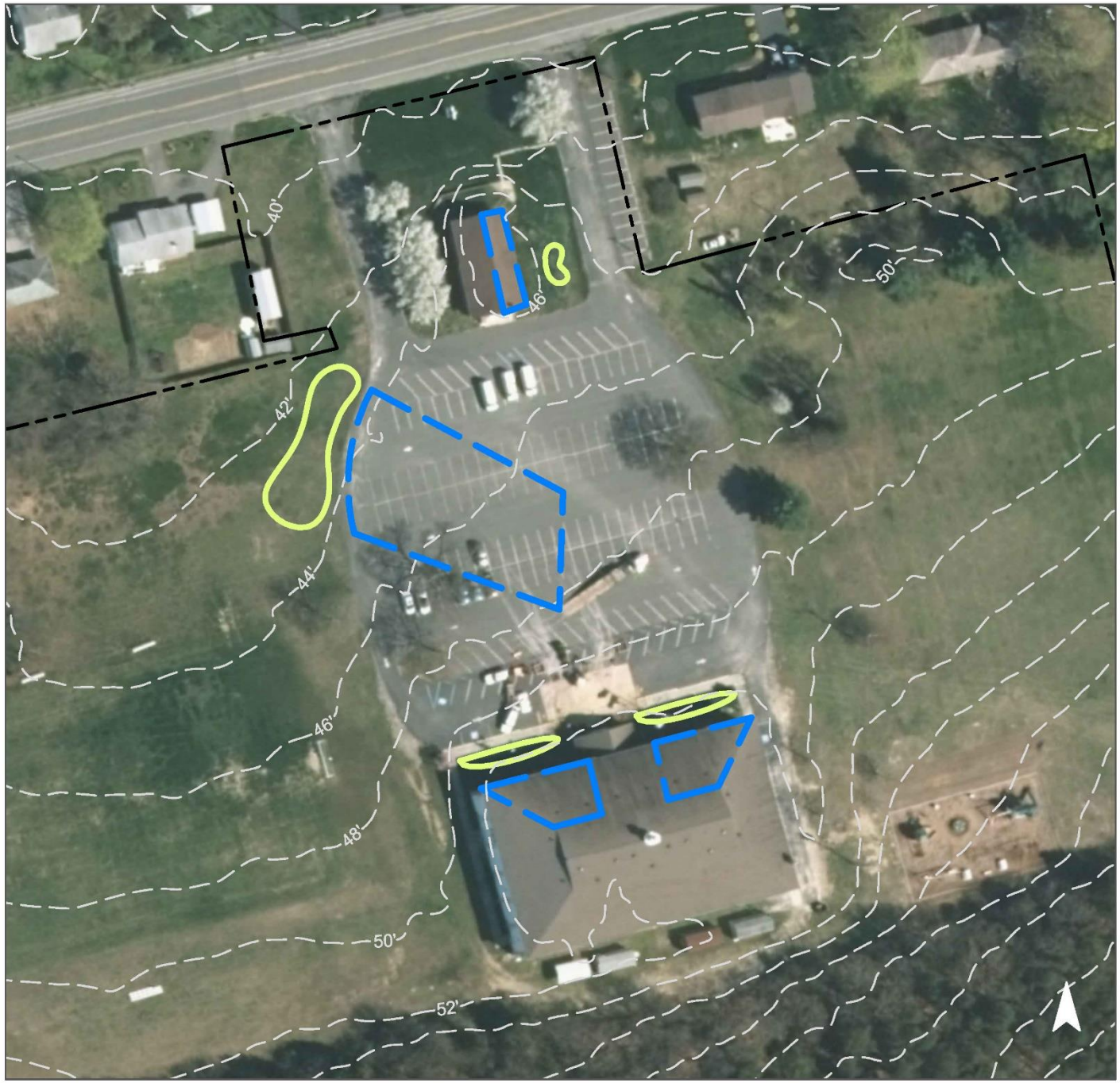
Block and Lot: Block 33, Lot 35,35.07

Stormwater is currently directed to the ground through disconnected downspouts and the sewer system through connected downspouts. Rain gardens adjacent to the buildings can capture, treat, and infiltrate 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"
28	90,953	4.4	45.9	417.6	0.071	2.49

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	0.436	73	31,947	0.87	4,179	$20,895

GREEN INFRASTRUCTURE RECOMMENDATIONS



Fairton Christian Academy

- bioretention system
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 50' 100'

FAIRFIELD PRESBYTERIAN CHURCH

Subwatershed: Mill Creek

Site Area: 50,112 sq. ft.

Address: 53 Main Street
Fairfield Township, NJ 08302

Block and Lot: Block 27.03,
Lot 11,12,13

Stormwater currently drains from the property. Parking spots by the southwest building can be replaced with porous asphalt to capture and infiltrate stormwater. Rain gardens adjacent to the east building and in the parking lot of the southwest building can capture, treat, and infiltrate 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"
52	25,826	1.2	13.0	118.6	0.020	0.71

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	0.137	23	10,068	0.27	1,320	$6,600
Pervious pavement	0.119	20	8,722	0.24	1,630	$40,750

GREEN INFRASTRUCTURE RECOMMENDATIONS

Fairfield Presbyterian Church

- bioretention system
- pervious pavement
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 50' 100'

SALEM COUNTY SPECIAL SERVICES SCHOOL DISTRICT

Subwatershed: Mill Creek

Site Area: 106,252 sq. ft.

Address: 13 Ramah Road
Bridgeton, NJ 08302

Block and Lot: Block 33, Lot 28

Stormwater is currently directed to existing catch basins and the roadway. Parking spots on the west side of the building can be replaced with porous asphalt to capture and infiltrate stormwater. Rain gardens adjacent to the building and the west parking lot can capture, treat, and infiltrate stormwater and 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"
69	73,352	3.5	37.0	336.8	0.057	2.01

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	0.163	27	11,923	0.32	1,560	$7,800
Pervious pavement	0.054	9	3,934	0.11	735	$18,375

GREEN INFRASTRUCTURE RECOMMENDATIONS

Salem County Special Services School District

- bioretention system
- pervious pavement
- drainage area
- property line
- 2015 Aerial: NJOIT, OGIS

0 50' 100'

c. Summary of Existing Conditions

Summary of Proposed Green Infrastructure Practices

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)
CHATERFIELD BRANCH SUBWATERSHED	**12.89**	**561,506**			**6.0**	**62.6**	**568.9**		**2.84**	**123,898**	**0.097**	**3.40**
Maranatha Baptist Church												
Total Site Info	12.89	561,506	5	49,50,51	6.0	62.6	568.9	22	2.84	123,898	0.097	3.40
COHANSEY RIVER SUBWATERSHED	**34.65**	**1,509,267**			**25.0**	**262.2**	**2383.3**		**11.92**	**519,075**	**0.404**	**14.24**
Fairfield Township School												
Total Site Info	23.97	1,044,128	18	25,26	20.6	215.9	1962.5	41	9.81	427,427	0.333	11.72
Gouldtown Fire Company Station 15												
Total Site Info	1.49	65,108	23	9	1.2	12.9	117.4	39	0.59	25,576	0.020	0.70
South Cumberland Medical Associates												
Total Site Info	2.06	89,833	49	6	0.7	7.3	66.7	16	0.33	14,521	0.011	0.40
Trinity AME Church												
Total Site Info	7.12	310,198	23	1,2	2.5	26.0	236.7	17	1.18	51,551	0.040	1.41
INDIAN FIELDS BRANCH SUBWATERSHED	**24.59**	**1,071,342**			**2.6**	**27.5**	**249.7**		**1.25**	**54,375**	**0.042**	**1.49**
St. John's United Methodist Church												
Total Site Info	23.12	1,006,950	3,18	6, 7, 4, 4.01, 5	2.0	20.7	187.9	4	0.94	40,927	0.032	1.12
Trinity Holiness Church												
Total Site Info	1.48	64,392	3	1.03,2.05	0.6	6.8	61.7	21	0.31	13,448	0.010	0.37
JACKSON RUN SUBWATERSHED	**27.87**	**1,213,969**			**8.3**	**86.5**	**786.4**		**3.93**	**171,269**	**0.133**	**4.70**
Crusaders for Christ Evangelistic Center												
Total Site Info	14.80	644,545	1,19	7,1	3.7	38.3	348.0	12	1.74	75,799	0.059	2.08
Glory Tabernacle Child Care												
Total Site Info	13.07	569,425	19	47.02, 47.03	4.6	48.2	438.3	17	2.19	95,470	0.074	2.62

Summary of Proposed Green Infrastructure Practices

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)
MILL CREEK SUBWATERSHED	**11.87**	**517,138**			**9.8**	**102.8**	**934.9**		**4.67**	**203,611**	**0.159**	**5.58**
Church of God in Christ												
Total Site Info	0.70	30,550	33	12	0.6	6.8	61.9	44	0.31	13,480	0.011	0.37
Fairton Christian Academy												
Total Site Info	7.58	330,225	33	35.07	4.4	45.9	417.6	28	2.09	90,953	0.071	2.49
Fairfield Presbyterian Church												
Total Site Info	1.15	50,112	27.03	11,12,13	1.2	13.0	118.6	52	0.59	25,826	0.020	0.71
Salem County Special Services School District												
Total Site Info	2.44	106,252	33	28	3.5	37.0	336.8	69	1.68	73,352	0.057	2.01

d. 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 %
	CHATERFIELD BRANCH SUBWATERSHED	**36,150**	**0.83**	**0.942**	**158**	**69,003**	**1.46**	**6,455**			**$161,375**	**6.4%**
1	**Maranatha Baptist Church**											
	Pervious pavement	36,150	0.83	0.942	158	69,003	1.46	6,455	25	SF	$161,375	29.2%
	Total Site Info	**36,150**	**0.83**	**0.942**	**158**	**69,003**	**1.46**	**6,455**			**$161,375**	**29.2%**
	COHANSEY RIVER SUBWATERSHED	**29,280**	**0.67**	**0.763**	**128**	**55,950**	**1.51**	**7,915**			**$82,720**	**1.9%**
2	**Fairfield Township School**											
	Bioretention systems	9,465	0.22	0.247	41	18,087	0.49	2,365	5	SF	$11,825	2.2%
	Total Site Info	**9,465**	**0.22**	**0.247**	**41**	**18,087**	**0.49**	**2,365**			**$11,825**	**2.2%**
3	**Gouldtown Fire Company Station 15**											
	Rainwater harvesting	1,520	0.03	0.040	7	2,902	0.08	1,185	2	gal	$2,370	5.9%
	Total Site Info	**1,520**	**0.03**	**0.040**	**7**	**2,902**	**0.08**	**1,185**			**$2,370**	**5.9%**
4	**South Cumberland Medical Associates**											
	Bioretention systems	1,530	0.04	0.040	7	2,925	0.07	385	5	SF	$1,925	10.5%
	Pervious pavement	2,900	0.07	0.076	13	5,543	0.15	1,035	25	SF	$25,875	20.0%
	Total Site Info	**4,430**	**0.10**	**0.115**	**19**	**8,467**	**0.22**	**1,420**			**$27,800**	**30.5%**
5	**Trinity AME Church**											
	Bioretention system	6,585	0.15	0.172	29	12,581	0.34	1,645	5	SF	$8,225	12.8%
	Pervious pavement	7,280	0.17	0.190	32	13,913	0.38	1,300	25	SF	$32,500	14.1%
	Total Site Info	**13,865**	**0.32**	**0.361**	**60**	**26,494**	**0.72**	**2,945**			**$40,725**	**26.9%**
	INDIAN FIELDS BRANCH SUBWATERSHED	**12,110**	**0.28**	**0.316**	**53**	**23,143**	**0.63**	**3,030**			**$15,150**	**1.1%**
6	**St. John's United Methodist Church**											
	Bioswale	10,810	0.25	0.282	47	20,660	0.56	2,705	5	SF	$13,525	26.4%
	Total Site Info	**10,810**	**0.25**	**0.282**	**47**	**20,660**	**0.56**	**2,705**			**$13,525**	**26.4%**
7	**Trinity Holiness Church**											
	Bioretention system	1,300	0.03	0.034	6	2,483	0.07	325	5	SF	$1,625	9.7%
	Total Site Info	**1,300**	**0.03**	**0.034**	**6**	**2,483**	**0.07**	**325**			**$1,625**	**9.7%**

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 %
	JACKSON RUN SUBWATERSHED	**32,790**	**0.75**	**0.854**	**143**	**62,630**	**1.51**	**10,185**			**$214,125**	**2.7%**
8	**Crusaders for Christ Evangelistic Center**											
	Bioretention systems	8,105	0.19	0.211	35	15,484	0.37	2,025	5	SF	$10,125	10.7%
	Pervious pavement	11,730	0.27	0.306	51	22,388	0.47	3,530	25	SF	$88,250	15.5%
	Total Site Info	**19,835**	**0.46**	**0.517**	**87**	**37,871**	**0.84**	**5,555**			**$98,375**	**26.2%**
9	**Glory Tabernacle Child Care**											
	Pervious pavement	12,955	0.30	0.338	57	24,759	0.67	4,630	25	SF	$115,750	13.6%
	Total Site Info	**12,955**	**0.30**	**0.338**	**57**	**24,759**	**0.67**	**4,630**			**$115,750**	**13.6%**
	MILL CREEK SUBWATERSHED	**43,764**	**1.00**	**1.140**	**191**	**83,634**	**2.27**	**11,014**			**$134,170**	**8.5%**
10	**Church of God in Christ**											
	Pervious pavement	8,915	0.20	0.232	39	17,039	0.46	1,590	25	SF	$39,750	66.1%
	Total Site Info	**8,915**	**0.20**	**0.232**	**39**	**17,039**	**0.46**	**1,590**			**$39,750**	**66.1%**
11	**Fairton Christian Academy**											
	Bioretention systems	16,715	0.38	0.436	73	31,947	0.87	4,179	5	SF	$20,895	18.4%
	Total Site Info	**16,715**	**0.38**	**0.436**	**73**	**31,947**	**0.87**	**4,179**			**$20,895**	**18.4%**
12	**Fairfield Presbyterian Church**											
	Bioretention systems	5,270	0.12	0.137	23	10,068	0.27	1,320	5	SF	$6,600	20.4%
	Pervious pavement	4,564	0.10	0.119	20	8,722	0.24	1,630	25	SF	$40,750	17.7%
	Total Site Info	**9,834**	**0.23**	**0.256**	**43**	**18,790**	**0.51**	**2,950**			**$47,350**	**38.1%**
13	**Salem County Special Services School District**											
	Bioretention systems	6,240	0.14	0.163	27	11,923	0.32	1,560	5	SF	$7,800	8.5%
	Pervious pavement	2,060	0.05	0.054	9	3,934	0.11	735	25	SF	$18,375	2.8%
	Total Site Info	**8,300**	**0.19**	**0.216**	**36**	**15,858**	**0.43**	**2,295**			**$26,175**	**11.3%**