RUTGERS
New Jersey Agricultural
Experiment Station

Draft

Impervious Cover Reduction Action Plan
for
Shiloh Borough, Cumberland County, New Jersey

Prepared for Shiloh Borough by the
Rutgers Cooperative Extension Water Resources Program

June 11, 2018

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Introduction

Located in Cumberland County in southern New Jersey, Shiloh Borough covers approximately 1.2 square miles. Figures 1 and 2 illustrate that Shiloh Borough is dominated by agricultural land uses. A total of 20.4% of the municipality's land use is classified as urban. Of the urban land in Shiloh Borough, 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 Shiloh Borough 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 Shiloh Borough. Based upon the 2012 NJDEP land use/land cover data, approximately 5.9% of Shiloh Borough has impervious cover. This level of impervious cover suggests that the streams in Shiloh Borough are sensitive streams. [1]

Methodology

Shiloh Borough contains portions of three 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.

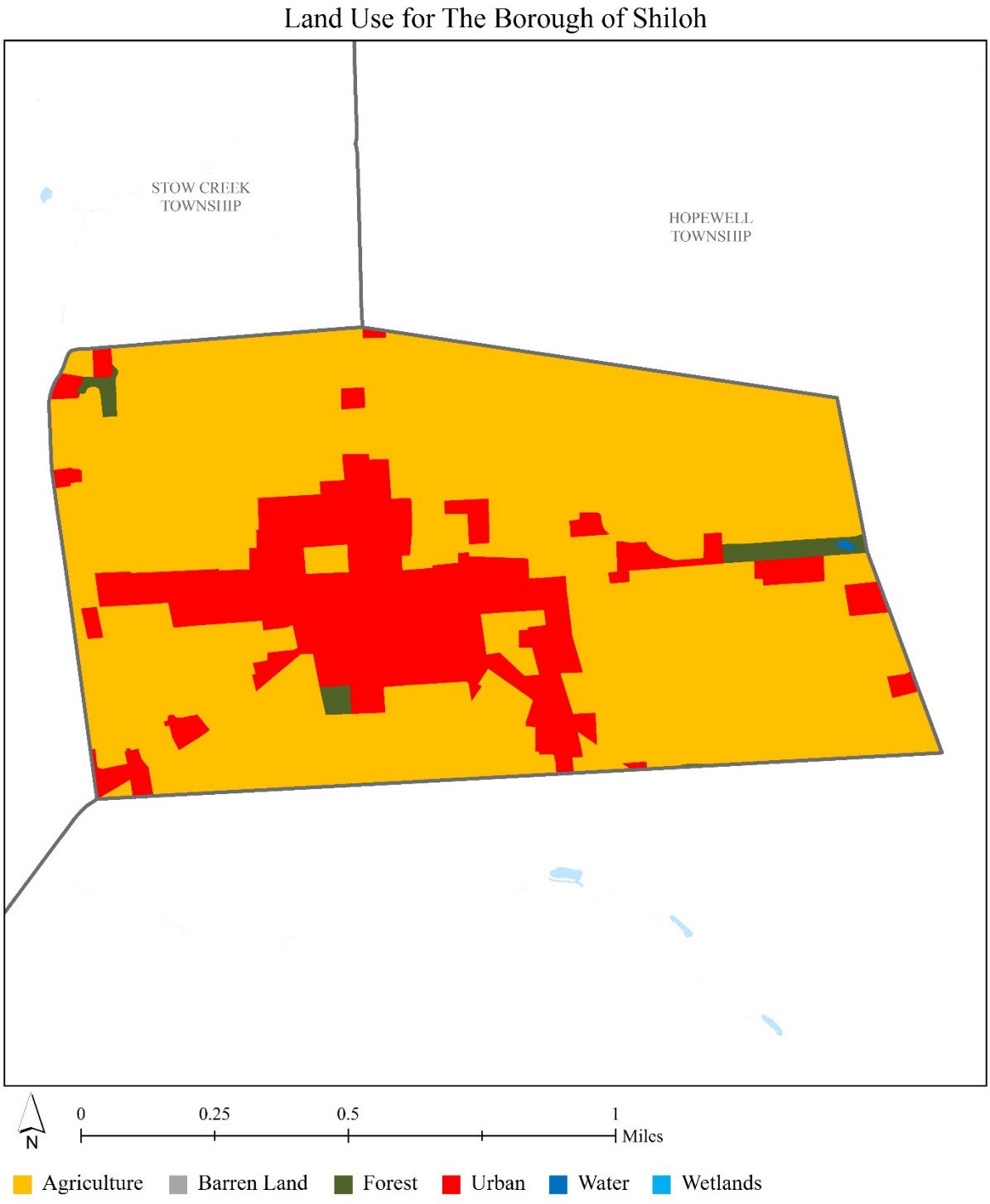


Figure 1: Map illustrating the land use in Shiloh Borough

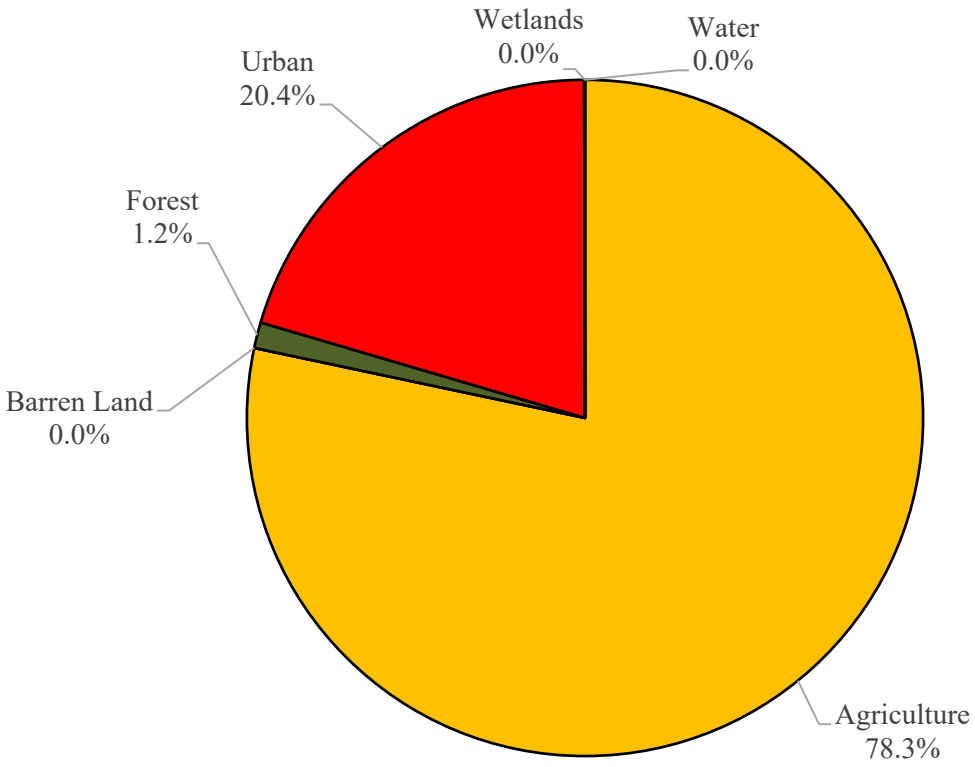


Figure 2: Pie chart illustrating the land use in Shiloh Borough

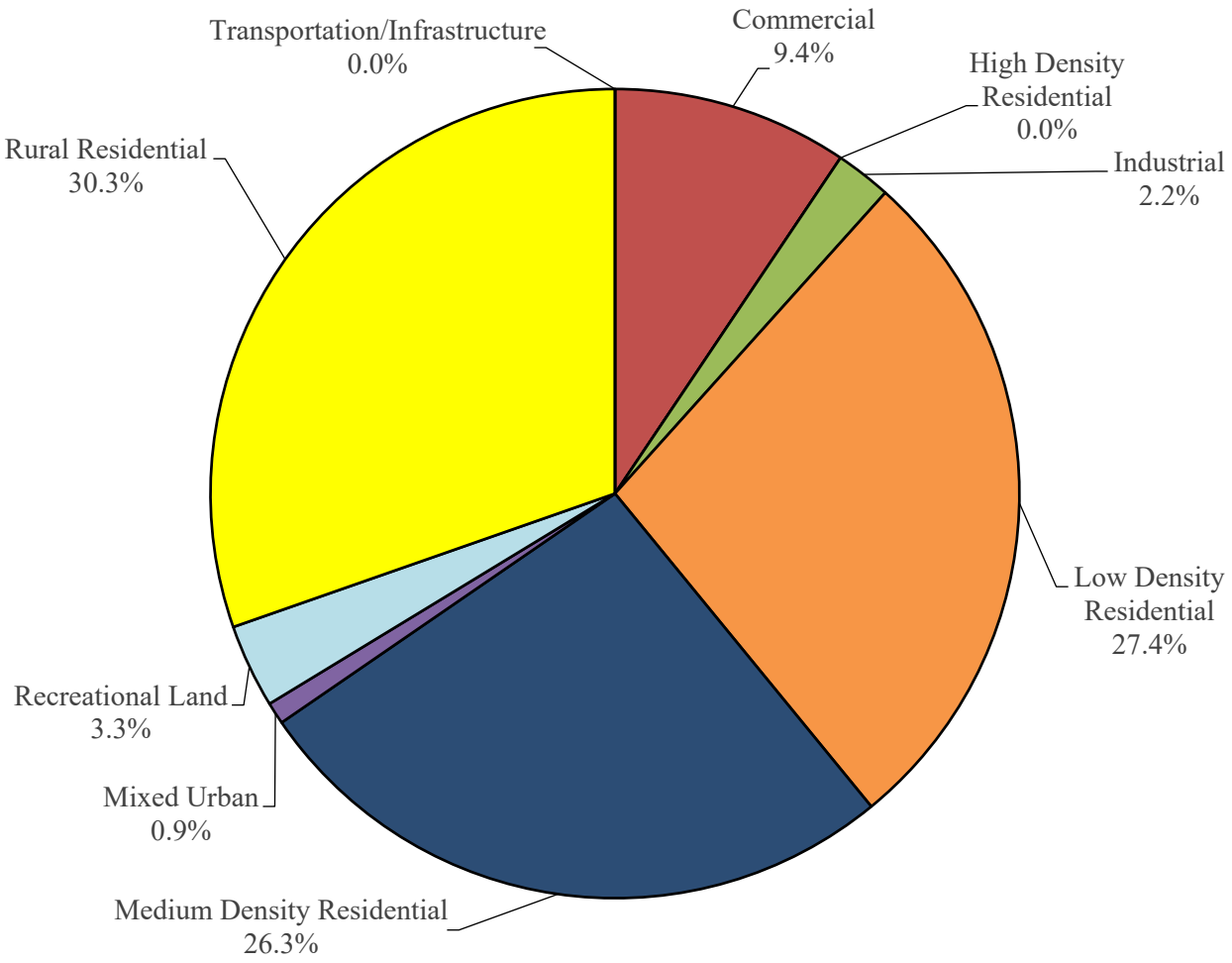


Figure 3: Pie chart illustrating the various types of urban land use in Shiloh Borough

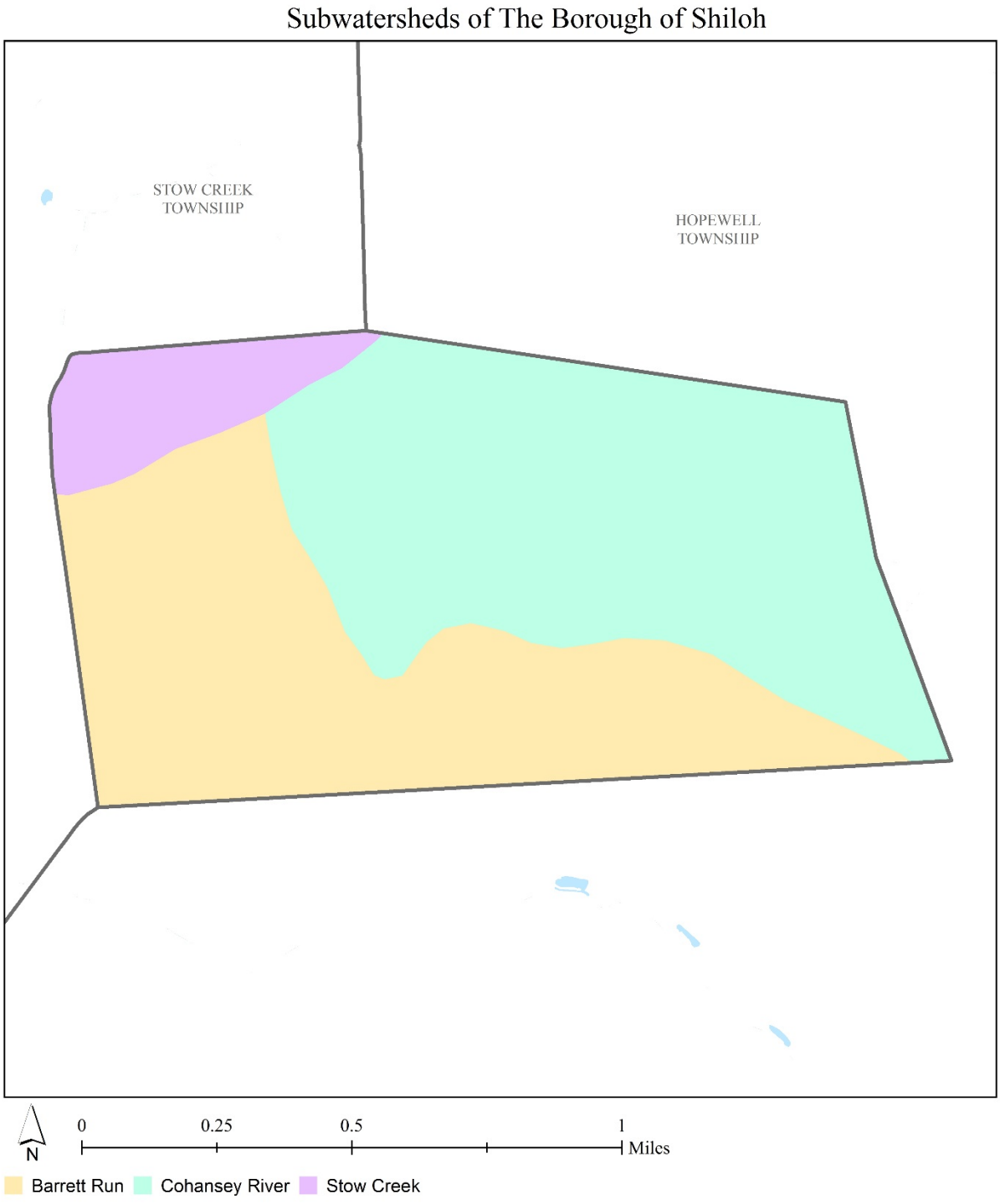


Figure 4: Map of the subwatersheds in Shiloh Borough

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 Shiloh Borough 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 Shiloh Borough. 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.

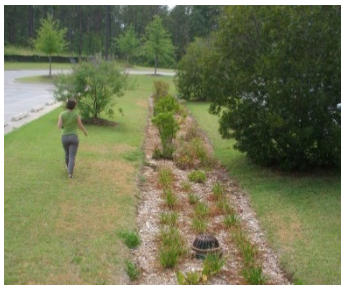
Downspout planter boxes

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

Appendix A contains information on potential project sites where green infrastructure practices could be installed as well as information on existing site conditions. The recommended green infrastructure practices and the drainage area that the green infrastructure practices can treat are identified for each potential project site. For each practice, the recharge potential, TSS removal potential, maximum volume reduction potential per storm, the peak reduction potential, and estimated costs 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

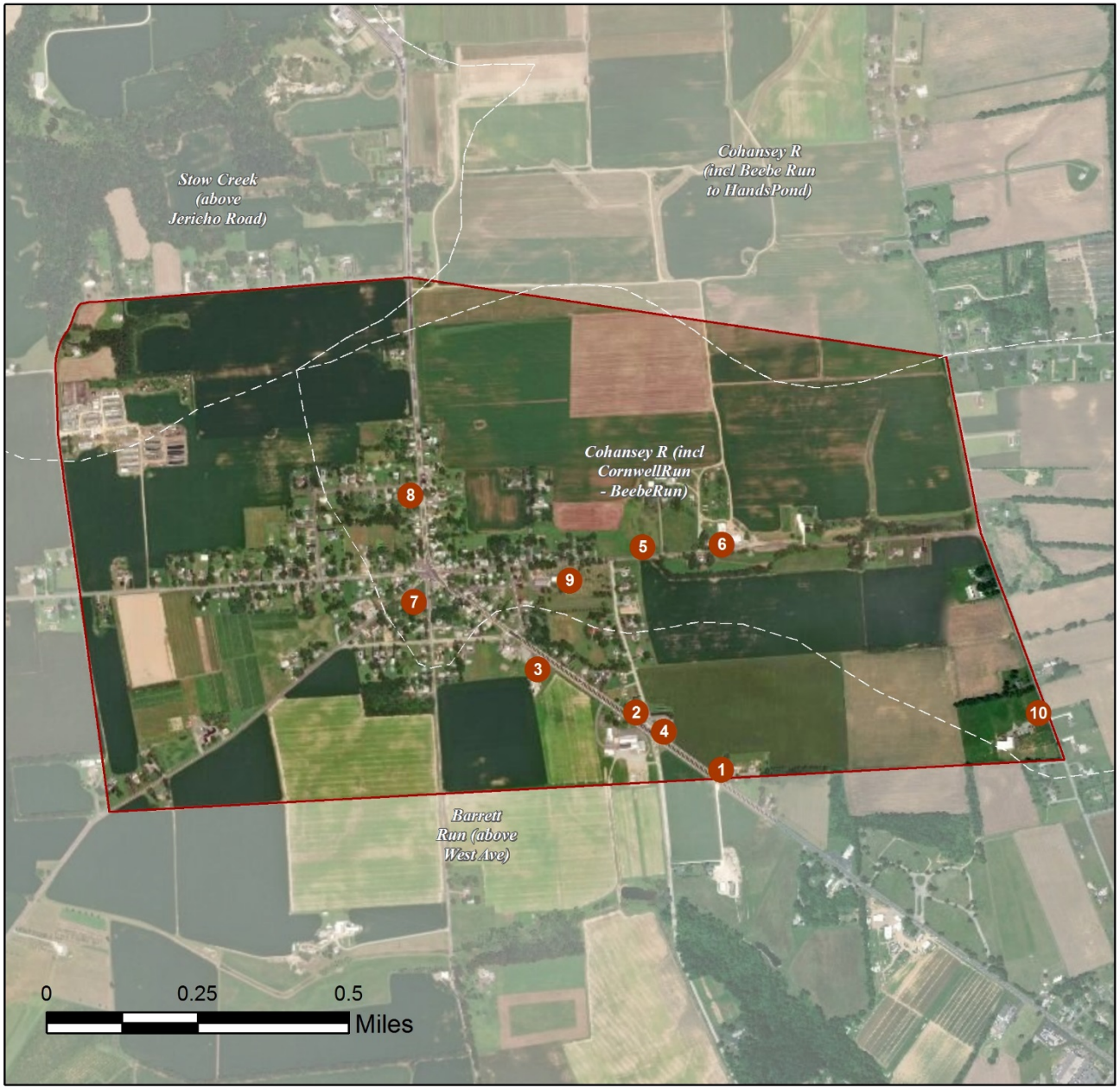
This impervious cover reduction action plan is meant to provide the municipality with a blueprint for implementing green infrastructure practices that will reduce the impact of stormwater runoff from impervious surfaces. These projects can be implemented by a wide variety of people such as boy scouts,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

Appendix A: Climate Resilient Green Infrastructure

a. Green Infrastructure Sites

SHILOH BOROUGH: GREEN INFRASTRUCTURE SITES



SITES WITHIN THE BARRETT RUN SUBWATERSHED

1. Roadside at 805 Main Street
2. Roadside at 866 Main Street
3. Shiloh Fire Department
4. Shiloh Medical Group

SITES WITHIN THE COHANSEY RIVER SUBWATERSHED

5. Roadside at 194 East Avenue
6. Roadside at 227 East Avenue
7. Shiloh Market
8. Shiloh Post Office
9. Shiloh Seventh Day Baptist Church
10. South Jersey Equestrian Center LLC

c. Summary of Existing Conditions

Roadside at 805 Main Street

Subwatershed: Barrett Run

Site Area: 2,182 sq. ft.

Address: 805 Main Street
Shiloh, NJ 08353

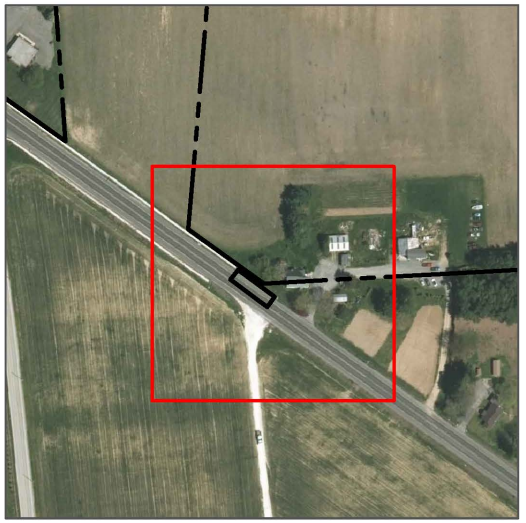
Block and Lot: Block n/a, Lot n/a

A bioswale can be installed in the area stretching from the end of the sidewalk to the first telephone pole. The area is trench-like, with a lower depth alongside the road that rises moving inward towards the field. 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"
95	2,073	0.1	1.0	9.5	0.002	0.06

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	0.019	4	1,350	0.01	360	$1,800

GREEN INFRASTRUCTURE RECOMMENDATIONS



Roadside at 805 Main Street

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

0 20' 40'

Roadside at 866 Main Street

Subwatershed: Barrett Run

Site Area: 1,485 sq. ft.

Address: 866 Main Street
Shiloh, NJ 08353

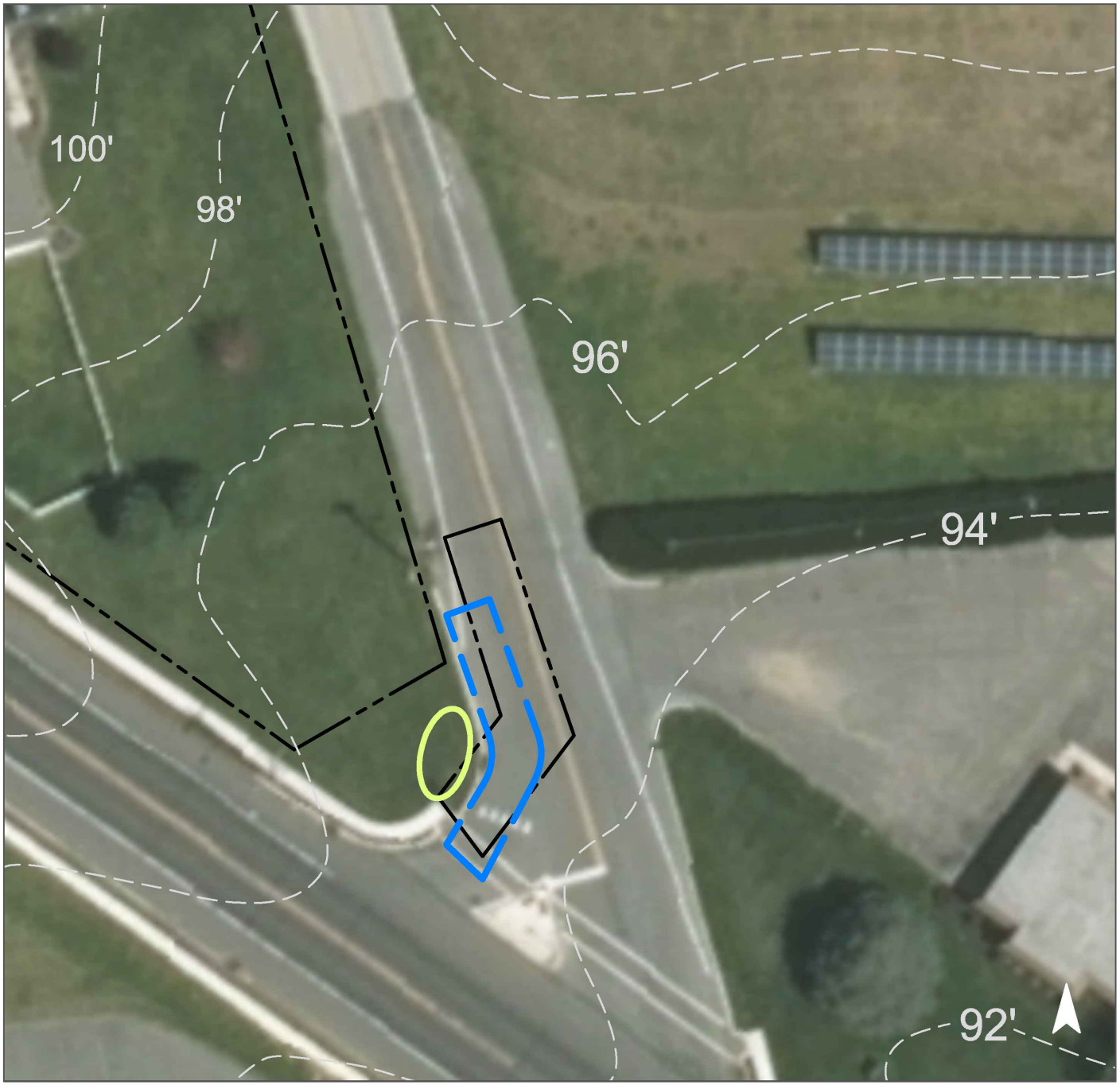
Block and Lot: Block n/a, Lot n/a

The turfgrass area is at a lower elevation than the road; curb cuts can be made to allow stormwater to flow into a rain garden. This system will manage stormwater runoff from the road, enhance the aesthetic of the area, and create a habitat for wildlife. 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"
95.0	1,411	0.1	0.7	6.5	0.001	0.04

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	0.023	4	1,660	0.06	220	$1,100

GREEN INFRASTRUCTURE RECOMMENDATIONS



Roadside at 866 Main Street

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

0 20' 40'

Shiloh Fire Department

Subwatershed: Barrett Run

Site Area: 41,335 sq. ft.

Address: 900 Main Street
Shiloh, NJ 08353

Block and Lot: Block 10, Lot 6

A rain garden can be installed behind the sign to capture runoff from the roof. At the east side of the building, cisterns can be installed to store stormwater runoff from the roof to be reused for multiple purposes such as washing vehicles. 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"
72.4	29,936	1.4	15.1	137.4	0.023	0.82

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	0.027	5	1,990	0.07	260	$1,300
Rainwater harvesting	0.041	7	1,200	0.05	1,200 (gal)	$2,400

GREEN INFRASTRUCTURE RECOMMENDATIONS

Shiloh Fire Department

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

0 25' 50'

Shiloh Medical Group

Subwatershed: Barrett Run

Site Area: 36,866 sq. ft.

Address: 851 Main Street
Shiloh, NJ 08353

Block and Lot: Block 12, Lot 5

A rain garden can be installed in the turfgrass area to capture, treat, and infiltrate stormwater runoff from 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"
49.5	18,267	0.9	9.2	83.9	0.014	0.50

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	0.157	26	11,530	0.43	1,510	$7,550

GREEN INFRASTRUCTURE RECOMMENDATIONS

Shiloh Medical Group

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

0 25' 50'

Roadside at 194 East Avenue

Subwatershed: Cohansey River

Site Area: 7,168 sq. ft.

Address: 194 East Avenue
Shiloh, NJ 08353

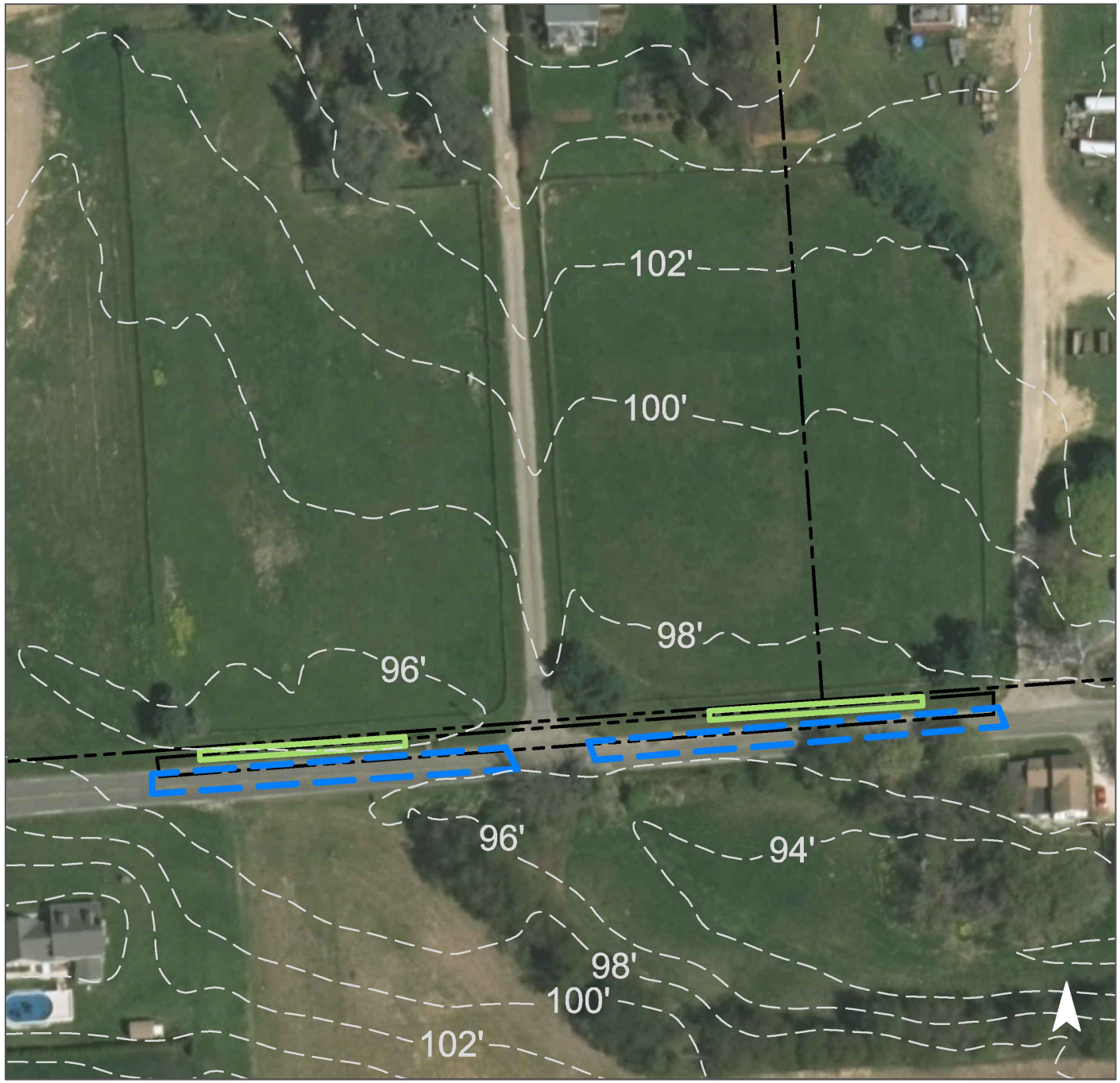
Block and Lot: Block 13, Lot 4

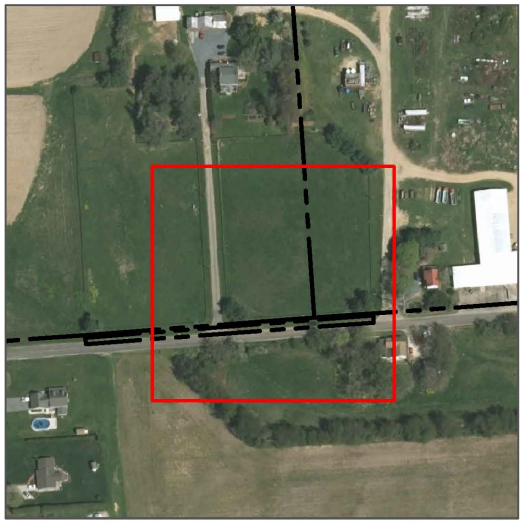
Bioswales can be installed along the fence pictured above to capture stormwater runoff from the road. The turfgrass areas alongside the road are eroding due to the flow of the runoff. These areas are also at a lower depth than that of the road, which would allow the stormwater to flow into the bioswales. 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"
94.49	6,774	0.3	3.4	31.1	0.005	0.19

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
Bioswales	0.086	21	6,170	0.07	1,650	$8,250

GREEN INFRASTRUCTURE RECOMMENDATIONS





Roadside at 194 East Avenue

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

0 50' 100'

Roadside at 227 East Avenue

Subwatershed: Cohansey River

Site Area: 7,862 sq. ft.

Address: 227 East Avenue
Shiloh, NJ 08353

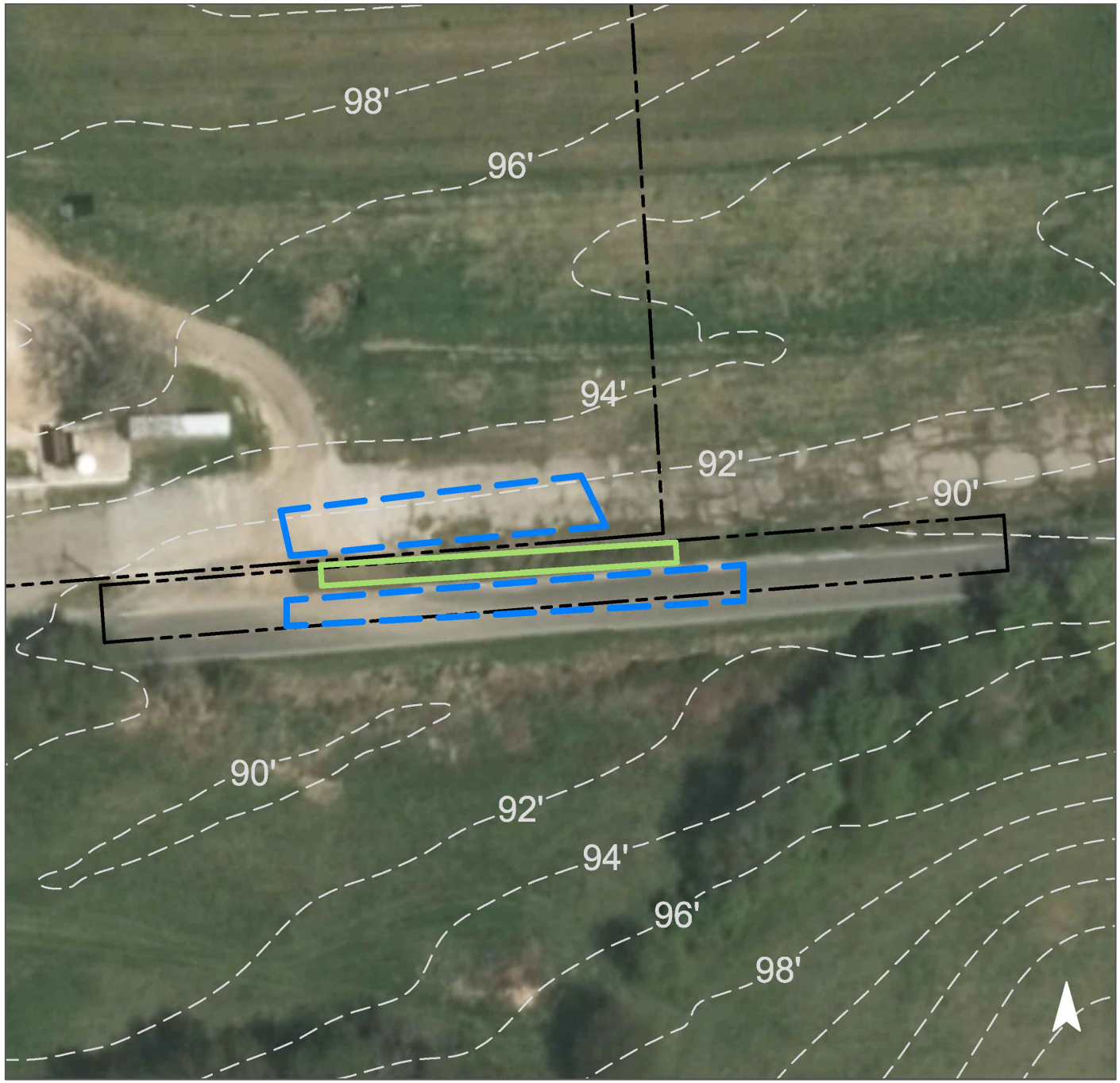
Block and Lot: Block 13, Lot 3

The turfgrass area alongside the road west of the building can be converted into a bioswale. Currently, the soil along the roadside is eroding and puddles with stormwater runoff accumulate here. This problem can be solved with the creation of a bioswale. 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"
58.0	4,560	0.2	2.3	20.9	0.004	0.13

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	0.059	14	4,230	0.04	1,130	$5,650

GREEN INFRASTRUCTURE RECOMMENDATIONS



Roadside at 227 East Avenue

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

0 30' 60'

Shiloh Market

Subwatershed: Cohansey River

Site Area: 48,696 sq. ft.

Address: 13 Roadstown Road
Shiloh, NJ 08353

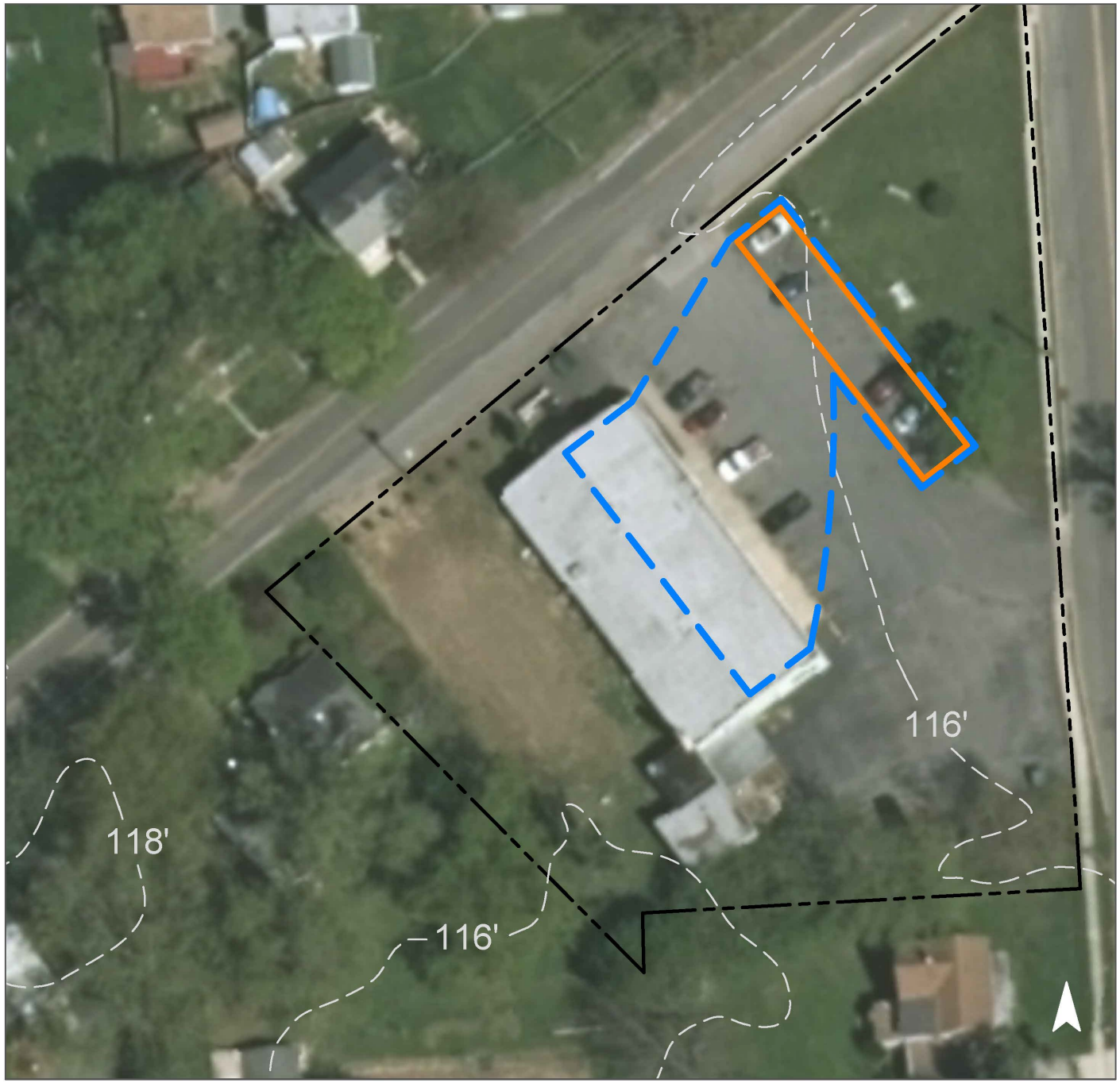
Block and Lot: Block 4, Lot 1

A section of parking spaces can be transformed into pervious pavement to allow water from the roof and pavement to infiltrate through the surface and assist in replenishing the aquifer. 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"
70.3	34,214	1.6	17.3	157.1	0.027	0.94

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	0.250	42	18,320	0.69	1,780	$44,500

GREEN INFRASTRUCTURE RECOMMENDATIONS



Shiloh Market

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

0 25' 50'

Shiloh Post Office

Subwatershed: Cohansey River

Site Area: 12,947 sq. ft.

Address: 966 Main Street
Shiloh, NJ 08353

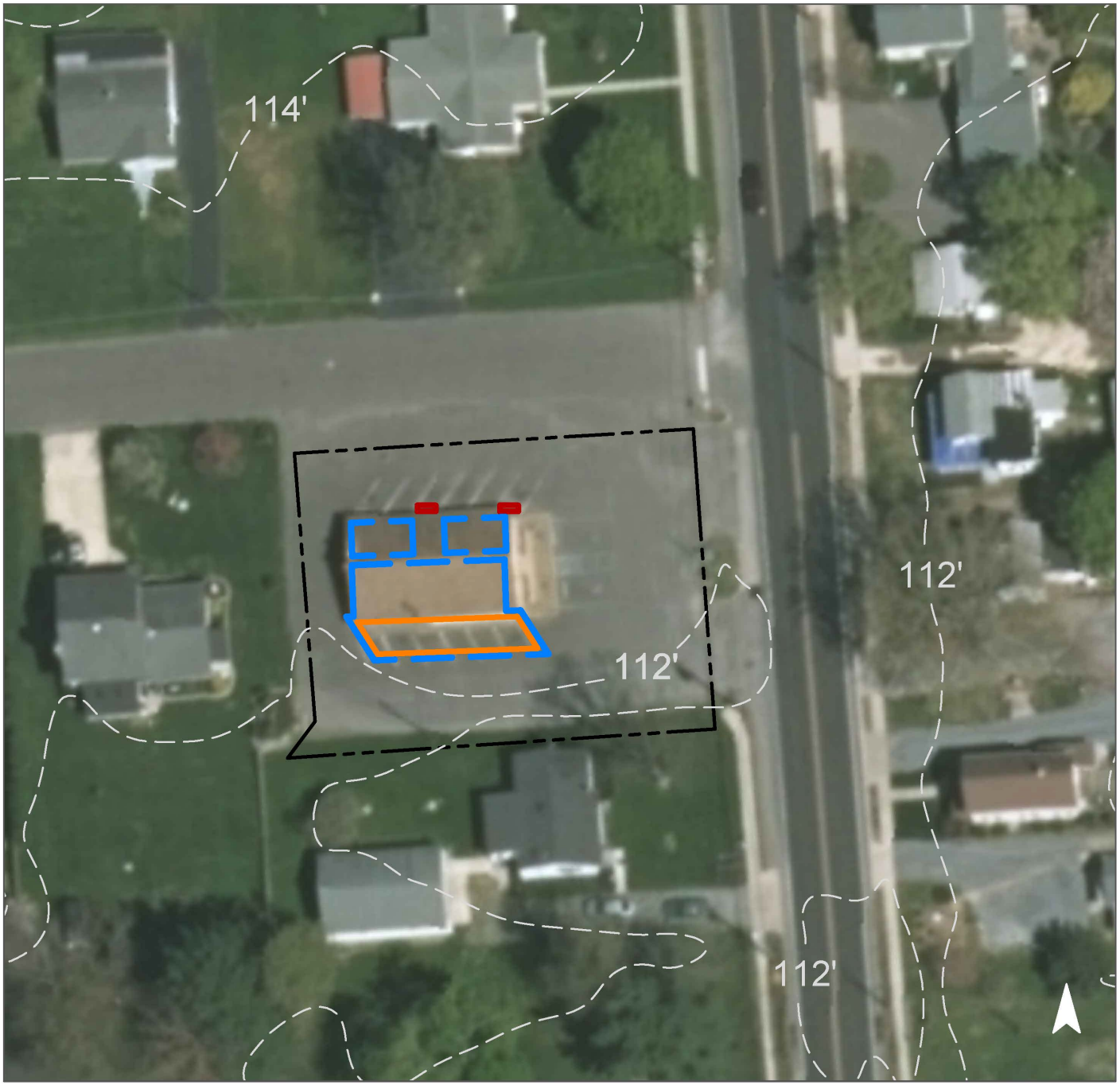
Block and Lot: Block 2, Lot 1

The parking spaces along the south side of the building can be converted into pervious pavement to allow stormwater runoff from the roof and pavement to infiltrate the ground. Downspout planter boxes can be installed on the north side of the building to capture runoff from the roof and enhance the aesthetic of the building. 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"
55.0	7,121	0.3	3.6	32.7	0.006	0.20

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	0.044	7	3,190	0.12	560	$14,000
Planter boxes	n/a	2	n/a	n/a	2 (boxes)	$2,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Shiloh Post Office

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

0 25' 50'

Shiloh Seventh Day Baptist Church

Subwatershed: Cohansey River

Site Area: 301,924 sq. ft.

Address: 116 East Avenue
Shiloh, NJ 08353

Block and Lot: Block 9, Lot 2

The parking spaces southwest of the building can be converted to pervious pavement to allow runoff from the roof and pavement to infiltrate through the surface. A rain garden can be installed in the front turfgrass area to capture, treat, and infiltrate runoff from the roof and 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"
21.3	64,186	3.1	32.4	294.7	0.050	1.76

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	0.092	15	6,750	0.25	880	$4,400
Pervious pavement	0.163	27	11,990	0.45	1,800	$21,375

GREEN INFRASTRUCTURE RECOMMENDATIONS

Shiloh Seventh Day Baptist Church

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

0 25' 50'

South Jersey Equestrian Center LLC

Subwatershed: Cohansey River

Site Area: 427,679 sq. ft.

Address: 712 Barretts Run Road
Shiloh, NJ 08353

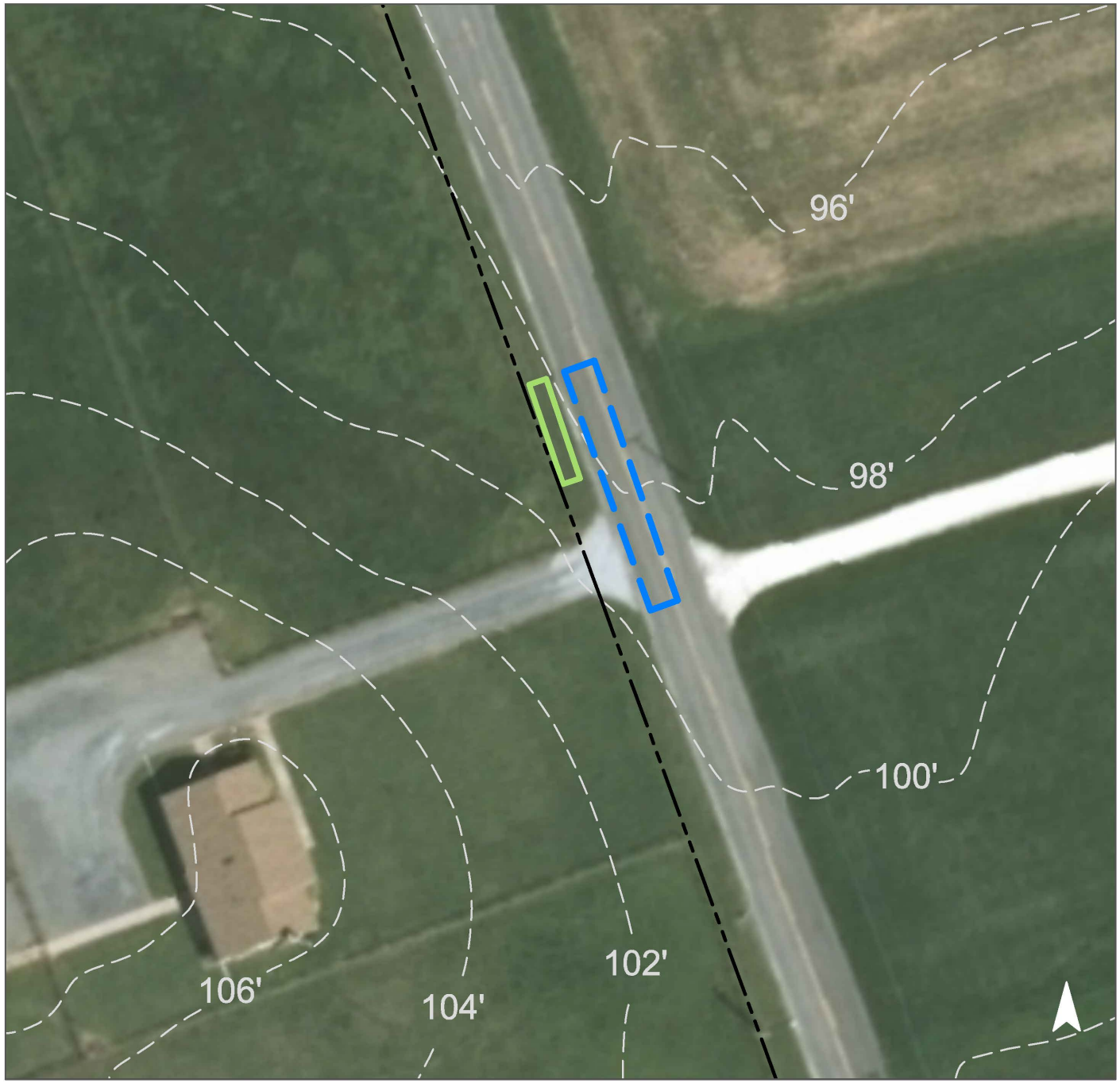
Block and Lot: Block 12, Lot 3

The turfgrass area north of the driveway alongside the road can be converted to a bioswale to capture stormwater runoff from the road. Additional benefits include enhancing the aesthetic of the area and providing a habitat for wildlife. 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"
9.3	39,767	1.9	20.1	182.6	0.031	1.09

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	0.011	3	790	0.01	210	$1,050

GREEN INFRASTRUCTURE RECOMMENDATIONS



South Jersey Equestrian Center LLC

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

0 25' 50'

b. Proposed Green Infrastructure Concepts

Summary of Existing Conditions

	Subwatershed/Site Name/Total Site Info/GI Practice	Area (ac)	Area (SF)	Block	Lot	I.C. %	I.C. Area (ac)	I.C. Area (SF)	Existing Annual Loads (Commercial) TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (cu.ft.)	Runoff Volumes from I.C. Annual (cu.ft.)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (Mgal)	Runoff Volumes from I.C. Annual (Mgal)
	BARRETT RUN	**1.88**	**81,868**				**1.19**	**51,687**	**2.5**	**26.1**	**237.3**	**5,384**	**189,518**	**0.040**	**1.42**
1	**Roadside at 805 Main Street**														
	Total Site Info	0.05	2,182	n/a	n/a	95.0	0.05	2,073	0.1	1.0	9.5	216	7,601	0.002	0.06
2	**Roadside at 866 Main Street**														
	Total Site Info	0.03	1,485	n/a	n/a	95.0	0.03	1,411	0.1	0.7	6.5	147	5,173	0.001	0.04
3	**Shiloh Fire Department**														
	Total Site Info	0.95	41,335	10	6	72.4	0.69	29,936	1.4	15.1	137.4	3,118	109,767	0.023	0.82
4	**Shiloh Medical Group**														
	Total Site Info	0.85	36,866	12	5	49.5	0.42	18,267	0.9	9.2	83.9	1,903	66,978	0.014	0.50
	COHANSEY RIVER	**18.51**	**806,277**				**3.60**	**156,622**	**7.6**	**79.1**	**719.1**	**16,315**	**574,280**	**0.122**	**4.30**
5	**Roadside at 194 East Avenue**														
	Total Site Info	0.16	7,168	n/a	n/a	94.49	0.16	6,774	0.3	3.4	31.1	706	24,837	0.005	0.19
6	**Roadside at 227 East Avenue**														
	Total Site Info	0.18	7,862	n/a	n/a	58.0	0.10	4,560	0.2	2.3	20.9	475	16,720	0.004	0.13
7	**Shiloh Market**														
	Total Site Info	1.12	48,696	4	1	70.3	0.79	34,214	1.6	17.3	157.1	3,564	125,452	0.027	0.94
8	**Shiloh Post Office**														
	Total Site Info	0.30	12,947	2	1	55.0	0.16	7,121	0.3	3.6	32.7	742	26,110	0.006	0.20
9	**Shiloh Seventh Day Baptist Church**														
	Total Site Info	6.93	301,924	9	2	21.3	1.47	64,186	3.1	32.4	294.7	6,686	235,348	0.050	1.76
10	**South Jersey Equestrian Center LLC**														
	Total Site Info	9.82	427,679	12	3	9.3	0.91	39,767	1.9	20.1	182.6	4,142	145,813	0.031	1.09

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	Unit Cost ($/unit)	Unit	Total Cost ($)	I.C. Treated %
	BARRETT RUN	**10,940**	**0.25**	**0.266**	**46**	**17,730**	**0.62**				**$14,150**	**21.2%**
1	**Roadside at 805 Main Street**											
	Bioswale	1,430	0.03	0.019	4	1,350	0.01	360	$5	SF	$1,800	69.0%
	Total Site Info	**1,430**	**0.03**	**0.019**	**4**	**1,350**	**0.01**				**$1,800**	**69.0%**
2	**Roadside at 866 Main Street**											
	Bioretention system	870	0.02	0.023	4	1,660	0.06	220	$5	SF	$1,100	61.7%
	Total Site Info	**870**	**0.02**	**0.023**	**4**	**1,660**	**0.06**				**$1,100**	**61.7%**
3	**Shiloh Fire Department**											
	Bioretention system	1,040	0.02	0.027	5	1,990	0.07	260	$5	SF	$1,300	3.5%
	Rainwater harvesting	1,570	0.04	0.041	7	1,200	0.05	1,200	$2	gal	$2,400	5.2%
	Total Site Info	**2,610**	**0.06**	**0.068**	**11**	**3,190**	**0.12**				**$3,700**	**8.7%**
4	**Shiloh Medical Group**											
	Bioretention system	6,030	0.14	0.157	26	11,530	0.43	1,510	$5	SF	$7,550	33.0%
	Total Site Info	**6,030**	**0.14**	**0.157**	**26**	**11,530**	**0.43**				**$7,550**	**33.0%**
	COHANSEY RIVER	**29,890**	**0.69**	**0.612**	**115**	**44,690**	**1.38**				**$120,450**	**19.1%**
5	**Roadside at 194 East Avenue**											
	Bioswales	6,590	0.15	0.086	21	6,170	0.07	1,650	$5	SF	$8,250	97.3%
	Total Site Info	**6,590**	**0.15**	**0.086**	**21**	**6,170**	**0.07**				**$8,250**	**97%**
6	**Roadside at 227 East Avenue**											
	Bioswale	4,520	0.10	0.059	14	4,230	0.04	1,130	$5	SF	$5,650	99.1%
	Total Site Info	**4,520**	**0.10**	**0.059**	**14**	**4,230**	**0.04**				**$5,650**	**99.1%**
7	**Shiloh Market**											
	Pervious pavement	9,580	0.22	0.250	42	18,320	0.69	1,780	$25	SF	$44,500	28.0%
	Total Site Info	**9,580**	**0.22**	**0.250**	**42**	**18,320**	**0.69**				**$44,500**	**28.0%**
8	**Shiloh Post Office**											
	Pervious pavement	1,670	0.04	0.044	7	3,190	0.12	560	$25	SF	$14,000	23.5%
	Planter boxes	430	0.01	n/a	2	n/a	n/a	2	$1,000	box	$2,000	6.0%
	Total Site Info	**2,100**	**0.05**	**0.044**	**9**	**3,190**	**0.12**				**$16,000**	**29.5%**

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	Unit Cost ($/unit)	Unit	Total Cost ($)	I.C. Treated %
9	**Shiloh Seventh Day Baptist Church**											
	Bioretention system	3,530	0.08	0.092	15	6,750	0.25	880	$5	SF	$4,400	5.5%
	Pervious pavement	6,270	0.14	0.163	27	11,990	0.45	1,800	$25	SF	$45,000	9.8%
	Total Site Info	**6,270**	**0.14**	**0.163**	**27**	**11,990**	**0.45**				**$45,000**	**15.3%**
10	**South Jersey Equestrian Center LLC**											
	Bioswale	830	0.02	0.011	3	790	0.01	210	$5	SF	$1,050	2.1%
	Total Site Info	**830**	**0.02**	**0.011**	**3**	**790**	**0.01**				**$1,050**	**2.1%**