RUTGERS
New Jersey Agricultural
Experiment Station

Impervious Cover Reduction Action Plan
for
Sparta Township, Sussex County, New Jersey

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

March 23, 2021

ACKNOWLEDGEMENTS:

This document has been prepared by the Rutgers Cooperative Extension Water Resources Program, with funding and direction from the National Fish and Wildlife Foundation [NFWF GRANT ID: 0403.19.065576] and the New Jersey Agricultural Experiment Station, to highlight green infrastructure opportunities within Sparta Township. We would like to thank the National Fish and Wildlife Foundation, the New Jersey Agricultural Experiment Station, and Sparta Township for their input and support in creating this document.

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New Jersey Agricultural Experiment Station

NATIONAL FISH AND WILDLIFE FOUNDATION NFWF

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Introduction

Located in Sussex County, New Jersey, Sparta Township covers approximately 38.8 square miles. Figures 1 and 2 illustrate that Sparta Township is dominated by forest land use. A total of 28.8% of the municipality's land use is classified as urban. Of the urban land in Sparta Township, rural residential is the dominant land use (Figure 3).

The New Jersey Department of Environmental Protection's (NJDEP) 2015 land use/land cover geographical information system (GIS) data layer categorizes Sparta 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 Sparta Township. Based upon the 2015 NJDEP land use/land cover data, approximately 10.4% of Sparta Township has impervious cover. This level of impervious cover suggests that the streams in Sparta Township likely range from sensitive to impacted streams. [1]

Methodology

Sparta Township contains portions of ten subwatersheds (Figure 4). For this impervious cover reduction action plan, projects have been identified in two of these subwatersheds. 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] Schuler, T.R., L. Fraley-McNeal, and K. Cappiella. 2009. Is Impervious Cover Still Important? Review of Recent Research. *Journal of Hydrologic Engineering* 14 (4): 309-315.

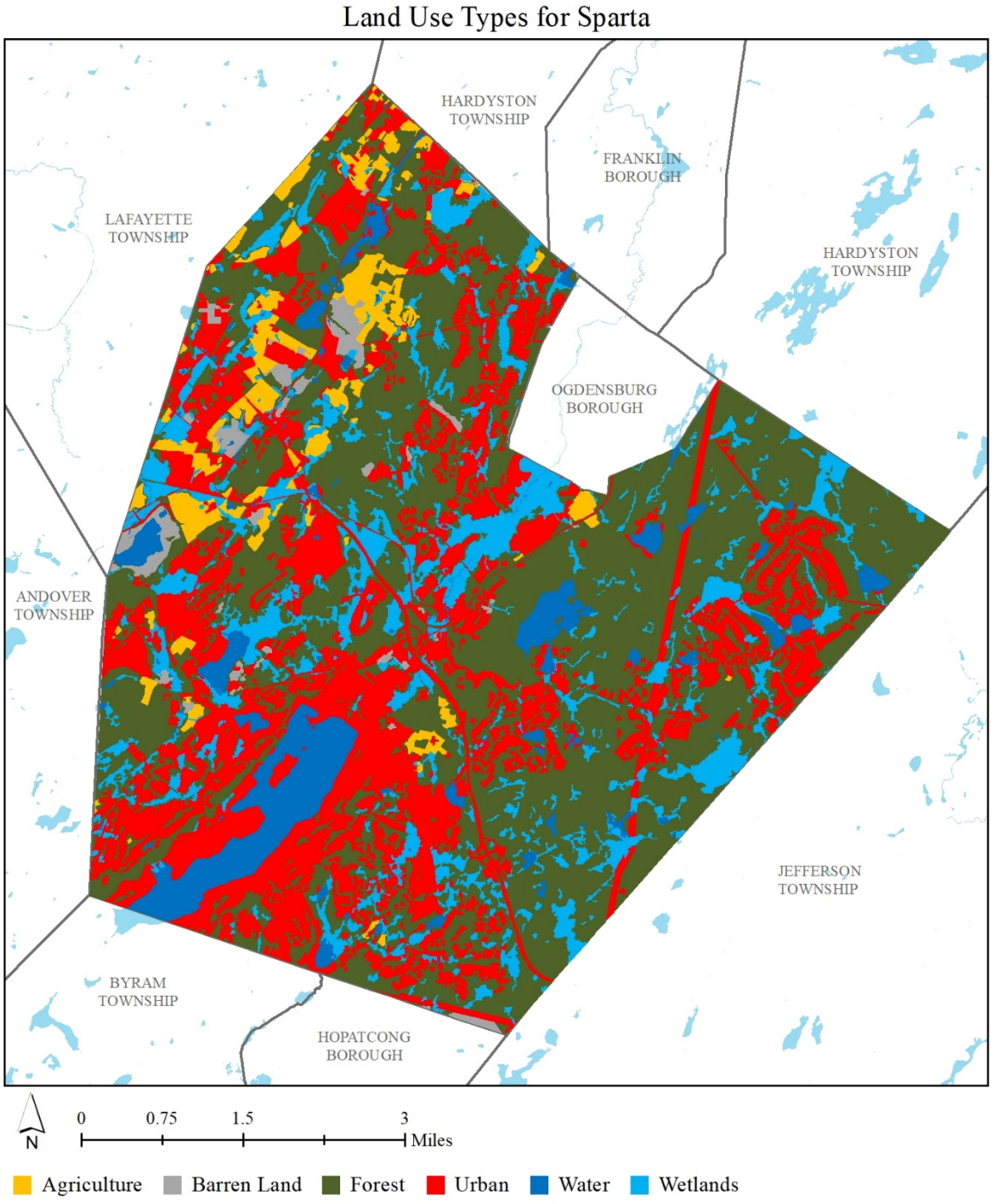


Figure 1: Map illustrating the land use in Sparta Township

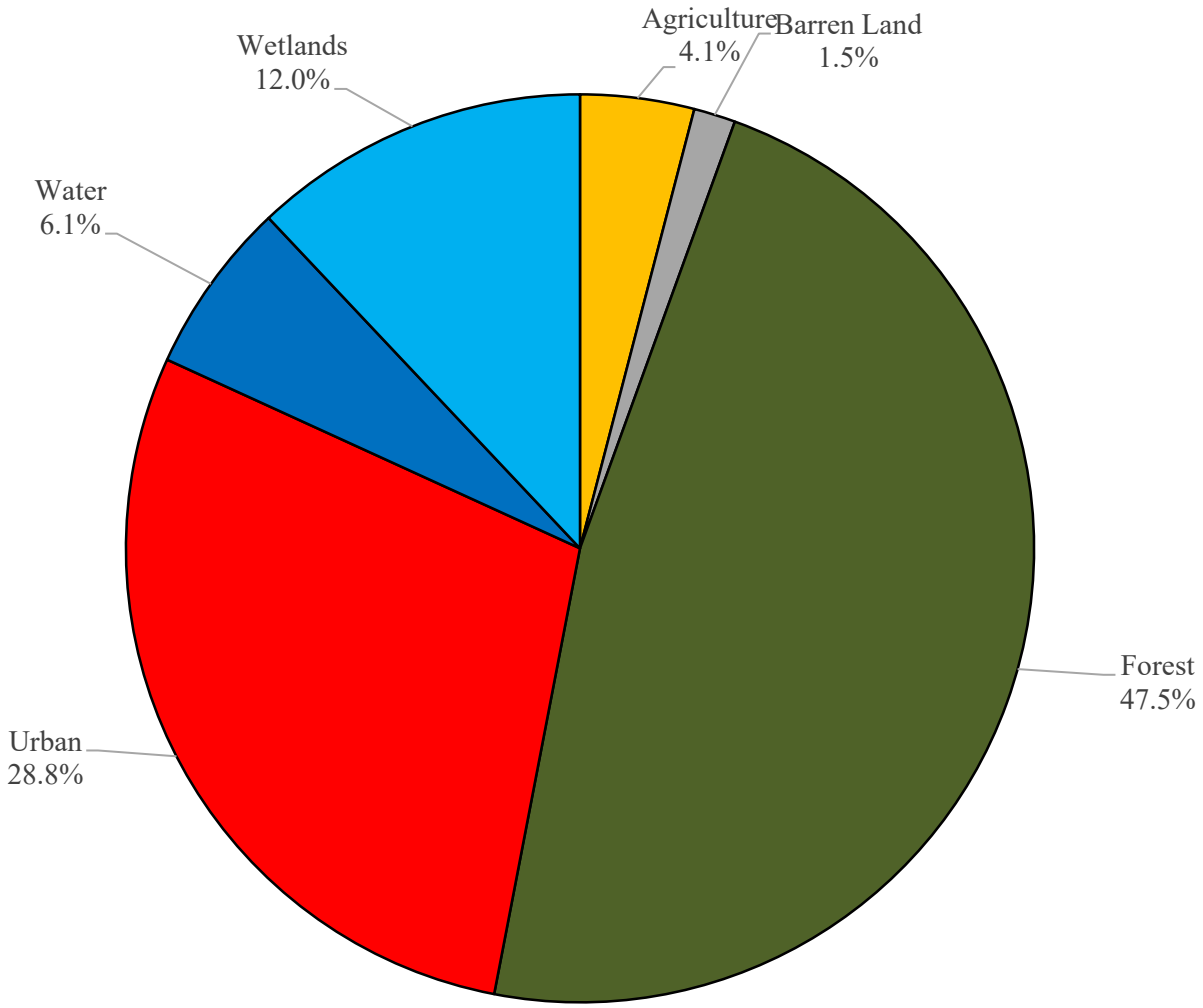


Figure 2: Pie chart illustrating the land use in Sparta Township

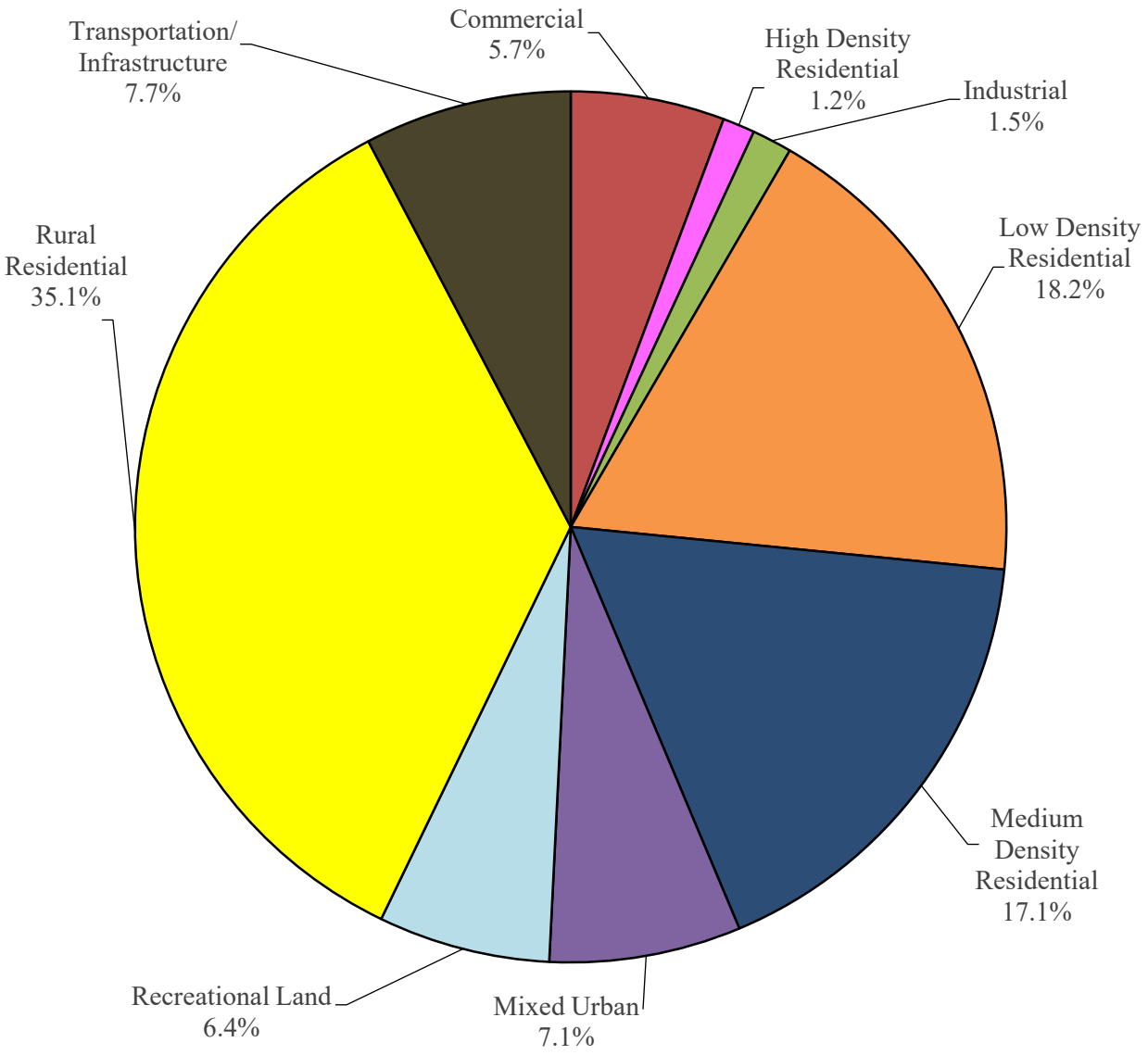


Figure 3: Pie chart illustrating the various types of urban land use in Sparta Township

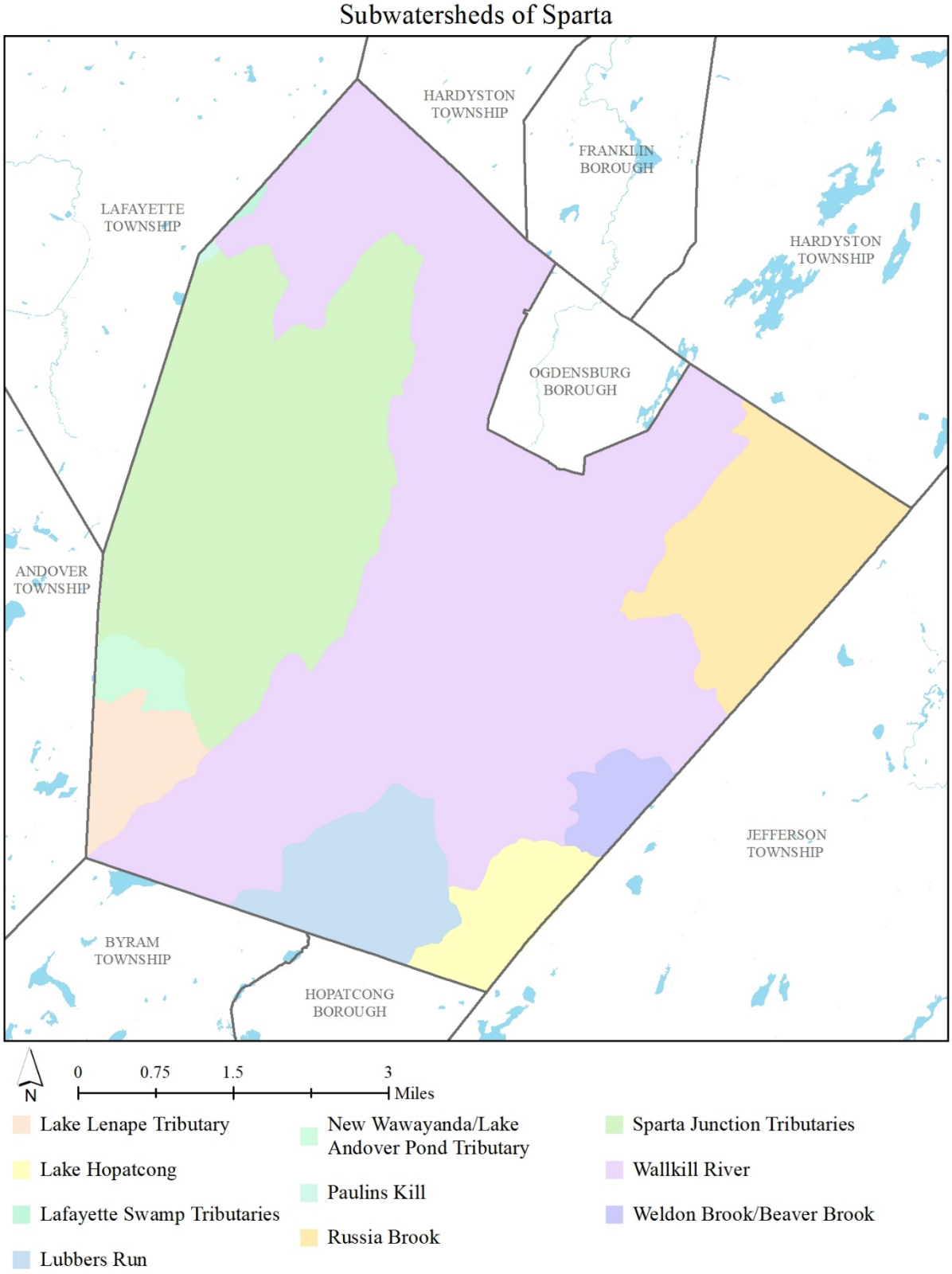


Figure 4: Map of the subwatersheds in Sparta Township

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 2015 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 Sparta 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 principle, 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 Sparta 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.

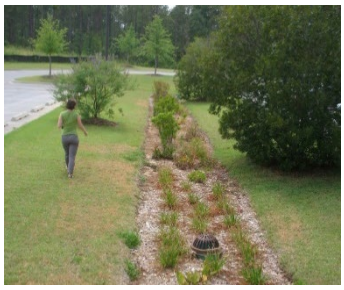
Downspout planter boxes

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

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

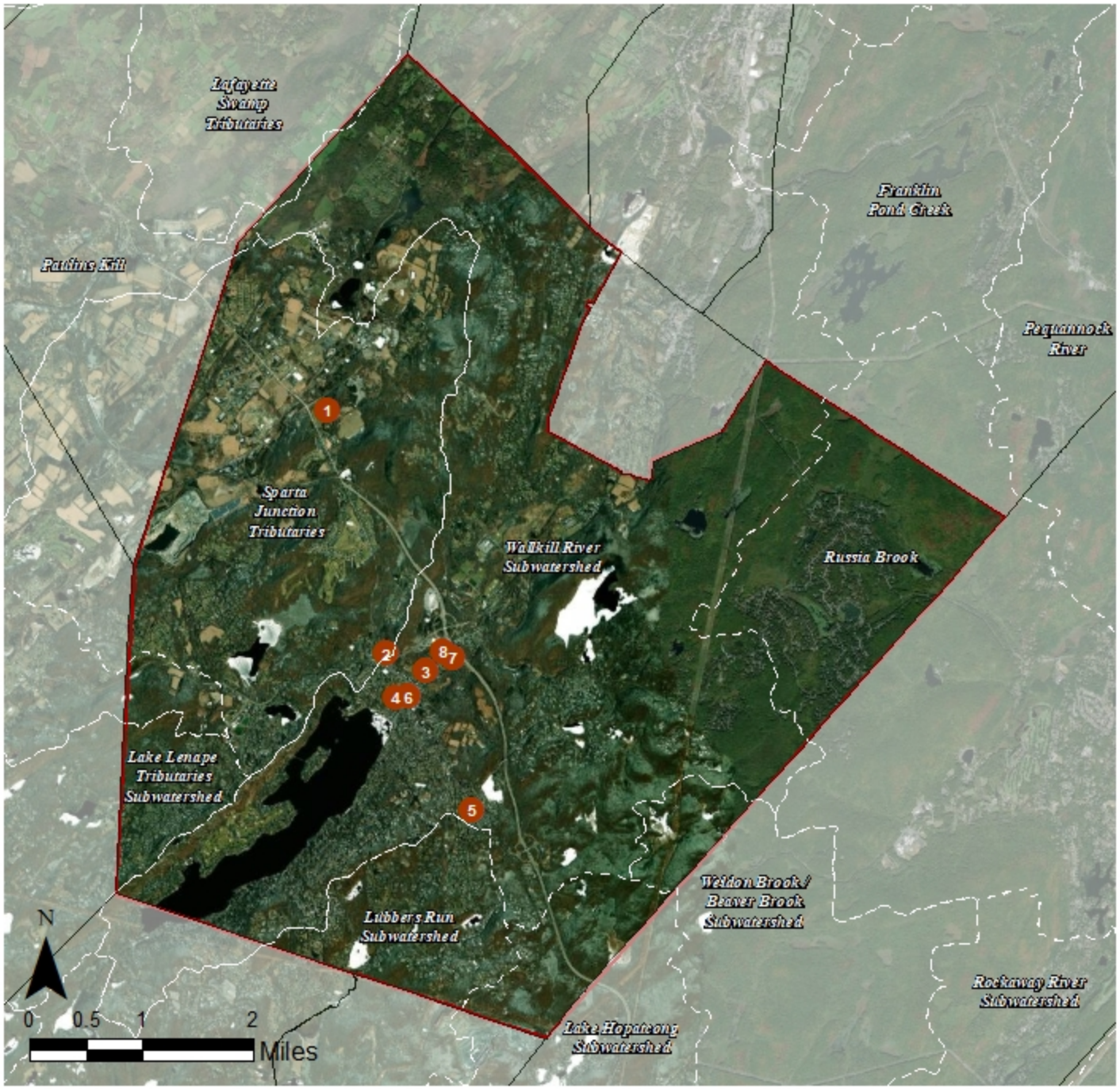
This impervious cover reduction action plan is meant to provide the municipality with a blueprint for implementing green infrastructure practices that will reduce the impact of stormwater runoff from impervious surfaces. These projects can be implemented by a wide variety of people such as boy scouts,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

SPARTA TOWNSHIP: GREEN INFRASTRUCTURE SITES



SITES WITHIN THE SPARTA JUNCTION TRIBUTARIES SUBWATERSHED

1. Sparta Evangelical Free Church
2. Sparta United Methodist Church

SITES WITHIN THE WALLKILL RIVER SUBWATERSHED

3. First Presbyterian Church of Sparta
4. Mohawk Avenue School
5. Shepard of the Hills Lutheran Church
6. Sparta Public Library
7. Sparta Township Police Department
8. Veterans of Foreign Wars Post #7248

b. Proposed Green Infrastructure Concepts

SPARTA EVANGELICAL FREE CHURCH

Subwatershed: Sparta Junction Tributaries

Site Area: 702,345 sq. ft.

Address: 385 Houses Corner Road Sparta, NJ 07871

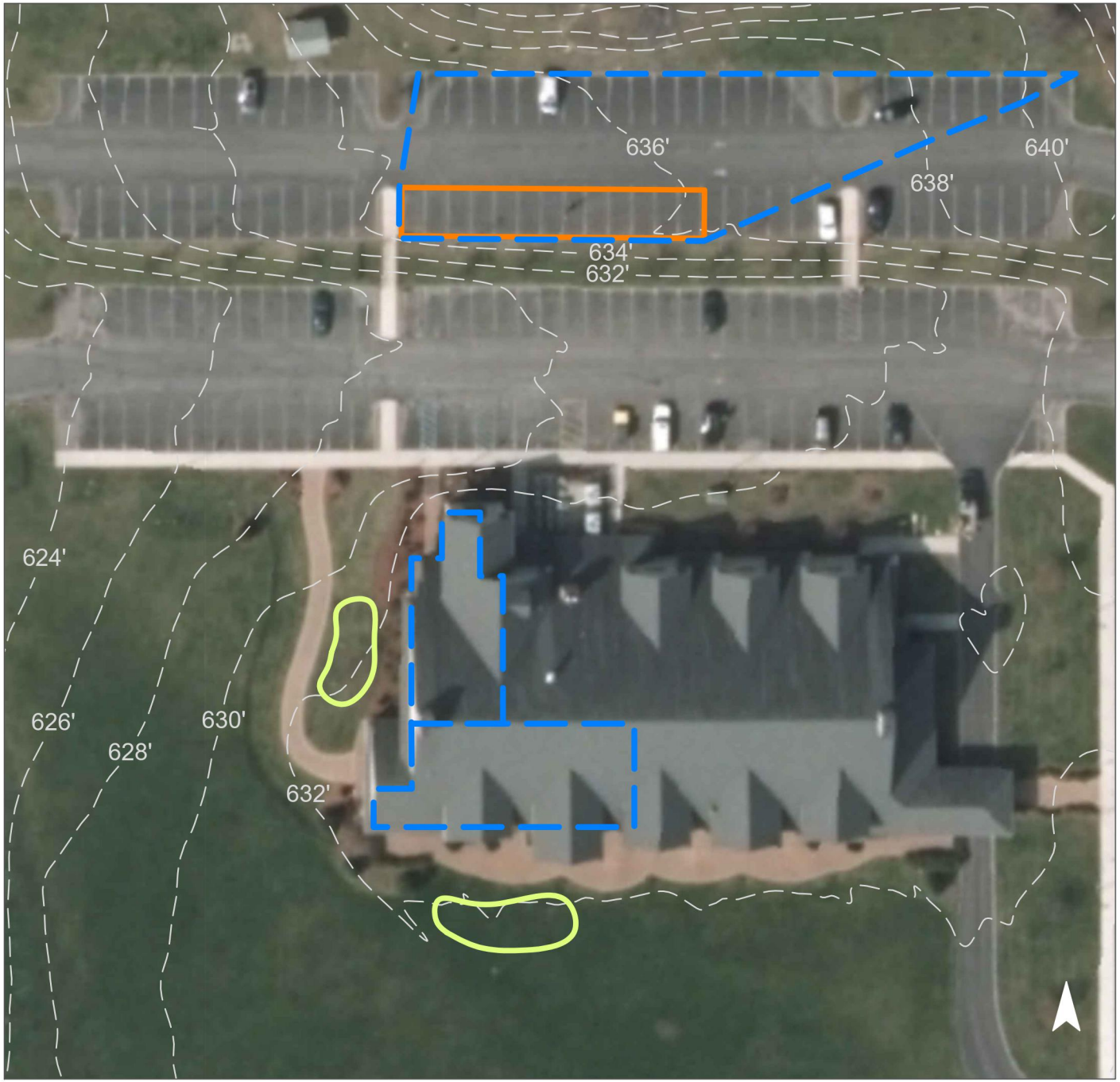
Block and Lot: Block 17001, Lot 3

Parking spaces in the parking lot to the north of the building can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot and the street. Two rain gardens can be installed southwest of the building to capture, treat, and infiltrate stormwater runoff from the roof. 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	243,690	11.7	123.1	1,118.9	0.190	6.68

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	0.165	28	11,710	0.44	1,585	$7,925
Pervious pavement	0.328	55	23,250	0.87	2,400	$60,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Sparta Evangelical Free Church

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

0 30' 60'

SPARTA UNITED METHODIST CHURCH

Subwatershed: Sparta Junction Tributaries

Site Area: 223,530 sq. ft.

Address: 71 South Sparta Avenue
Sparta, NJ 07871

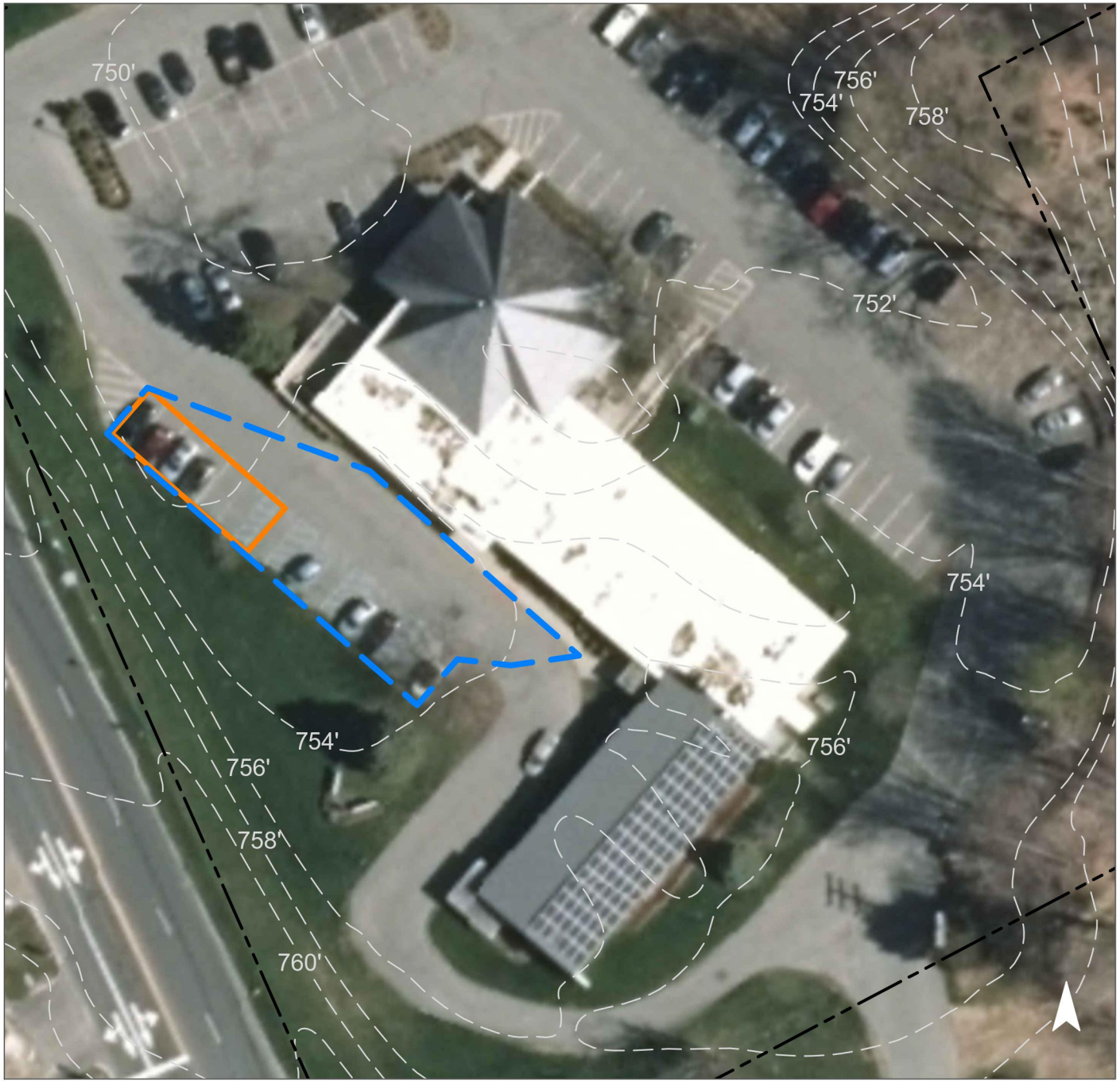
Block and Lot: Block 10002, Lot 1*

Parking spaces in the parking lot to the southwest of the building can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot and the street and roof top. 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"
41	92,305	4.4	46.6	423.8	0.072	2.53

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	0.152	25	10,800	0.41	1,200	$30,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Sparta United Methodist Church

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

0 25' 50'

FIRST PRESBYTERIAN CHURCH OF SPARTA

Subwatershed: Wallkill River

Site Area: 214,825 sq. ft.

Address: 32 Main Street
Sparta, NJ 07871

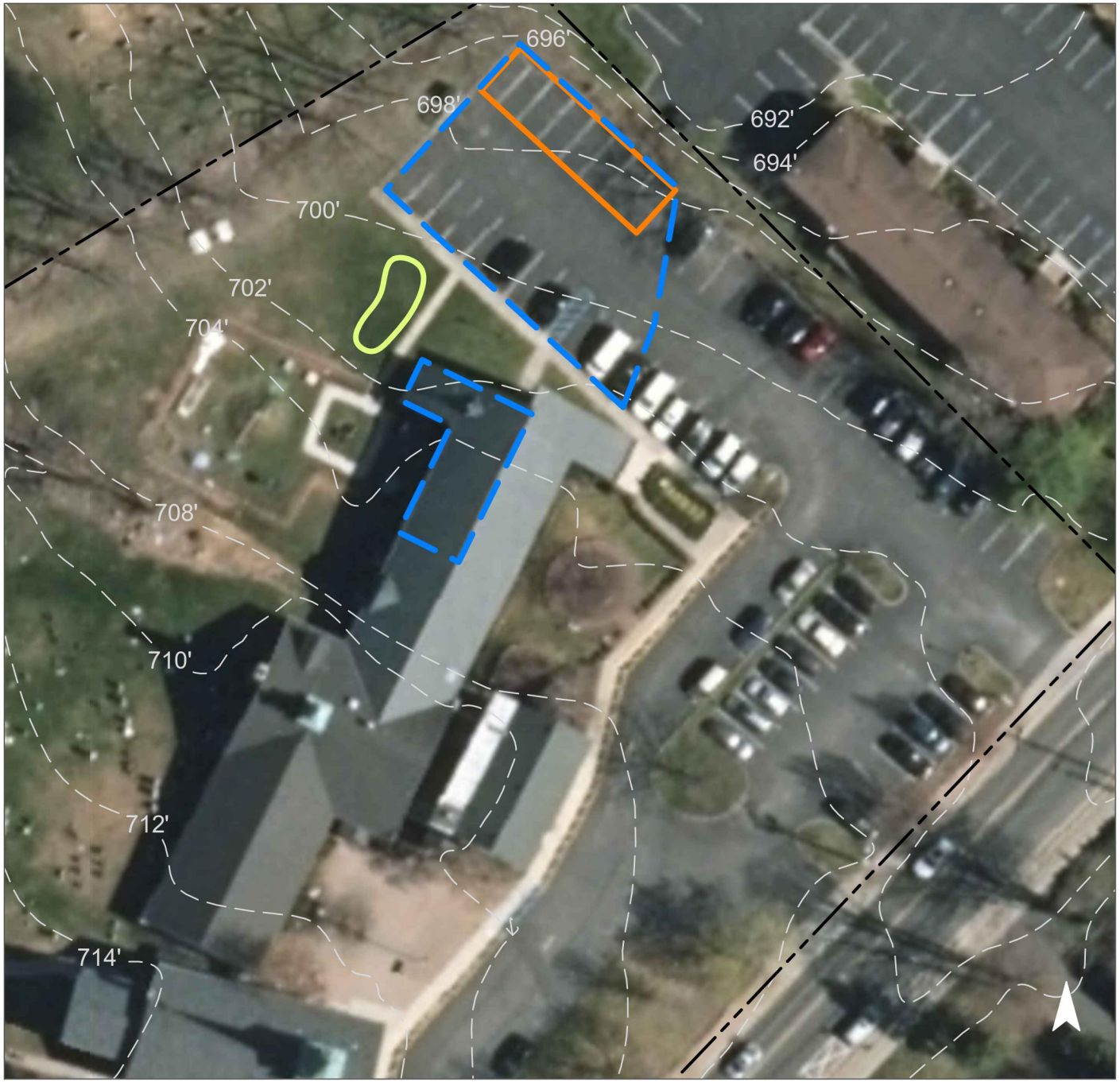
Block and Lot: Block 5019, Lot 7

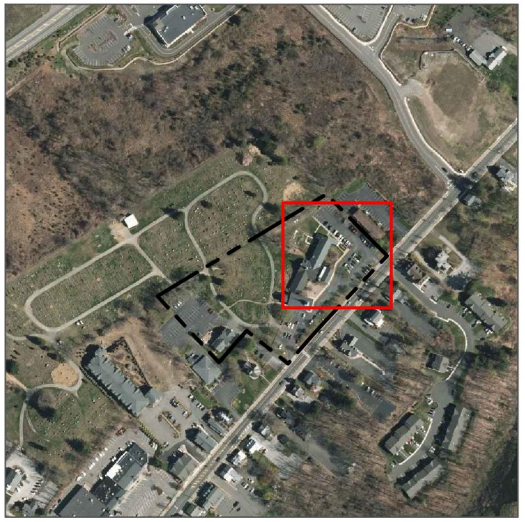
Parking spaces in the parking lot to the northeast of the building can be converted to porous pavement to capture and infiltrate stormwater runoff from the parking lot. A rain garden can be installed in the turfgrass area near the entrance of the building to capture, treat, and infiltrate stormwater runoff from the roof. 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"
51	108,540	5.2	54.8	498.3	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 system	0.038	6	2,700	0.10	365	$1,825
Pervious pavement	0.152	25	10,760	0.40	1,400	$35,000

GREEN INFRASTRUCTURE RECOMMENDATIONS





First Presbyterian Church of Sparta

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

0 25' 50'

MOHAWK AVENUE SCHOOL

Subwatershed: **Wallkill River**

Site Area: **302,8010 sq. ft.**

Address: **18 Mohawk Avenue**
Sparta, NJ 07871

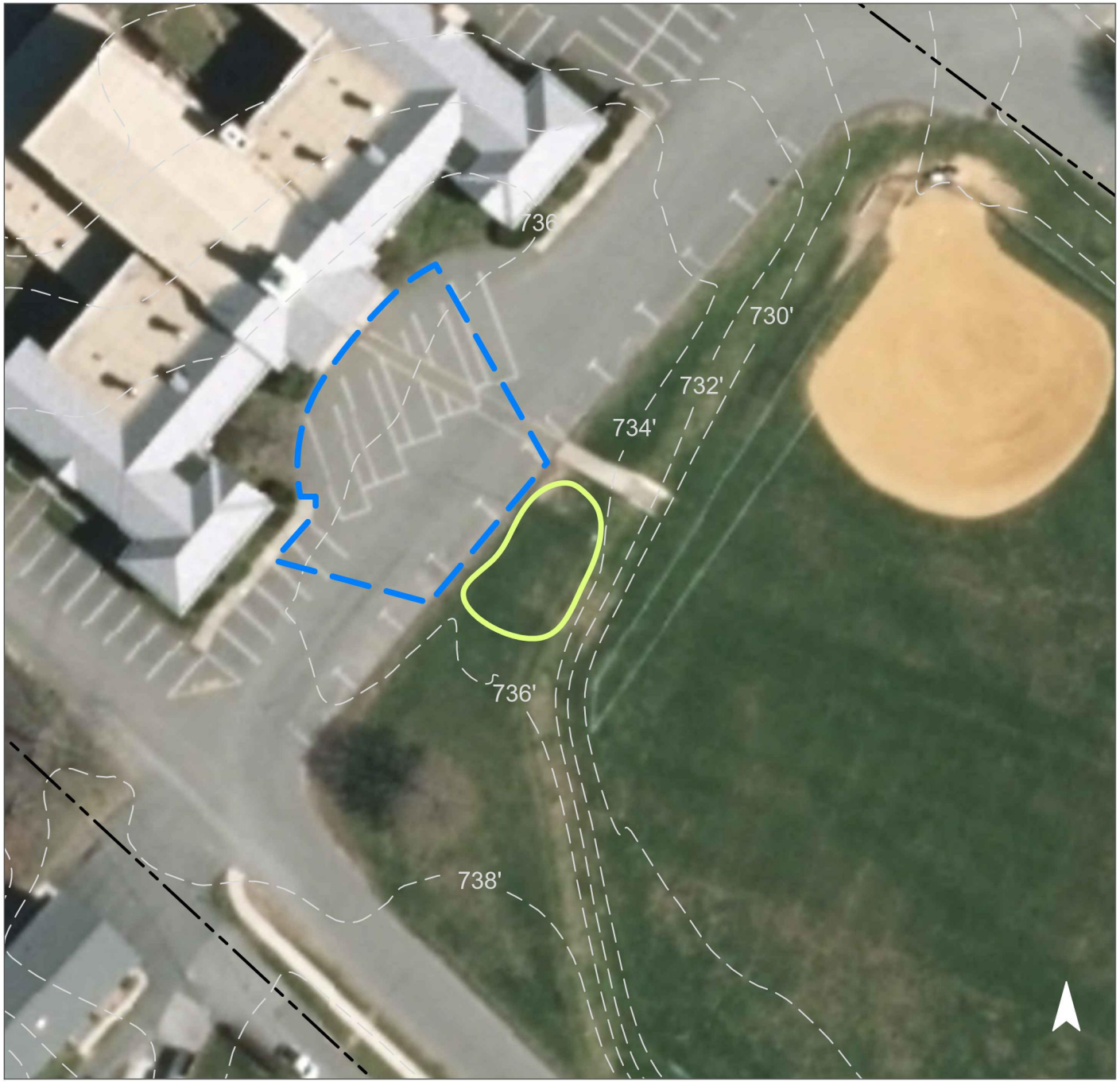
Block and Lot: **Block 5016, Lot 57**

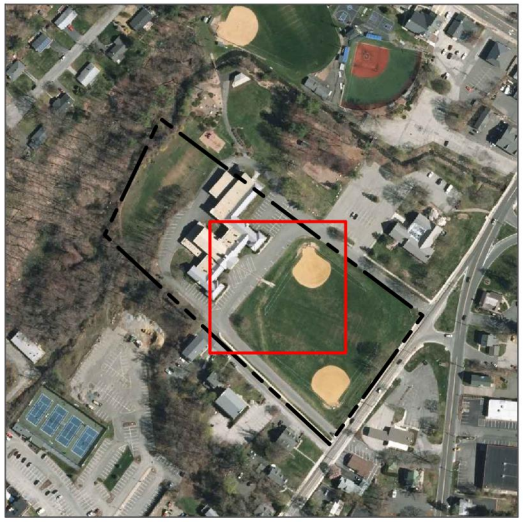
A rain garden can be installed in the turfgrass area near the east of the building across the pavement to capture, treat, and infiltrate stormwater runoff from the parking lot. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for 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"
38	116,065	5.6	58.6	532.9	0.090	3.18

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 system	0.150	25	10,640	0.40	1,440	$7,200

GREEN INFRASTRUCTURE RECOMMENDATIONS





Mohawk Avenue School

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

0 25' 50'

SHEPHERD OF THE HILLS LUTHERAN CHURCH

Subwatershed: Wallkill River

Site Area: 198,580 sq. ft.

Address: 246 Woodport Road
Sparta, NJ 07871

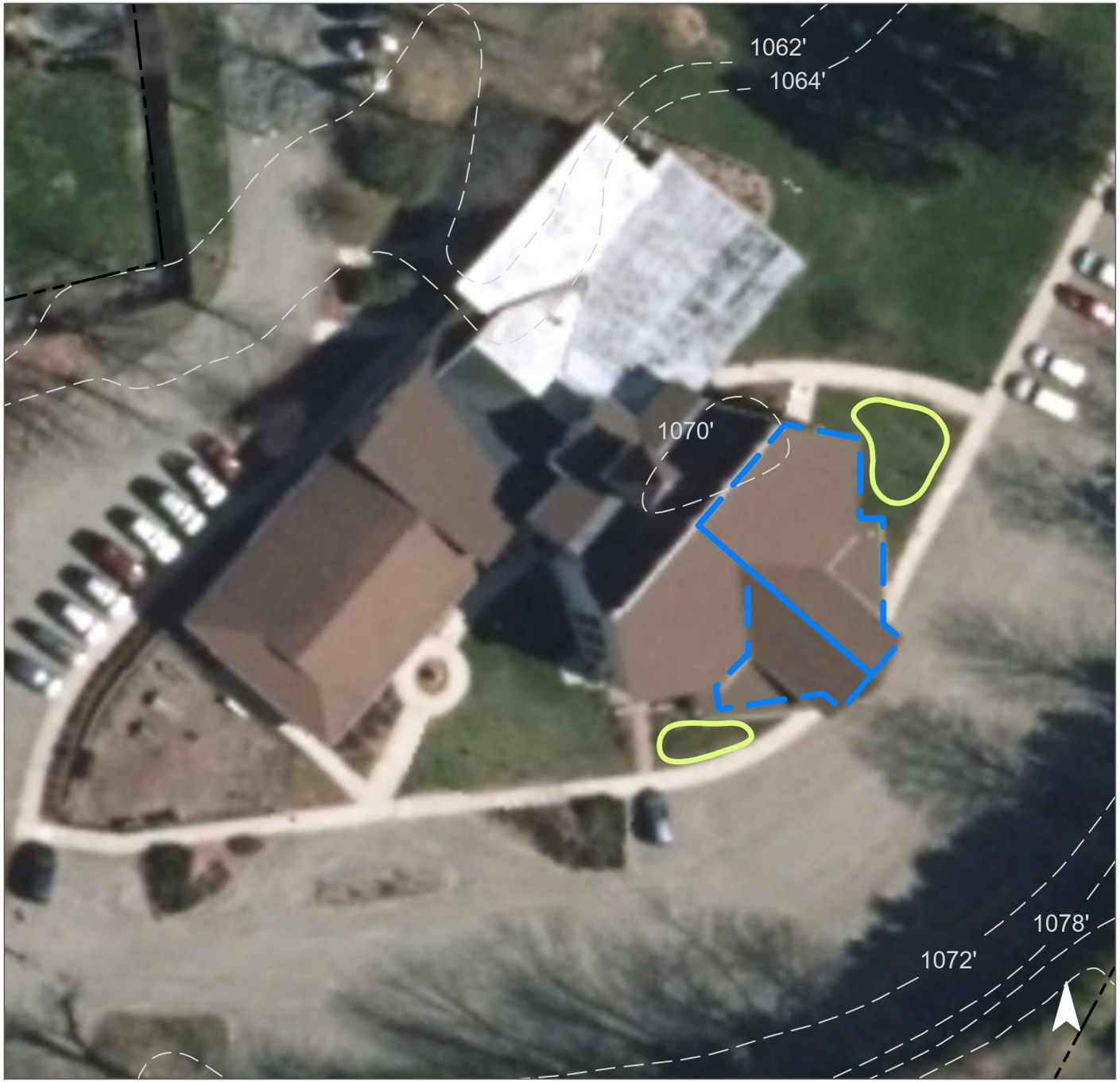
Block and Lot: Block 2103, Lot 10

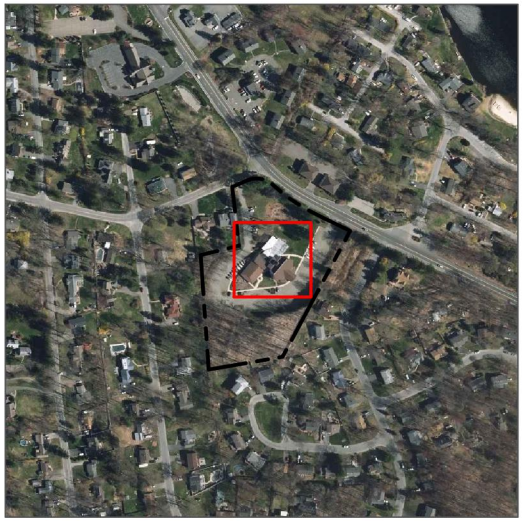
Two rain gardens can be installed near the entrance of the building to capture, treat, and infiltrate stormwater runoff from the roof. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

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"
45	90,105	4.3	45.5	413.7	0.070	2.47

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	0.066	11	4,720	0.18	630	$3,150

GREEN INFRASTRUCTURE RECOMMENDATIONS





Shepherd of the Hills Lutheran Church

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

0 20' 40'

SPARTA PUBLIC LIBRARY

Subwatershed: Wallkill River

Site Area: 32,185 sq. ft.

Address: 22 Woodport Road
Sparta, NJ 07871

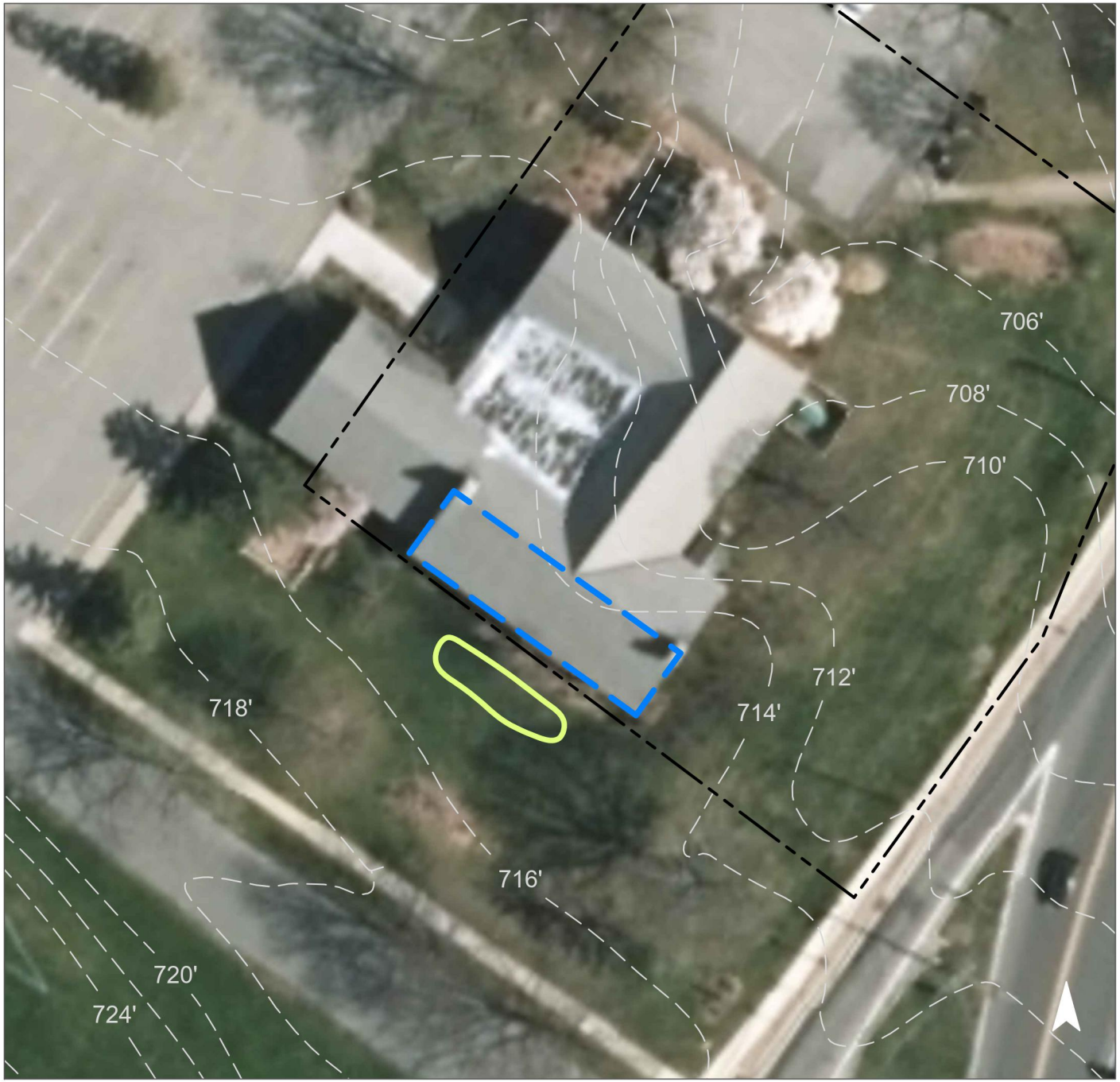
Block and Lot: Block 5016, Lot 55

A rain garden can be installed southwest of the building to capture, treat, and infiltrate stormwater runoff from the roof. 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"
66	21,270	1.0	10.7	97.7	0.017	0.58

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	0.038	6	2,700	0.10	365	$1,825

GREEN INFRASTRUCTURE RECOMMENDATIONS



Sparta Public Library

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

0 20' 40'

SPARTA TOWNSHIP POLICE DEPARTMENT

Subwatershed: Wallkill River

Site Area: 110,655 sq. ft.

Address: 65 Main Street
Sparta, NJ 07871

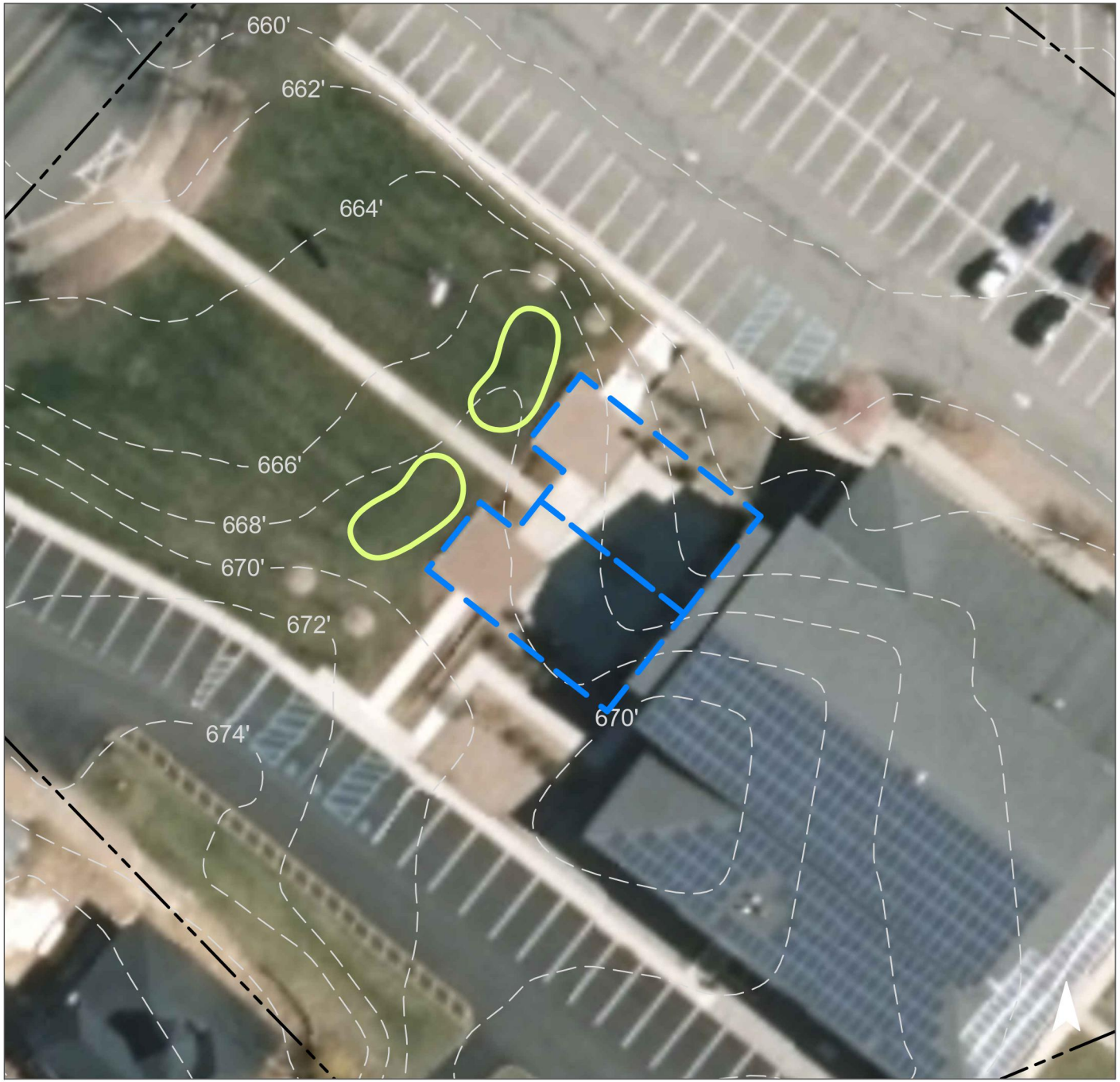
Block and Lot: Block 2001, Lot 50

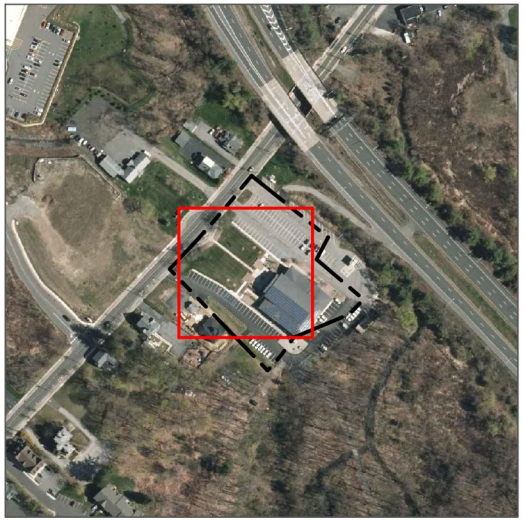
Two rain gardens can be installed northwest of the entrance of the building to capture, treat, and infiltrate stormwater runoff from the patio area. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

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"
61	67,200	3.2	33.9	308.5	0.052	1.84

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	0.095	16	6,770	0.25	920	$4,600

GREEN INFRASTRUCTURE RECOMMENDATIONS





Sparta Township Police Department

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

0 20' 40'

VETERANS OF FOREIGN WARS POST #7248

Subwatershed: Wallkill River

Site Area: 31,440 sq. ft.

Address: 66 Main Street
Sparta, NJ 07871

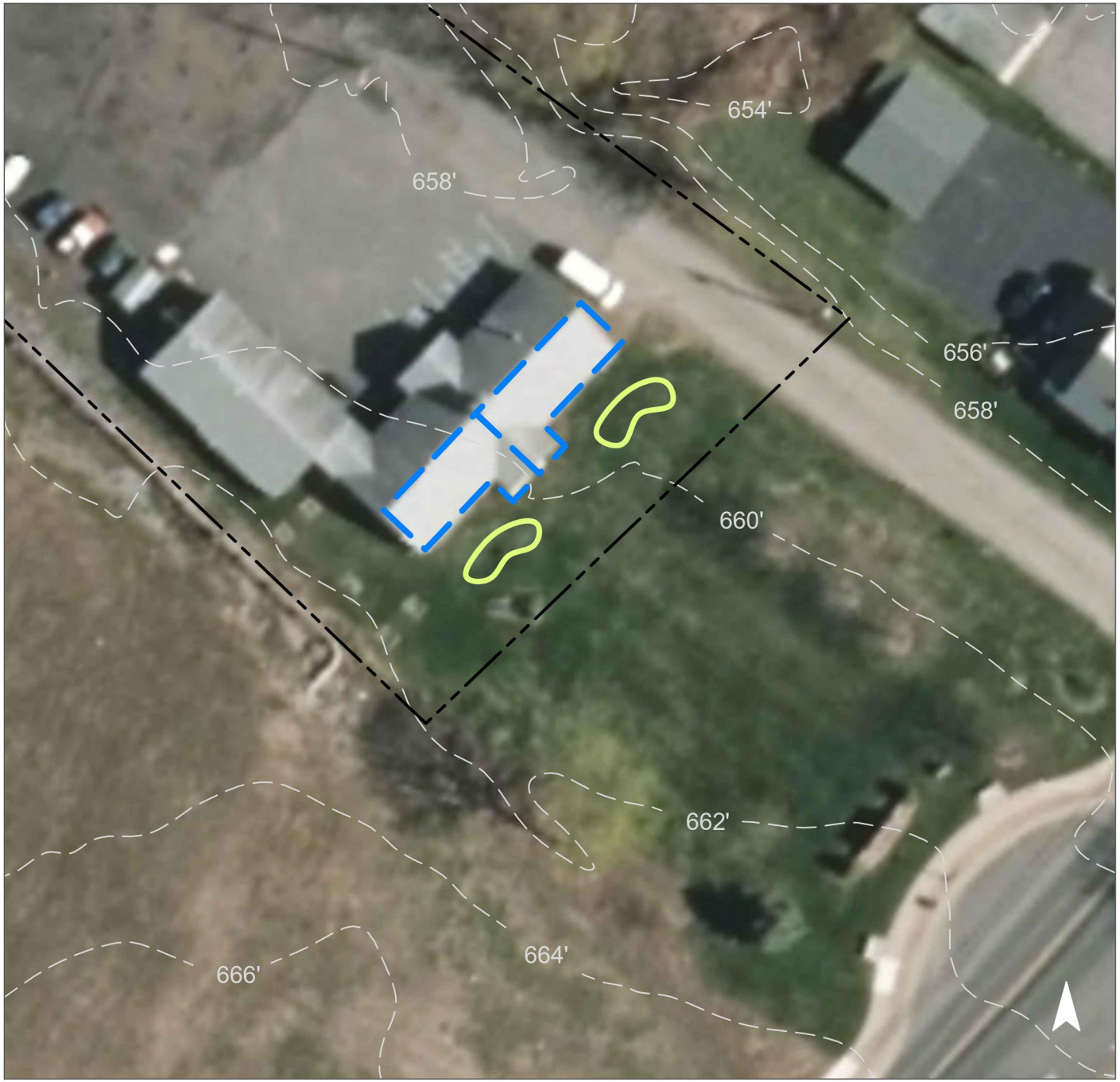
Block and Lot: Block 5202, Lot 4

Two rain gardens can be installed along the building to capture, treat, and infiltrate stormwater runoff from the roof. 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"
60	18,845	0.9	9.5	86.5	0.015	0.52

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	0.033	6	2,380	0.09	320	$1,600

GREEN INFRASTRUCTURE RECOMMENDATIONS



Veterans of Foreign Wars Post #7248

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

0 20' 40'

c. Summary of Existing Conditions

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)			Runoff Volumes from I.C.		Runoff Volumes from I.C.	
									TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)	Water Quality Storm (1.25" over 2-hours) (cu.ft.)	Annual (cu.ft.)	Water Quality Storm (1.25" over 2-hours) (Mgal)	Annual (Mgal)
	SPARTA JUNCTION TRIBUTARIES SITES	**21.26**	**925,875**				**7.71**	**335,995**	**16.2**	**169.7**	**1542.7**	**34,999**	**1,231,982**	**0.262**	**9.22**
1	**Sparta Evangelical Free Church**														
	Total Site Info	16.12	702,345	17001	3	34.6966	5.59	243,690	11.7	123.1	1118.9	25,384	893,530	0.190	6.68
2	**Sparta United Methodist Church**														
	Total Site Info	5.13	223,530	10002	1*	41.2942	2.12	92,305	4.4	46.6	423.8	9,615	338,452	0.072	2.53
	WALLKILL RIVER SUBWATERSHED SITES	**20.44**	**890,495**				**9.69**	**422,025**	**20.3**	**213.1**	**1937.7**	**43,961**	**1,547,425**	**0.329**	**11.57**
3	**First Presbyterian Church of Sparta**														
	Total Site Info	4.93	214,825	5019	7	50.5248	2.49	108,540	5.2	54.8	498.3	11,306	397,980	0.085	2.98
4	**Mohawk Avenue School**														
	Total Site Info	6.95	302,810	5016	57	38.3293	2.66	116,065	5.6	58.6	532.9	12,090	425,572	0.090	3.18
5	**Shepherd of the Hills Lutheran Church**														
	Total Site Info	4.56	198,580	2013	10	45.3747	2.07	90,105	4.3	45.5	413.7	9,386	330,385	0.070	2.47
6	**Sparta Public Library**														
	Total Site Info	0.74	32,185	5016	55	66.0867	0.49	21,270	1.0	10.7	97.7	2,216	77,990	0.017	0.58
7	**Sparta Township Police Department**														
	Total Site Info	2.54	110,655	2001	50	60.7293	1.54	67,200	3.2	33.9	308.5	7,000	246,400	0.052	1.84
8	**Veterans of Foreign Wars Post #7248**														
	Total Site Info	0.72	31,440	5020	4	59.9396	0.43	18,845	0.9	9.5	86.5	1,963	69,098	0.015	0.52

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 %
	SPARTA JUNCTION TRIBUTARIES SITES	**24,740**	**0.57**	**0.645**	**108**	**45,760**	**1.72**				**$97,925**	**7%**
1	**Sparta Evangelical Free Church**											
	Bioretention systems	6,330	0.15	0.165	28	11,710	0.44	1,585	5	SF	$7,925	3%
	Pervious pavement	12,570	0.29	0.328	55	23,250	0.87	2,400	25	SF	$60,000	5%
	Total Site Info	**18,900**	**0.43**	**0.492**	**82**	**34,960**	**1.31**				**$67,925**	**8%**
2	**Sparta United Methodist Church**											
	Pervious pavement	5,840	0.13	0.152	25	10,800	0.41	1,200	25	SF	$30,000	6%
	Total Site Info	**5,840**	**0.13**	**0.152**	**25**	**10,800**	**0.41**				**$30,000**	**6%**
	WALLKILL RIVER SUBWATERSHED SITES	**21,985**	**0.50**	**0.573**	**96**	**40,670**	**1.52**				**$55,200**	**5%**
3	**First Presbyterian Church of Sparta**											
	Bioretention system	1,460	0.03	0.038	6	2,700	0.10	365	5	SF	$1,825	1%
	Pervious pavement	5,820	0.13	0.152	25	10,760	0.40	1,400	25	SF	$35,000	5%
	Total Site Info	**7,280**	**0.17**	**0.190**	**32**	**13,460**	**0.50**				**$36,825**	**7%**
4	**Mohawk Avenue School**											
	Bioretention system	5,750	0.13	0.150	25	10,640	0.40	1,440	5	SF	$7,200	5%
	Total Site Info	**5,750**	**0.13**	**0.150**	**25**	**10,640**	**0.40**				**$7,200**	**5%**
5	**Shepherd of the Hills Lutheran Church**											
	Bioretention systems	2,550	0.06	0.066	11	4,720	0.18	630	5	SF	$3,150	3%
	Total Site Info	**2,550**	**0.06**	**0.066**	**11**	**4,720**	**0.18**				**$3,150**	**3%**
6	**Sparta Public Library**											
	Bioretention system	1,460	0.03	0.038	6	2,700	0.10	365	5	SF	$1,825	7%
	Total Site Info	**1,460**	**0.03**	**0.038**	**6**	**2,700**	**0.10**				**$1,825**	**7%**
7	**Sparta Township Police Department**											
	Bioretention systems	3,660	0.08	0.095	16	6,770	0.25	920	5	SF	$4,600	5%
	Total Site Info	**3,660**	**0.08**	**0.095**	**16**	**6,770**	**0.25**				**$4,600**	**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 %
8	**Veterans of Foreign Wars Post #7248**											
	Bioretention systems	1,285	0.03	0.033	6	2,380	0.09	320	5	SF	$1,600	7%
	Total Site Info	**1,285**	**0.03**	**0.033**	**6**	**2,380**	**0.09**				**$1,600**	**7%**