Impervious Cover Reduction Action Plan
for
Pohatcong Township, Warren County, New Jersey

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

November 3, 2016

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Introduction

Located in Warren County in northern New Jersey, Phillipsburg covers approximately 3.3 square miles. Figures 1 and 2 illustrate that Pohatcong Township is dominated by agricultural land uses. A total of 15.7% of the municipality's land use is classified as urban. Of the urban land in Pohatcong Township, rural residential is the dominant land use (Figure 3).

The New Jersey Department of Environmental Protection's (NJDEP) 2007 land use/land cover geographical information system (GIS) data layer categorizes Pohatcong 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 Pohatcong Township. Based upon the 2007 NJDEP land use/land cover data, approximately 4.5% of Pohatcong Township has impervious cover. This level of impervious cover suggests that the streams in Pohatcong Township are likely sensitive streams. [1]

Methodology

Pohatcong Township 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

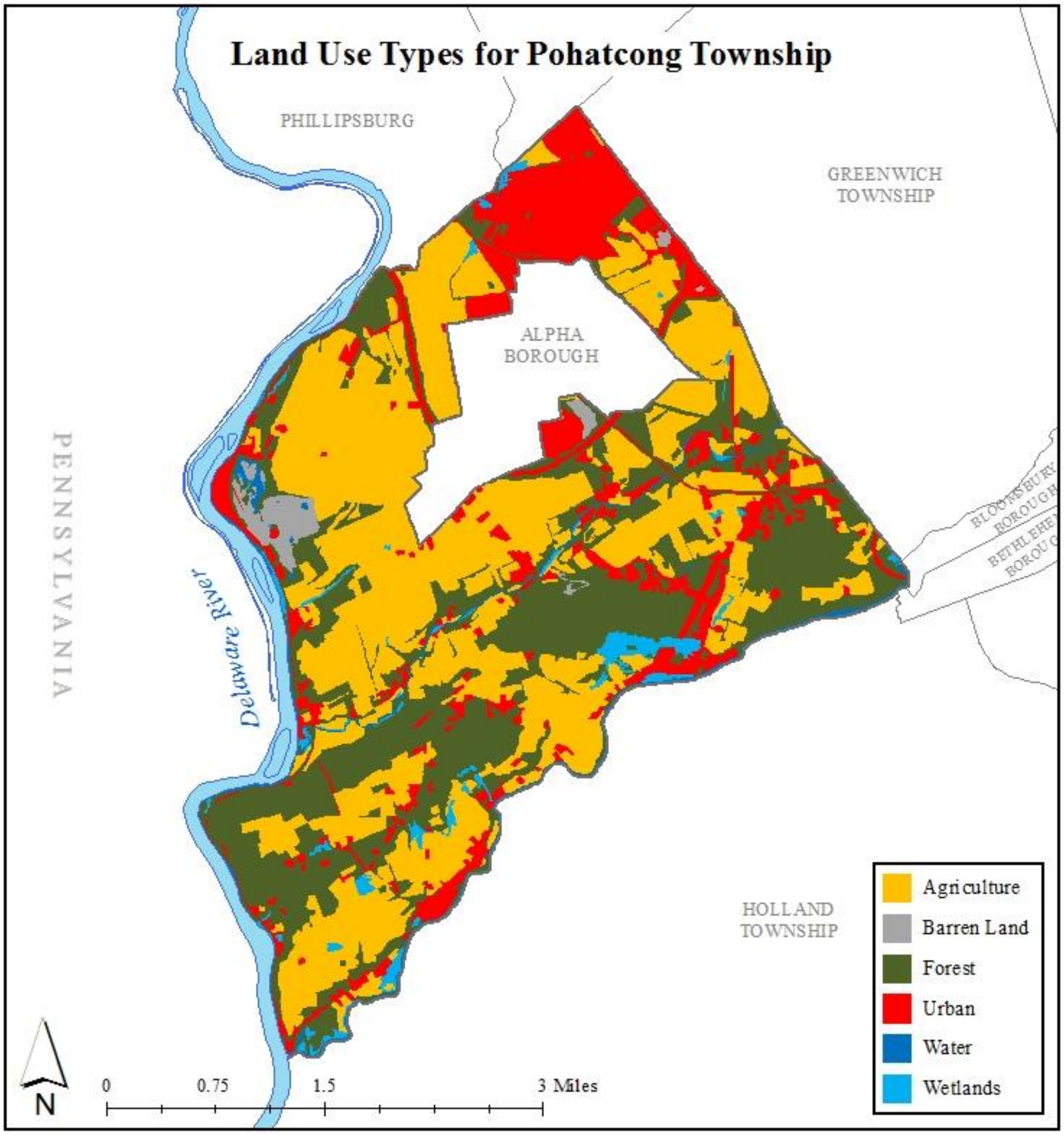


Figure 1: Map of the land use in Pohatcong Township

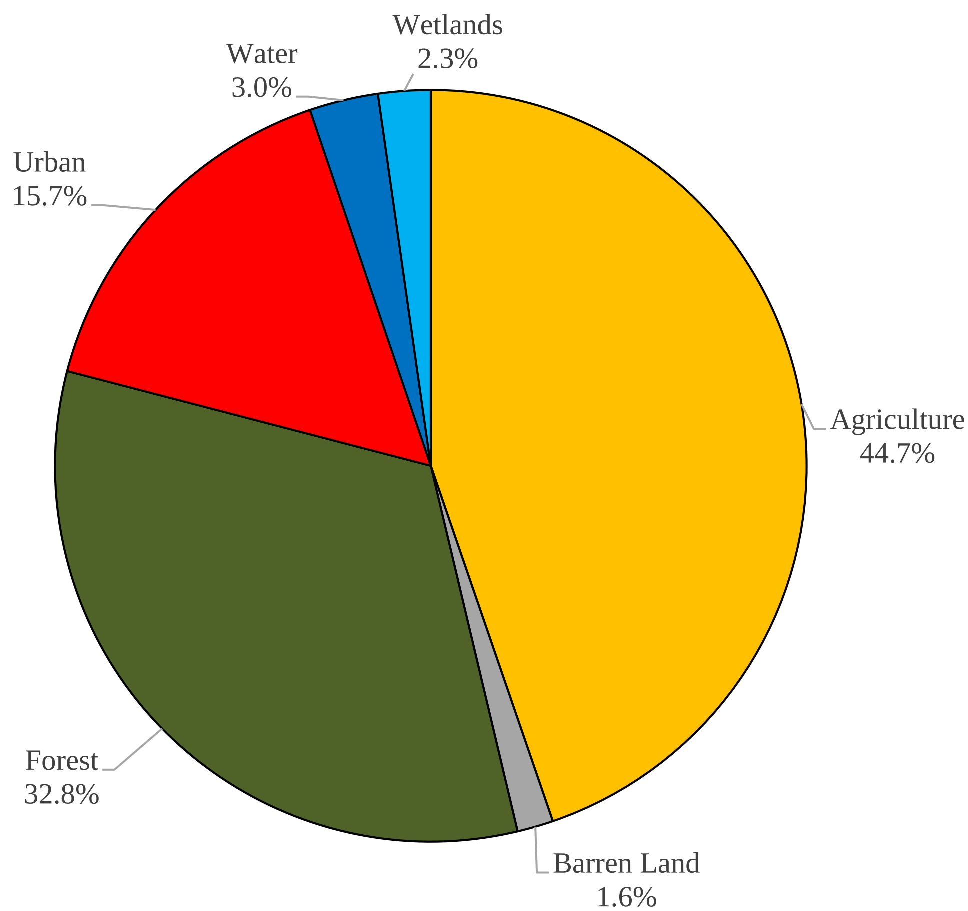


Figure 2: Pie chart illustrating the land use in Pohatcong Township

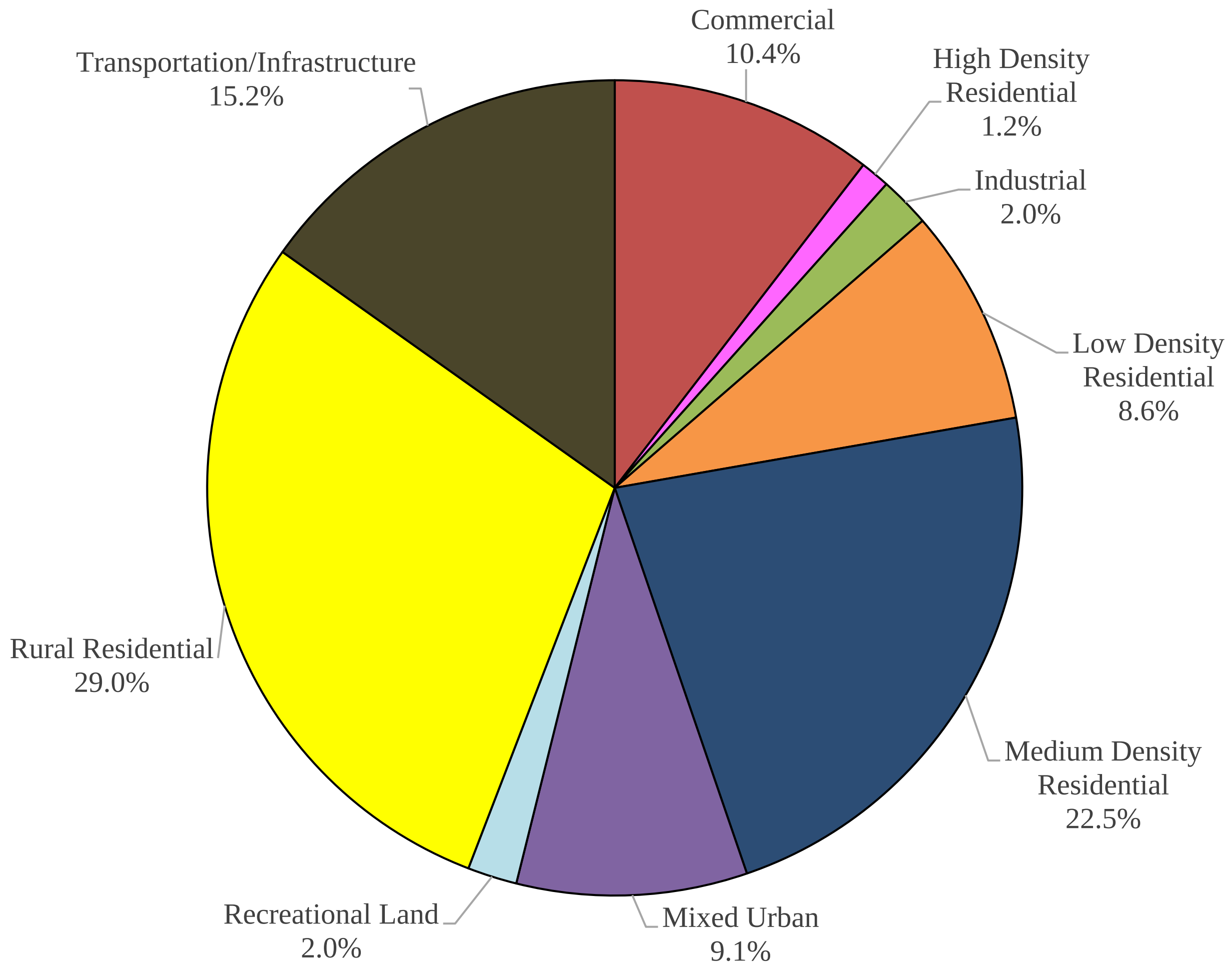


Figure 3: Pie chart illustrating the various types of urban land use in Pohatcong Township

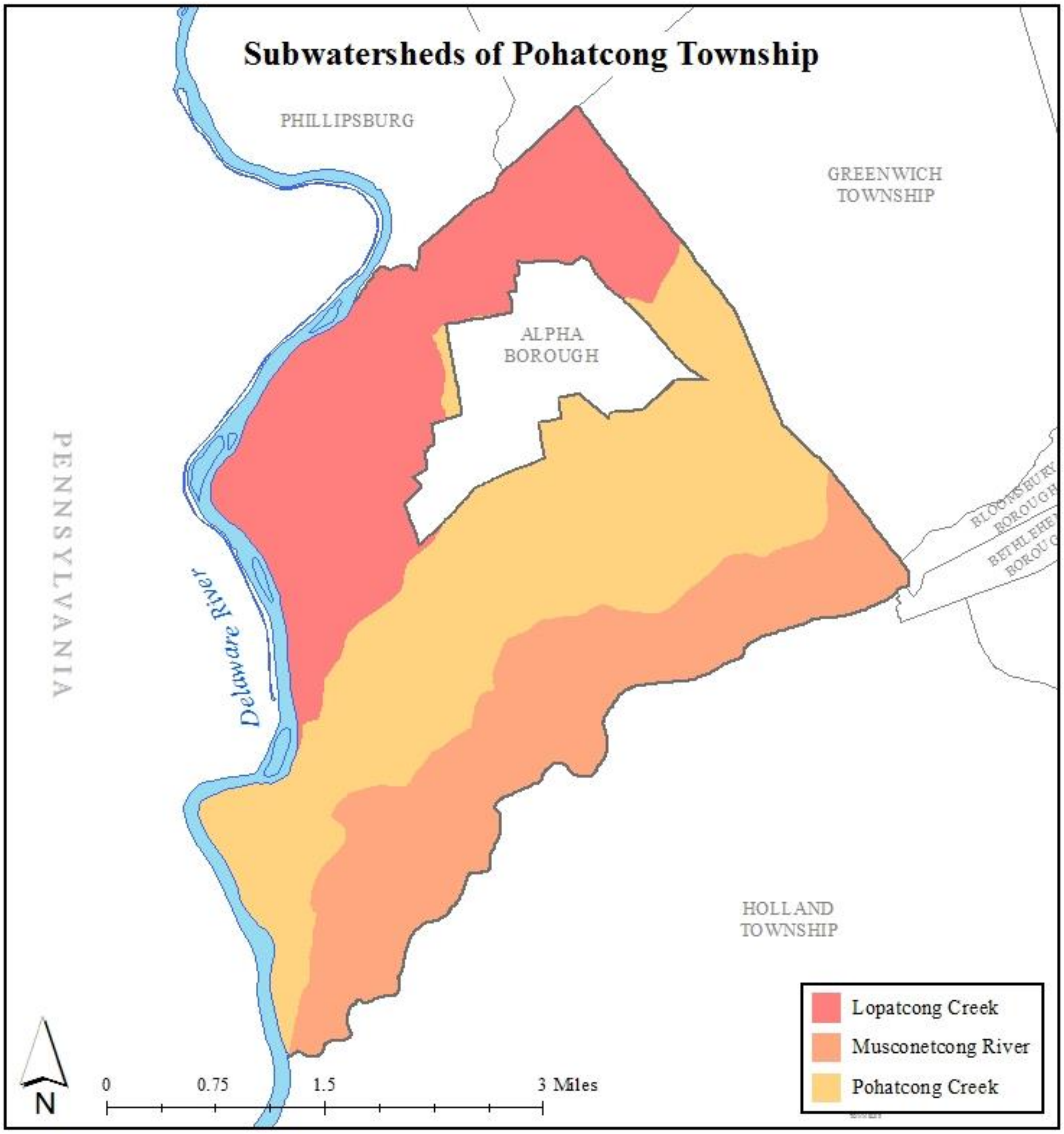


Figure 4: Map of the subwatersheds in Pohatcong Township

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

Preliminary soil assessments were conducted for each potential project site identified in Pohatcong 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 Pohatcong 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*.

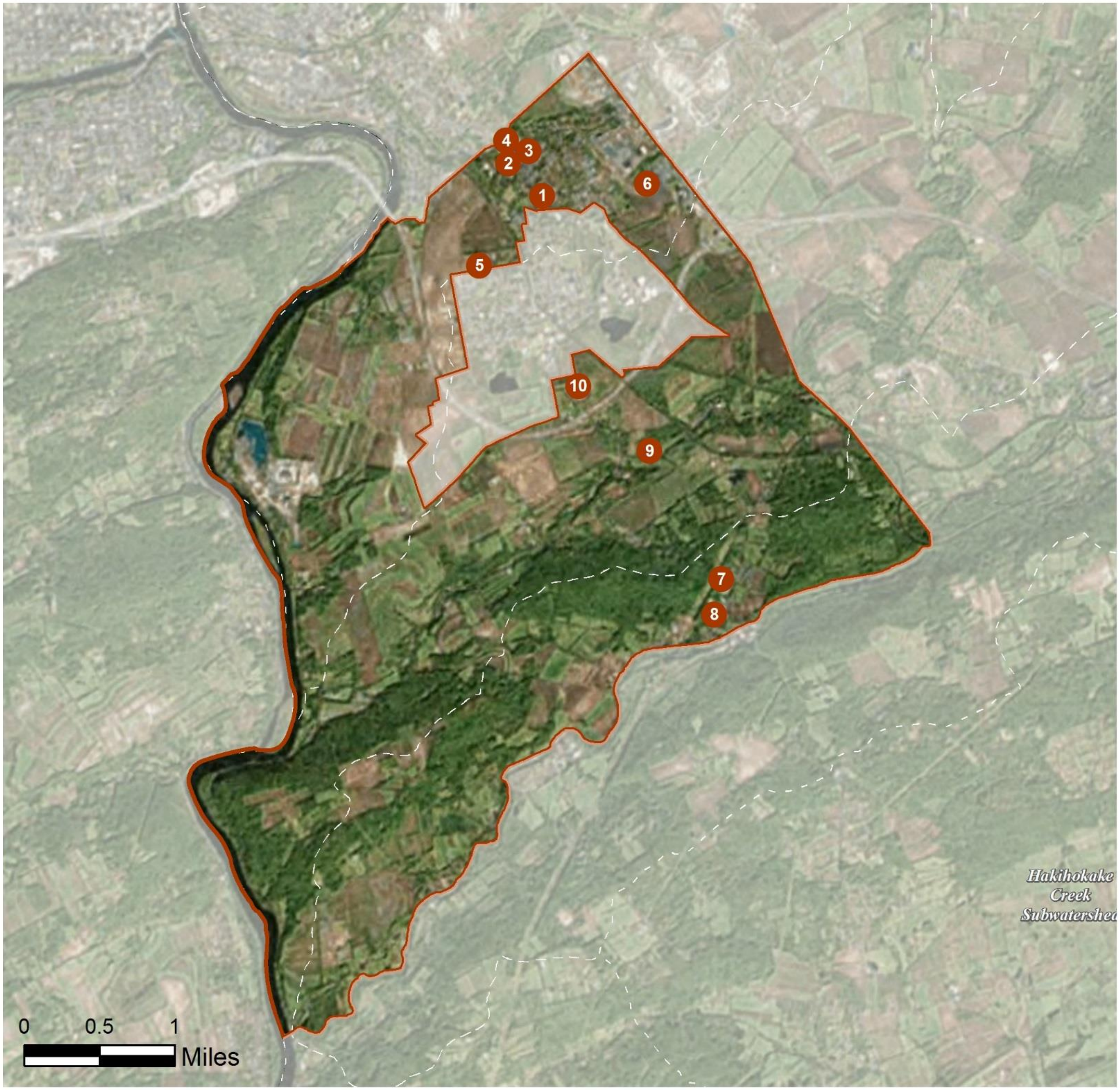
Conclusion

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

POHATCONG TOWNSHIP: GREEN INFRASTRUCTURE SITES



SITES WITHIN THE LOPATCONG CREEK SUBWATERSHED:

1. Advanced Rehabilitation
2. Francesco's Italian Restaurant
3. Hunt Avenue-Chestnut Street Streetscape
4. Huntington Volunteer Fire Department
5. United Presbyterian Church
6. Walmart Supercenter

SITES WITHIN THE MUSCONETCONG RIVER SUBWATERSHED:

7. Stepping Stone School
8. Vangeli Park

SITES WITHIN THE POHATCONG CREEK SUBWATERSHED:

9. Pohatcong Police Department
10. Pohatcong Township Elementary School

b. Proposed Green Infrastructure Concepts

ADVANCED REHABILITATION

Subwatershed: Lopatcong Creek

Site Area: 23,362 sq. ft.

Address: 538 New Brunswick Avenue
Phillipsburg, NJ 08865

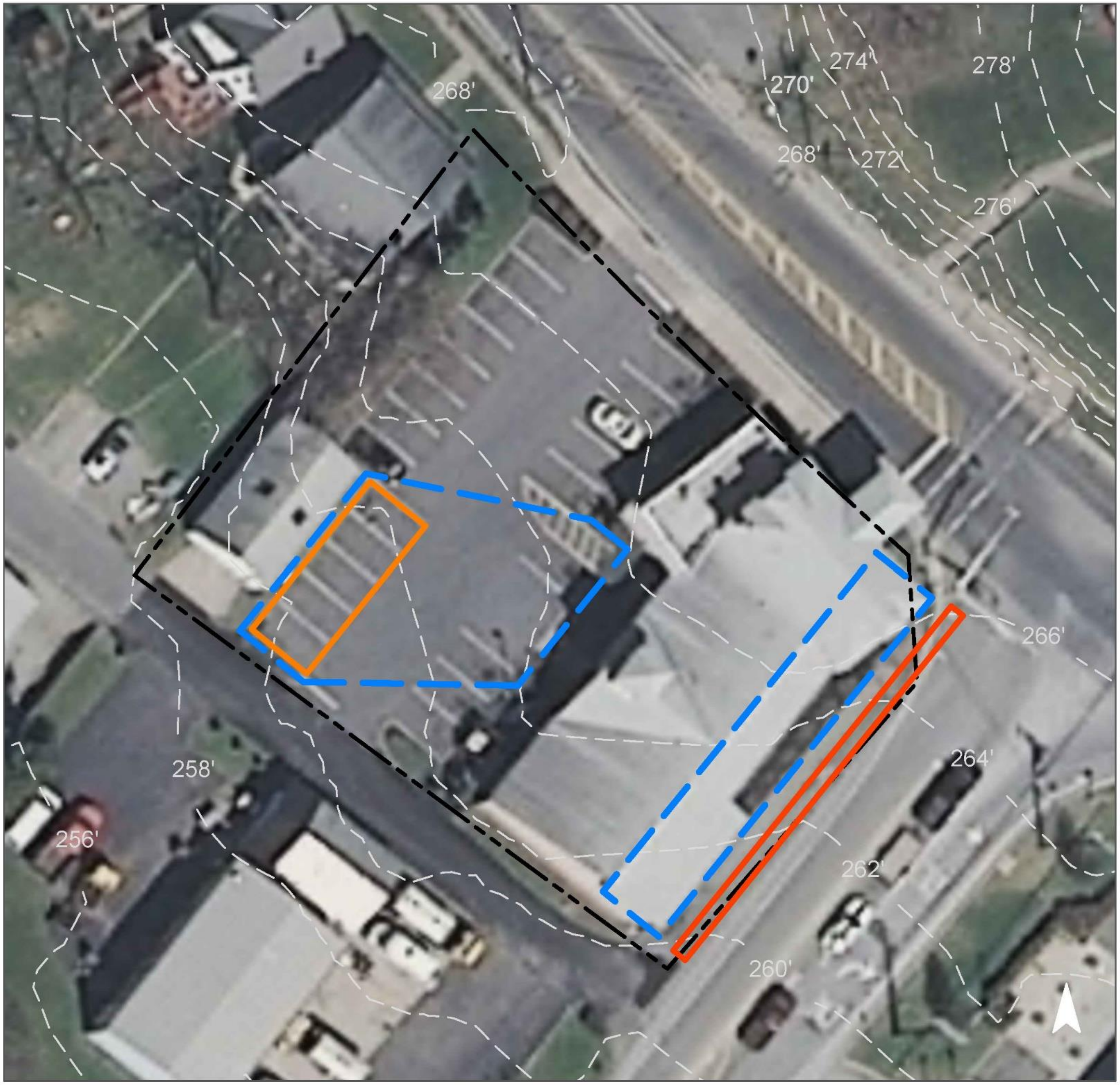
Block and Lot: Block 41.01, Lot 9

Parking spots to the northwest lot of the building can be replaced with porous asphalt to capture and infiltrate stormwater. Stormwater planters along the southeast side can capture and treat roadway runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
65	15,123	0.7	7.6	69.4	0.012	0.41

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
Pervious pavement	0.098	16	7,211	0.27	1,055	$26,375
Stormwater planters	0.060	9	4,114	0.15	460	$46,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Advanced Rehabilitation

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

0 20' 40'

FRANCESCO'S ITALIAN RESTAURANT

Subwatershed: Lopatcong Creek

Site Area: 16,756 sq. ft.

Address: 1402 South Main Street
Phillipsburg, NJ 08865

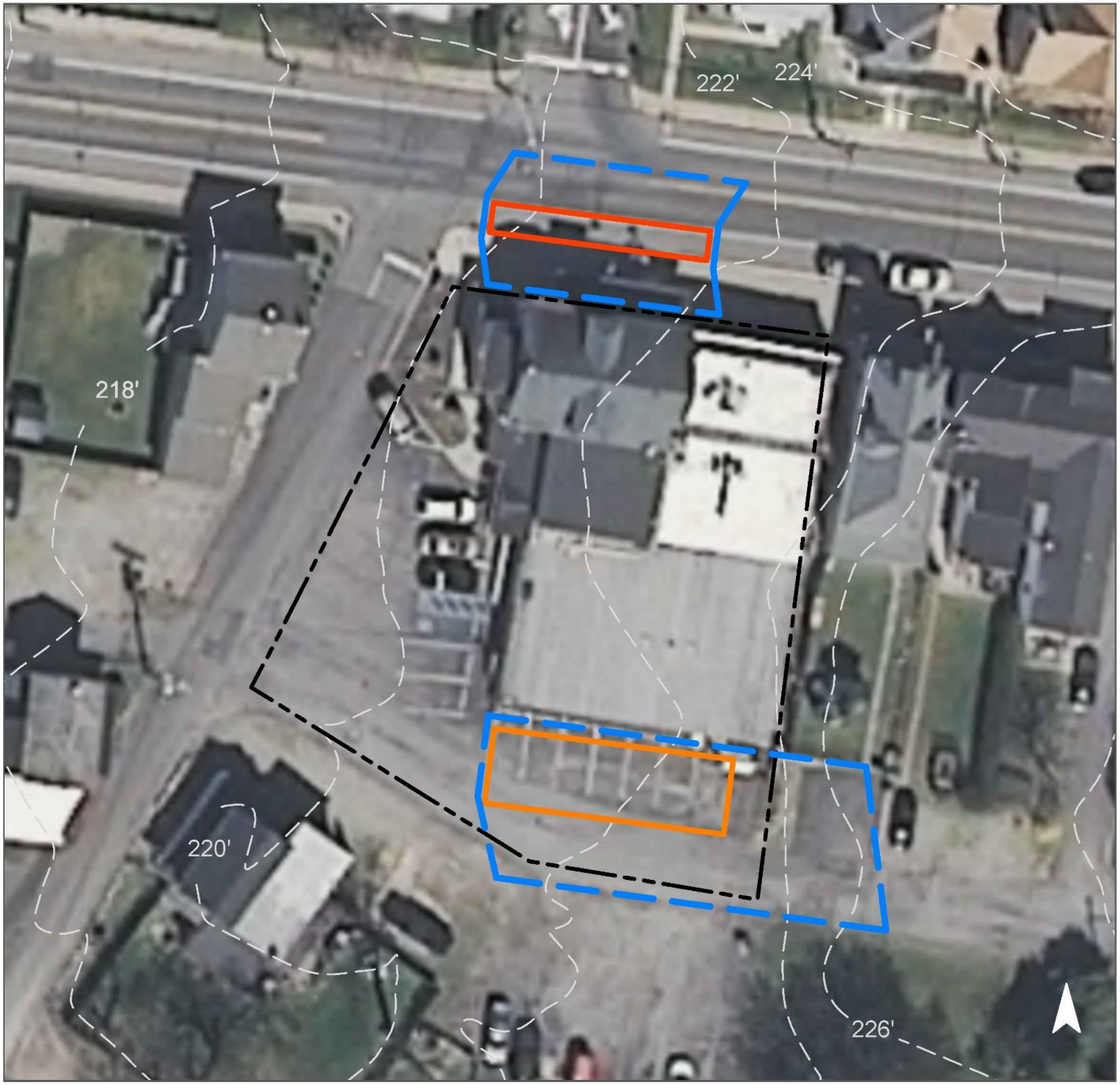
Block and Lot: Block 39.01, Lot 15

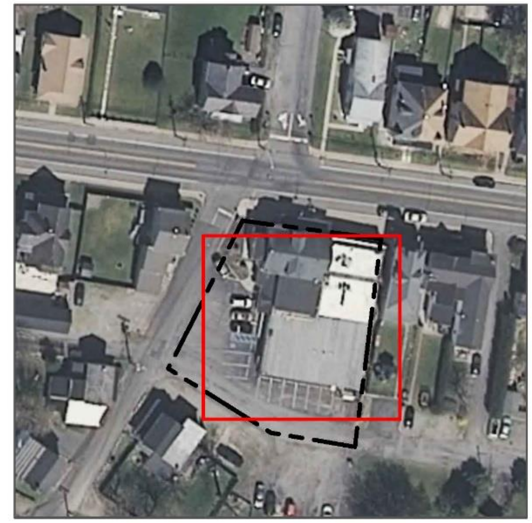
Parking spots to the south of the building can be replaced with porous asphalt to capture and infiltrate stormwater. A stormwater planter can be built into the sidewalk in front of the building to intercept stormwater runoff from the roadway and sidewalk. A preliminary soil assessment suggests that more 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"
74	12,451	0.6	6.3	57.2	0.010	0.34

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	0.113	19	8,258	0.31	1,250	$31,250
Stormwater planters	0.056	9	7,869	0.30	440	$44,000

GREEN INFRASTRUCTURE RECOMMENDATIONS





Francesco's Italian Restaurant

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

HUNT AVENUE-CHESTNUT STREET STREETSCAPE

Subwatershed: Lopatcong Creek

Site Area: 13,989 sq. ft.

Address: Hunt Avenue - Chestnut Street, Phillipsburg, NJ 08865

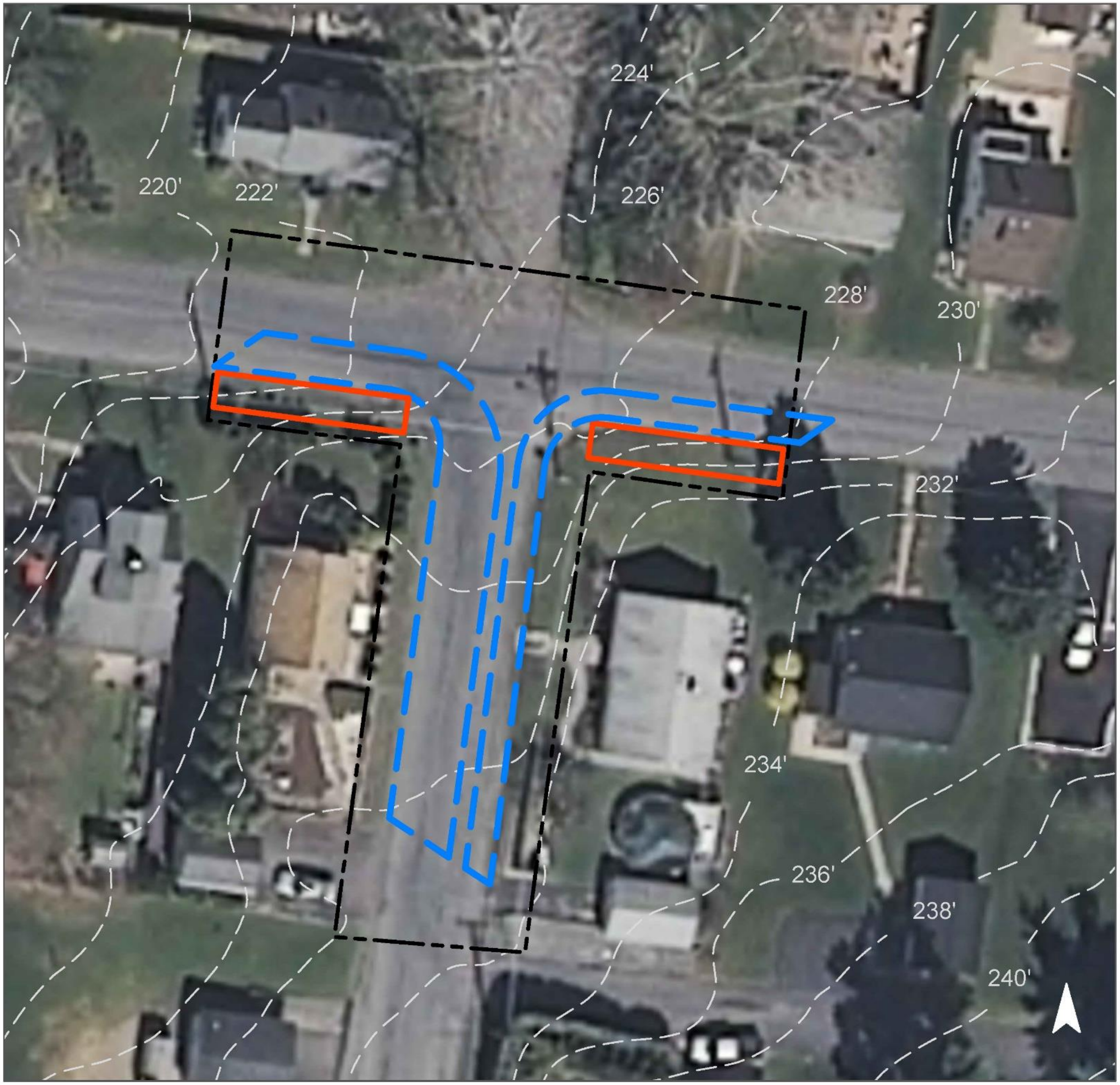
Block and Lot: n/a

Stormwater planters can be built along Chestnut Street near the drainage pipe openings to intercept stormwater runoff from the roadway. 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"
35	4,896	0.2	2.5	22.5	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
Stormwater planters	0.100	17	7,360	0.28	920	$92,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Hunt Avenue-Chestnut Street Streetscape

stormwater planter

drainage area

project line

2015 Aerial: NJOIT, OGIS

0 20' 40'

HUNTINGTON VOLUNTEER FIRE DEPARTMENT

Subwatershed: Lopatcong Creek

Site Area: 33,622 sq. ft.

Address: 1 Maple Avenue
Phillipsburg, NJ 08865

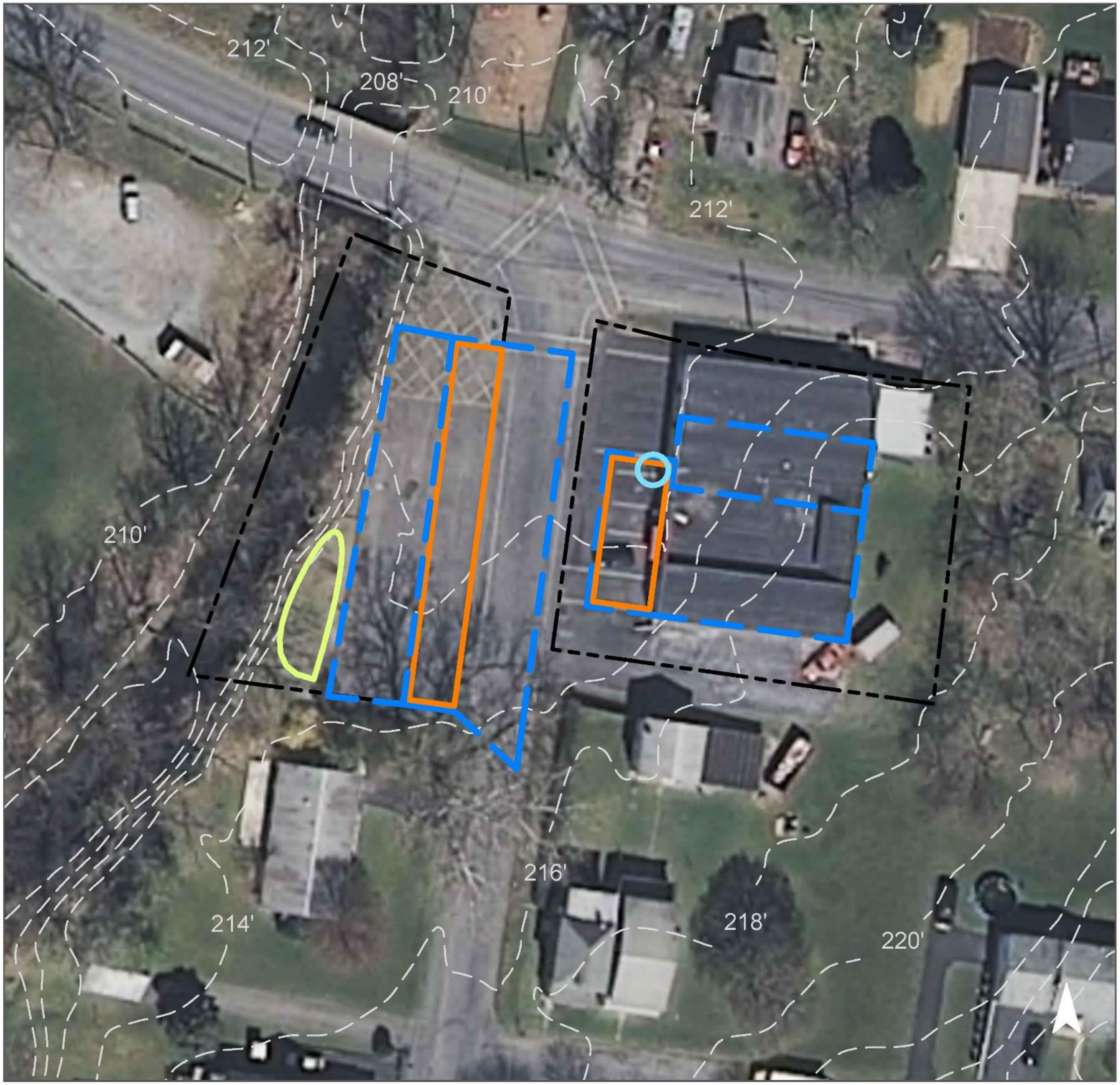
Block and Lot: Block 35.01, Lot 1

Parking spots in front of the building and across the street can be replaced with porous asphalt to capture and infiltrate stormwater from the road and rooftops. A rain garden on the western side of the lot can be used as overflow to capture rainwater before it reaches the stream. Rainwater can also be collected from the rooftop in a cistern and be used for washing vehicles. 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"
68	22,893	1.1	11.6	105.1	0.018	0.63

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	0.099	17	7,263	0.27	820	$4,100
Pervious pavement	0.329	55	24,168	0.91	3,830	$95,750
Rainwater harvesting	0.055	9	2,000	0.15	2,000 (gal)	$4,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Huntington Volunteer Fire Department

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

0 30' 60'

UNITED PRESBYTERIAN CHURCH

Subwatershed: Lopatcong Creek

Site Area: 172,276 sq. ft.

Address: 877 High Street
Phillipsburg, NJ 08865

Block and Lot: Block 93, Lot 5.01

Parking spots can be replaced with porous asphalt to capture and infiltrate stormwater runoff from the parking lot. Two rain gardens adjacent to the building can capture, treat, and infiltrate roof runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
34	59,148	2.9	29.9	271.6	0.046	1.62

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
Bioretention systems	0.087	14	6,351	0.24	600	$3,000
Pervious pavement	0.730	122	53,512	2.01	6,500	$162,500

GREEN INFRASTRUCTURE RECOMMENDATIONS

United Presbyterian Church

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

0 25' 50'

WALMART SUPERCENTER

Subwatershed: Lopatcong Creek

Site Area: 1,472,224 sq. ft.

Address: 1300 US-22
Phillipsburg, NJ 08865

Block and Lot: Block 75, Lot 1.01

Bioretention systems can be installed along the northern end of the parking lot to capture, treat, and infiltrate stormwater runoff. Parking spots to the southeast of the building can be replaced with porous asphalt to capture and infiltrate stormwater. 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	971,659	46.8	490.7	4,461.2	0.757	26.65

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	1.472	246	108,041	4.06	13,200	$66,000
Pervious pavement	1.069	179	78,435	2.95	14,880	$372,000

GREEN INFRASTRUCTURE RECOMMENDATIONS

Walmart Supercenter

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

0 50' 100'

GREEN INFRASTRUCTURE RECOMMENDATIONS

Walmart Supercenter

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

0 30' 60'

STEPPING STONE SCHOOL

Subwatershed: Musconetcong River

Site Area: 290,241 sq. ft.

Address: 45 County Road 519
Bloomsbury, NJ 08804

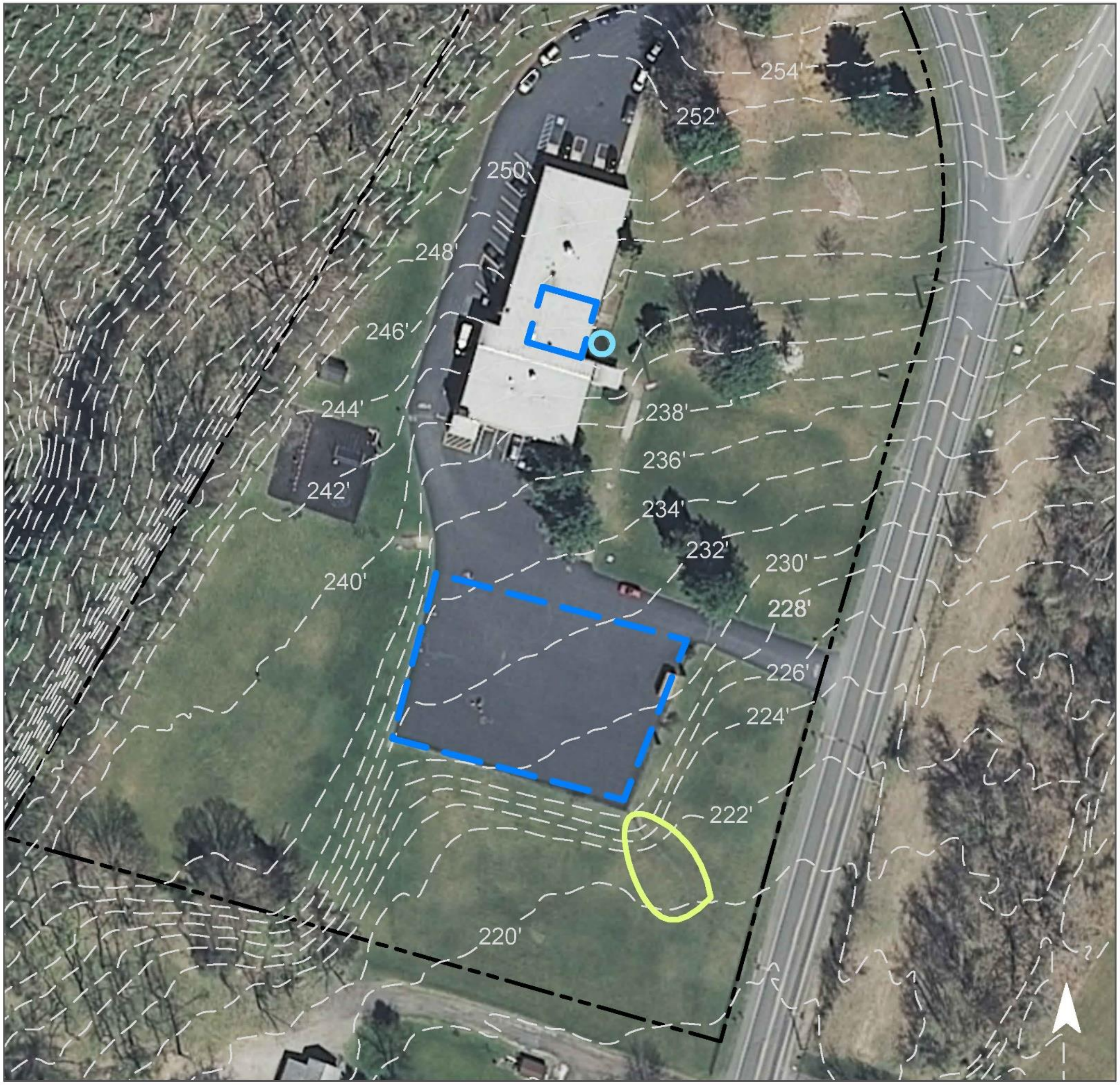
Block and Lot: Block 109, Lot 20

A bioretention system installed between the parking lot and the stormwater outlet can capture, treat, and infiltrate runoff before it reaches the catch basin. A cistern installed in the back of the school near the vegetable garden can capture roof runoff and be recycled to water the garden. 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"
29	83,727	4.0	42.3	384.4	0.065	2.30

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	0.474	79	34,812	1.31	3,890	$19,450
Rainwater harvesting	0.036	6	2,648	0.10	3,000 (gal)	$6,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Stepping Stone School

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

0 50' 100'

VANGELI PARK

Subwatershed: Musconetcong River

Site Area: 7,135,239 sq. ft.

Address: 3 County Road 519
Bloomsbury, NJ 08804

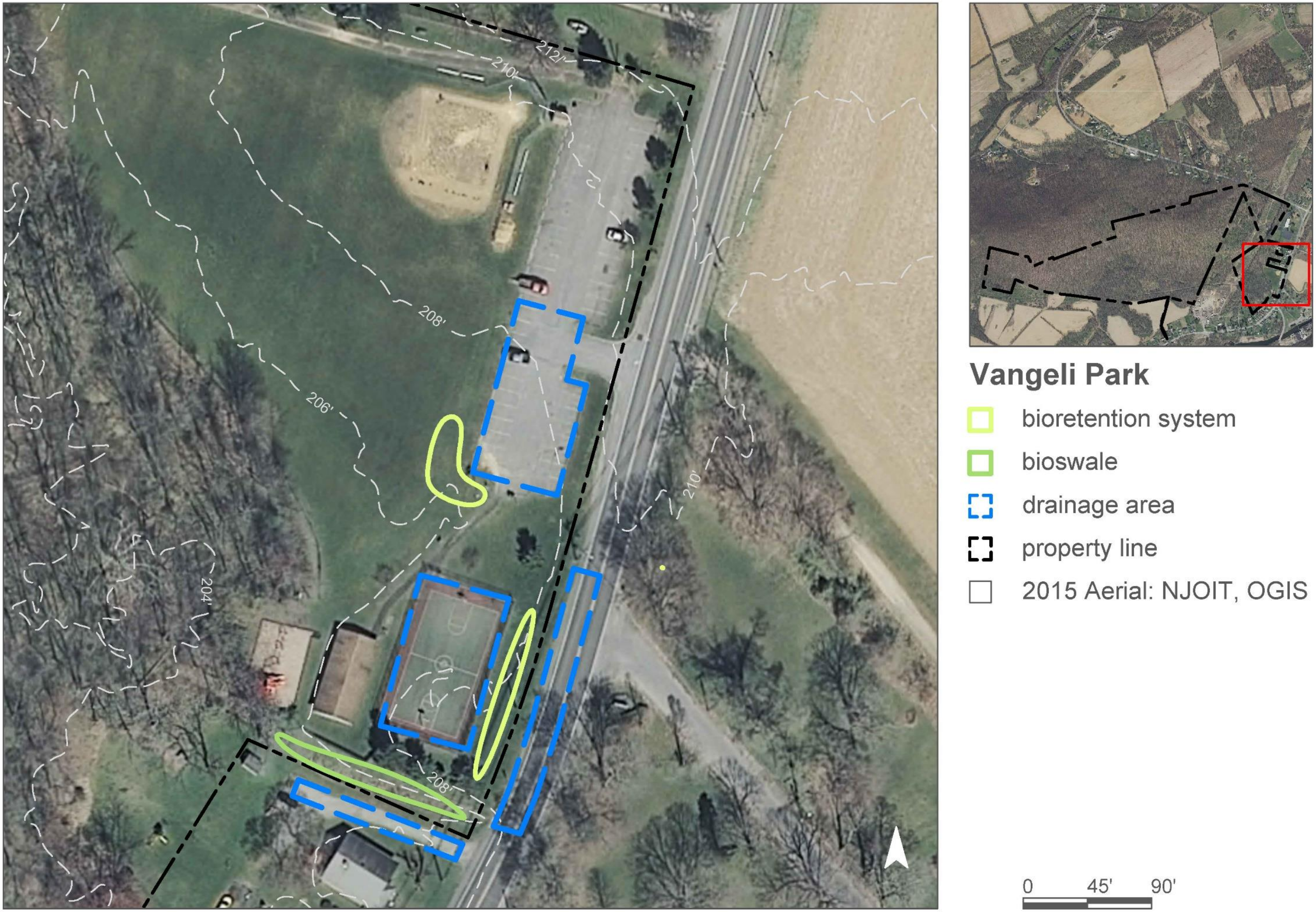
Block and Lot: Block 109, Lot 66

Rain gardens can be installed to capture, treat, and infiltrate runoff from the parking lot and roadway. A bioswale can be built in the ditch to the south of the basketball court to intercept runoff before it reaches the catch basins. 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"
1	59,401	2.9	30.0	272.7	0.046	1.63

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	0.277	46	20,301	0.76	2,500	$12,500
Bioswale	0.221	37	16,254	0.61	1,555	$7,775

GREEN INFRASTRUCTURE RECOMMENDATIONS



POHATCONG POLICE DEPARTMENT

Subwatershed: Pohatcong Creek

Site Area: 153,931 sq. ft.

Address: 50 Municipal Drive
Phillipsburg, NJ 08865

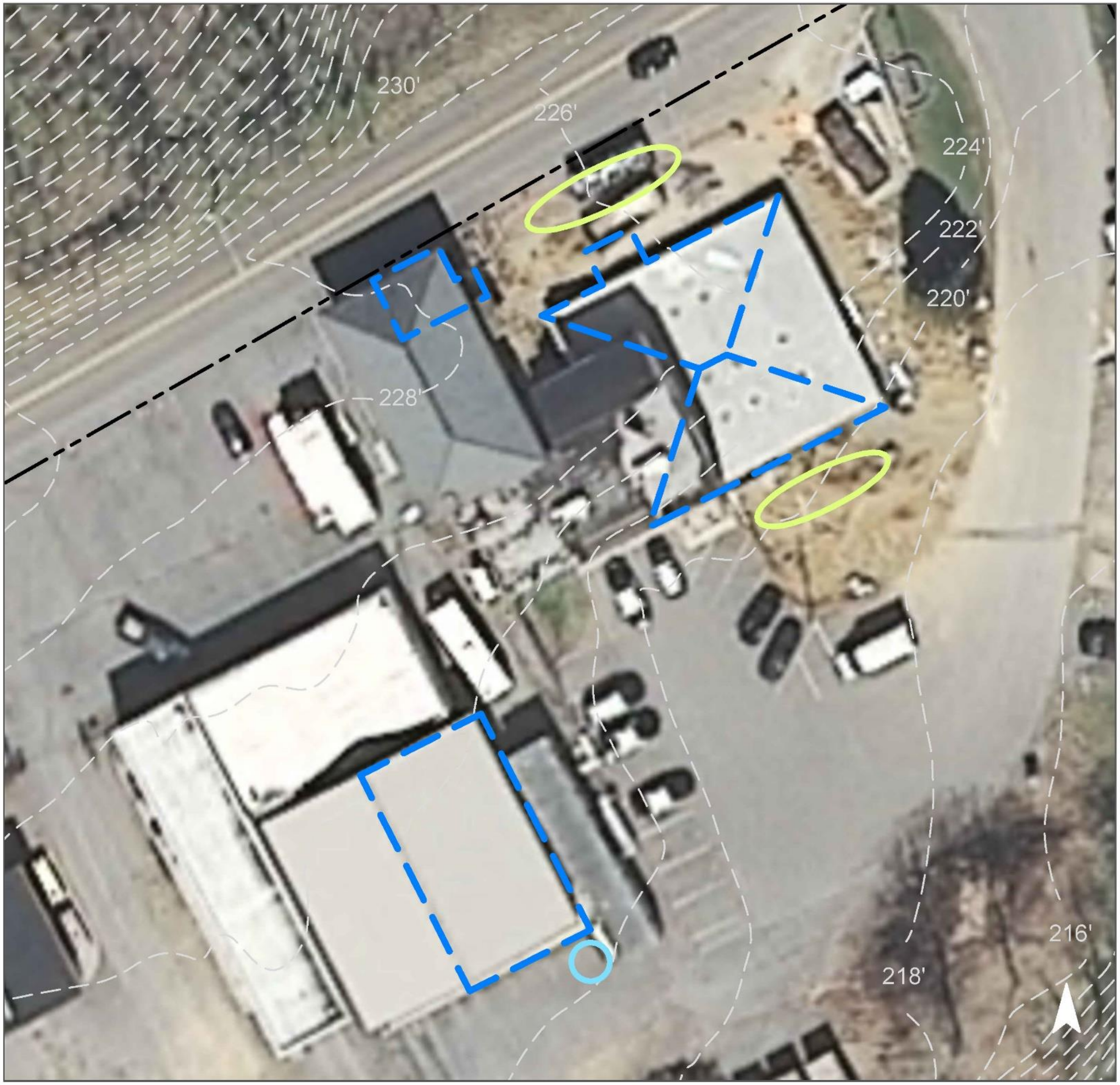
Block and Lot: Block 107, Lot 37,38,39.01

Bioretention systems can be installed to capture, treat, and infiltrate rooftop runoff. Rainwater can be harvested by installing a cistern along the building. The water can then be used for watering gardens, washing vehicles, or for other non-potable uses. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
40	61,231	3.0	30.9	281.1	0.048	1.68

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	0.076	13	5,565	0.21	720	$3,600
Rainwater harvesting	0.059	10	2,200	0.16	2,200 (gal)	$4,400

GREEN INFRASTRUCTURE RECOMMENDATIONS



Pohatcong Police Department

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

0 20' 40'

POHATCONG TOWNSHIP ELEMENTARY SCHOOL

Subwatershed: Pohatcong Creek

Site Area: 3,192,557 sq. ft.

Address: 240 County Road 519
Phillipsburg, NJ 08865

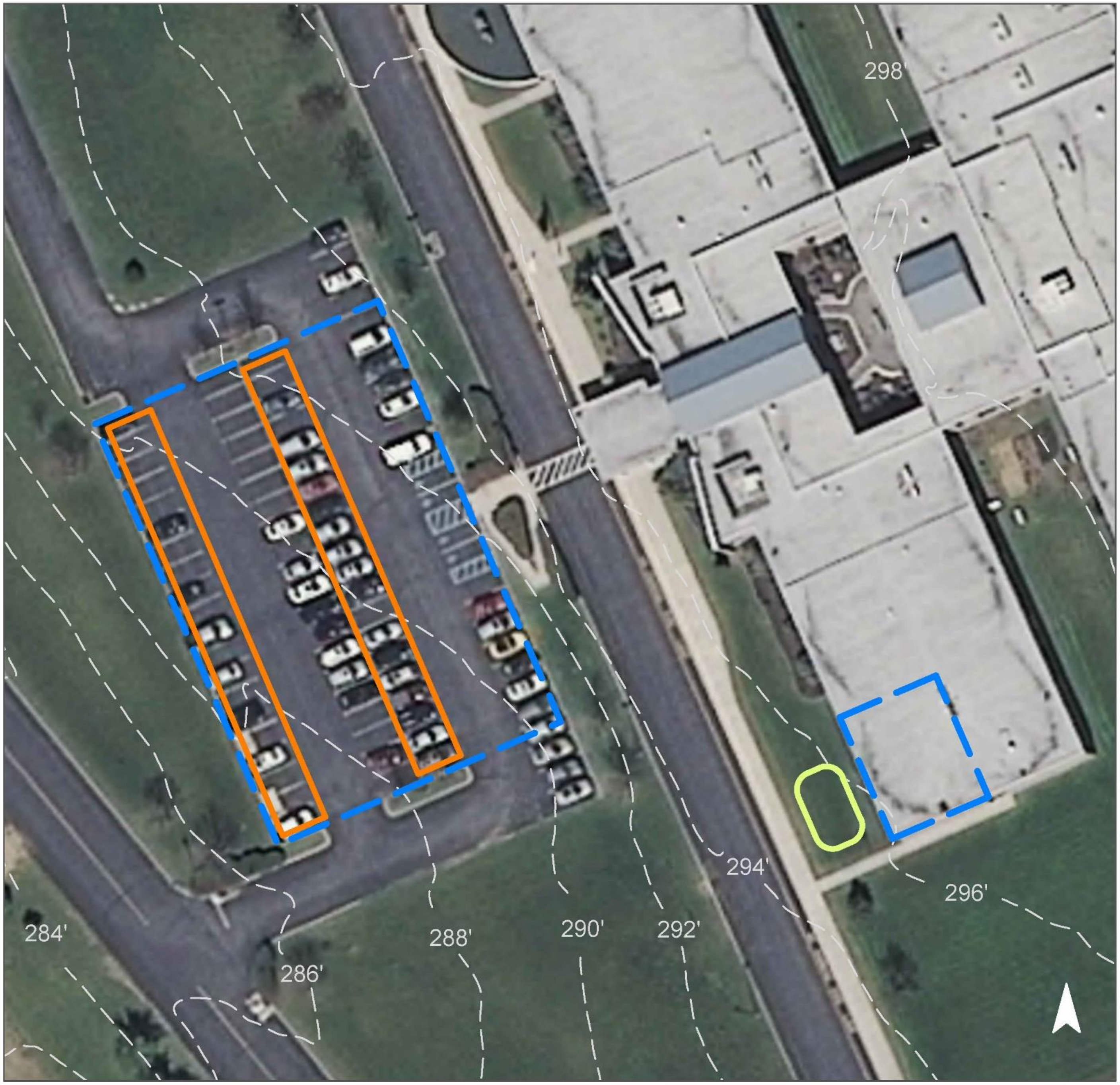
Block and Lot: Block 101, Lot 1, 1.01, 1.02, 2

Parking spots to the west of the building can be replaced with porous asphalt to capture and infiltrate stormwater. A rain garden can be installed in front of the building to capture, treat, and infiltrate rooftop runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
12	373,249	18.0	188.5	1,713.7	0.291	10.24

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention system	0.056	9	4,092	0.15	560	$2,800
Pervious pavement	0.568	95	41,671	1.57	6,520	$163,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Pohatcong Township Elementary School

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

c. Summary of Existing Conditions

Summary of Existing Site Conditions

Subwatershed/Site Name/Total Site Info/GI Practice	Area (ac)	Area (SF)	Block	Lot	Existing Annual Loads TP (lb/yr)	TN (lb/yr)	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)	Annual (Mgal)
LOPATCONG CREEK SUBWATERSHED	**39.77**	**1,732,229**			**52.4**	**548.6**	**4,987.0**		**24.94**	**1,086,170**	**0.846**	**29.79**
Advanced Rehabilitation												
Total Site Info	0.54	23,362	41.01	9	0.7	7.6	69.4	65	0.35	15,123	0.012	0.41
Francesco's Italian Restaurant												
Total Site Info	0.38	16,756	39.01	15	0.6	6.3	57.2	74	0.29	12,451	0.010	0.34
Hunt Avenue-Chestnut Street Streetscape												
Total Site Info	0.32	13,989	n/a	n/a	0.2	2.5	22.5	35	0.11	4,896	0.004	0.13
Huntington Volunteer Fire Department												
Total Site Info	0.77	33,622	35.01	1	1.1	11.6	105.1	68	0.53	22,893	0.018	0.63
United Presbyterian Church												
Total Site Info	3.95	172,276	93	5.01	2.9	29.9	271.6	34	1.36	59,148	0.046	1.62
Walmart Supercenter												
Total Site Info	33.80	1,472,224	75	1.01	46.8	490.7	4,461.2	66	22.31	971,659	0.757	26.65
MUSCONETCONG RIVER SUBWATERSHED	**170.47**	**7,425,479**			**6.9**	**72.3**	**657.2**		**3.29**	**143,128**	**0.112**	**3.93**
Stepping Stone School												
Total Site Info	6.66	290,241	109	20	4.0	42.3	384.4	29	1.92	83,727	0.065	2.30
Vangeli Park												
Total Site Info	163.80	7,135,239	109	66	2.9	30.0	272.7	1	1.36	59,401	0.046	1.63
POHATCONG CREEK SUBWATERSHED	**76.82**	**3,346,488**			**20.9**	**219.4**	**1,994.9**		**9.97**	**434,480**	**0.339**	**11.92**
Pohatcong Police Department												
Total Site Info	3.53	153,931	107	37,38,39.01	3.0	30.9	281.1	40	1.41	61,231	0.048	1.68
Pohatcong Township Elementary School												
Total Site Info	73.29	3,192,557	101	1,1.01,1.02,2	18.0	188.5	1,713.7	12	8.57	373,249	0.291	10.24

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 %
	LOPATCONG CREEK SUBWATERSHED	**163,635**	**3.76**	**4.264**	**714**	**314,604**	**11.90**	**45,955**			**$946,975**	**15.1%**
1	**Advanced Rehabilitation**											
	Pervious pavement	3,770	0.09	0.098	16	7,211	0.27	1,055	25	SF	$26,375	24.9%
	Stormwater planters	2,150	0.05	0.056	9	4,114	0.15	460	100	SF	$46,000	14.2%
	Total Site Info	**5,920**	**0.14**	**0.154**	**26**	**11,325**	**0.42**	**1,515**			**$72,375**	**39.1%**
2	**Francesco's Italian Restaurant**											
	Pervious pavement	4,320	0.10	0.113	19	8,258	0.31	1,250	25	SF	$31,250	34.7%
	Stormwater planters	2,150	0.05	0.056	9	7,869	0.30	440	100	SF	$44,000	17.3%
	Total Site Info	**6,470**	**0.15**	**0.169**	**28**	**16,127**	**0.61**	**1,690**			**$75,250**	**52.0%**
3	**Hunt Avenue-Chestnut Street Streetscape**											
	Stormwater planters	3,850	0.09	0.100	17	7,360	0.28	920	100	SF	$92,000	78.6%
	Total Site Info	**3,850**	**0.09**	**0.100**	**17**	**7,360**	**0.28**	**920**			**$92,000**	**78.6%**
4	**Huntington Volunteer Fire Department**											
	Bioretention system	3,800	0.09	0.099	17	7,263	0.27	820	5	SF	$4,100	16.6%
	Pervious pavement	12,640	0.29	0.329	55	24,168	0.91	3,830	25	SF	$95,750	55.2%
	Rainwater harvesting	2,100	0.05	0.055	9	2,000	0.15	2,000	2	gal	$4,000	9.2%
	Total Site Info	**18,540**	**0.43**	**0.483**	**81**	**33,431**	**1.33**	**6,650**			**$103,850**	**81.0%**
5	**United Presbyterian Church**											
	Bioretention systems	3,320	0.08	0.087	14	6,351	0.24	600	5	SF	$3,000	5.6%
	Pervious pavement	28,000	0.64	0.730	122	53,534	2.01	6,500	25	SF	$162,500	47.3%
	Total Site Info	**31,320**	**0.72**	**0.816**	**137**	**59,885**	**2.25**	**7,100**			**$165,500**	**53.0%**
6	**Walmart Supercenter**											
	Bioretention systems	56,510	1.30	1.472	246	108,041	4.06	13,200	5	SF	$66,000	5.8%
	Pervious pavement	41,025	0.94	1.069	179	78,435	2.95	14,880	25	SF	$372,000	4.2%
	Total Site Info	**97,535**	**2.24**	**2.541**	**425**	**186,476**	**7.01**	**28,080**			**$438,000**	**10.0%**

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 %
	MUSCONETCONG RIVER SUBWATERSHED	**38,705**	**0.89**	**1.008**	**169**	**74,015**	**2.78**	**10,945**			**$45,725**	**27.0%**
7	**Stepping Stone School**											
	Bioretention system	18,200	0.42	0.474	79	34,812	1.31	3,890	5	SF	$19,450	21.7%
	Rainwater harvesting	1,385	0.03	0.036	6	2,648	0.10	3,000	2	gal	$6,000	6.0%
	Total Site Info	**19,585**	**0.45**	**0.510**	**85**	**37,460**	**1.41**	**6,890**			**$25,450**	**27.8%**
8	**Vangeli Park**											
	Bioretention systems	10,620	0.24	0.277	46	20,301	0.76	2,500	5	SF	$12,500	17.9%
	Bioswale	8,500	0.20	0.221	37	16,254	0.61	1,555	5	SF	$7,775	14.3%
	Total Site Info	**19,120**	**0.44**	**0.498**	**83**	**36,555**	**1.37**	**4,055**			**$20,275**	**32.2%**
	POHATCONG CREEK SUBWATERSHED	**29,100**	**0.67**	**0.758**	**127**	**53,528**	**2.09**	**10,000**			**$173,800**	**18.9%**
9	**Pohatcong Police Department**											
	Bioretention systems	2,910	0.07	0.076	13	5,565	0.21	720	5	SF	$3,600	4.8%
	Rainwater harvesting	2,250	0.05	0.059	10	2,200	0.16	2,200	2	gal	$4,400	3.7%
	Total Site Info	**5,160**	**0.12**	**0.134**	**23**	**7,765**	**0.37**	**2,920**			**$8,000**	**8.4%**
10	**Pohatcong Township Elementary School**											
	Bioretention system	2,140	0.05	0.056	9	4,092	0.15	560	5	SF	$2,800	0.6%
	Pervious pavement	21,800	0.50	0.568	95	41,671	1.57	6,520	25	SF	$163,000	5.8%
	Total Site Info	**23,940**	**0.55**	**0.624**	**104**	**45,763**	**1.72**	**7,080**			**$165,800**	**6.4%**