



**Draft**

**Impervious Cover Reduction Action Plan  
for  
Upper Deerfield Township, Cumberland County, New Jersey**

*Prepared for Upper Deerfield Township by the  
Rutgers Cooperative Extension Water Resources Program*

February 10, 2016



## Table of Contents

Introduction .....	1
Methodology .....	1
Green Infrastructure Practices .....	8
Potential Project Sites .....	10
Conclusion .....	11

### Attachment: Climate Resilient Green Infrastructure

- a. Green Infrastructure Sites
- b. Proposed Green Infrastructure Concepts
- c. Summary of Existing Conditions
- d. Summary of Proposed Green Infrastructure Practices

## **Introduction**

Located in Cumberland County in southern New Jersey, Upper Deerfield Township is approximately 31.2 square miles in size. Figures 1 and 2 illustrate that Upper Deerfield Township is dominated by agriculture land use. A total of 17.3% of the municipality's land use is classified as urban. Of the urban land use in Upper Deerfield 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 Upper Deerfield 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 Upper Deerfield Township. Based upon the 2007 NJDEP land use/land cover data, approximately 5.4% of Upper Deerfield Township has impervious cover. This level of impervious cover suggests that the streams in Upper Deerfield Township are likely sensitive streams.<sup>1</sup>

## **Methodology**

Upper Deerfield Township contains portions of six 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.

---

<sup>1</sup> 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

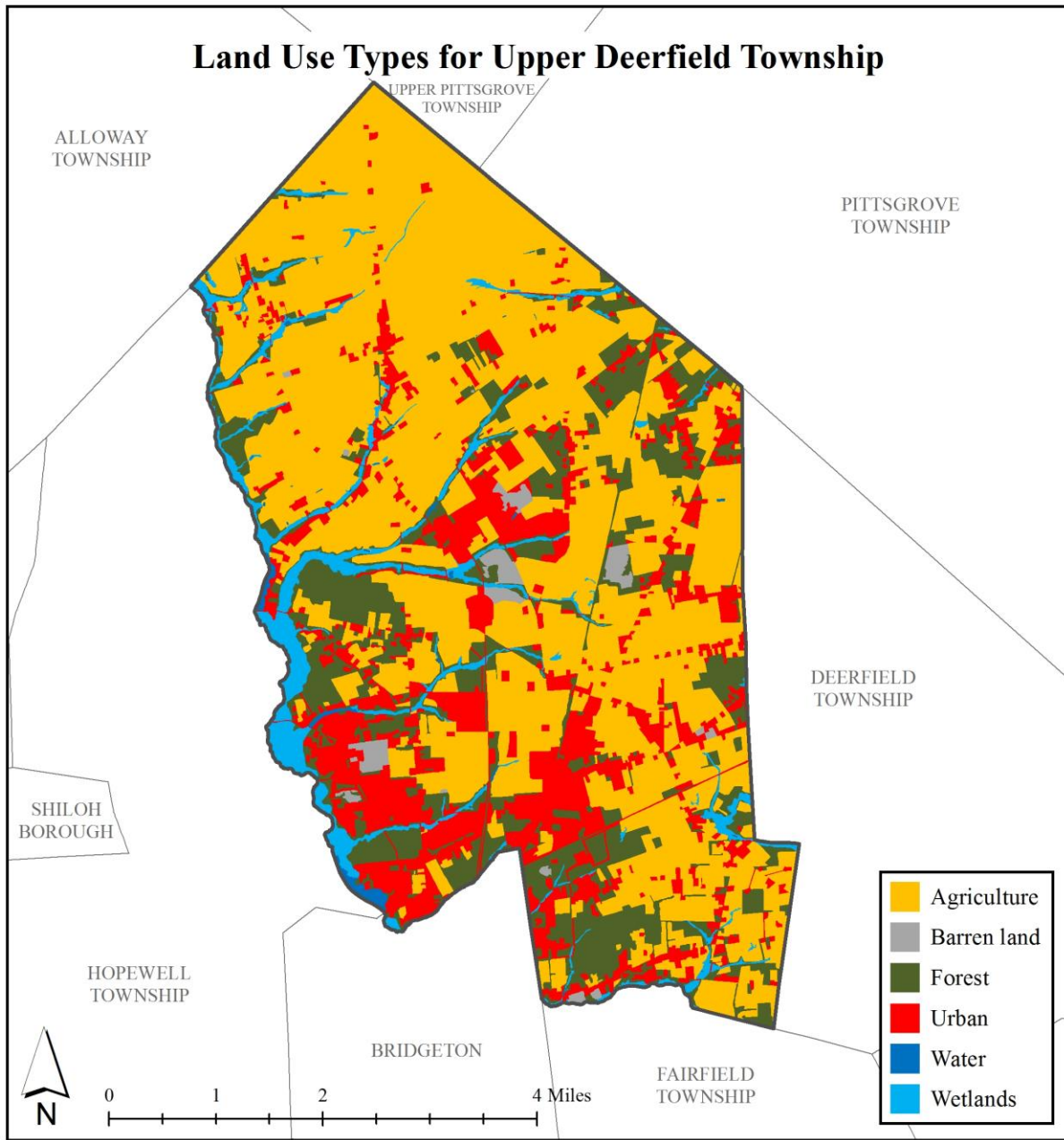


Figure 4: Map illustrating the land use in Upper Deerfield Township



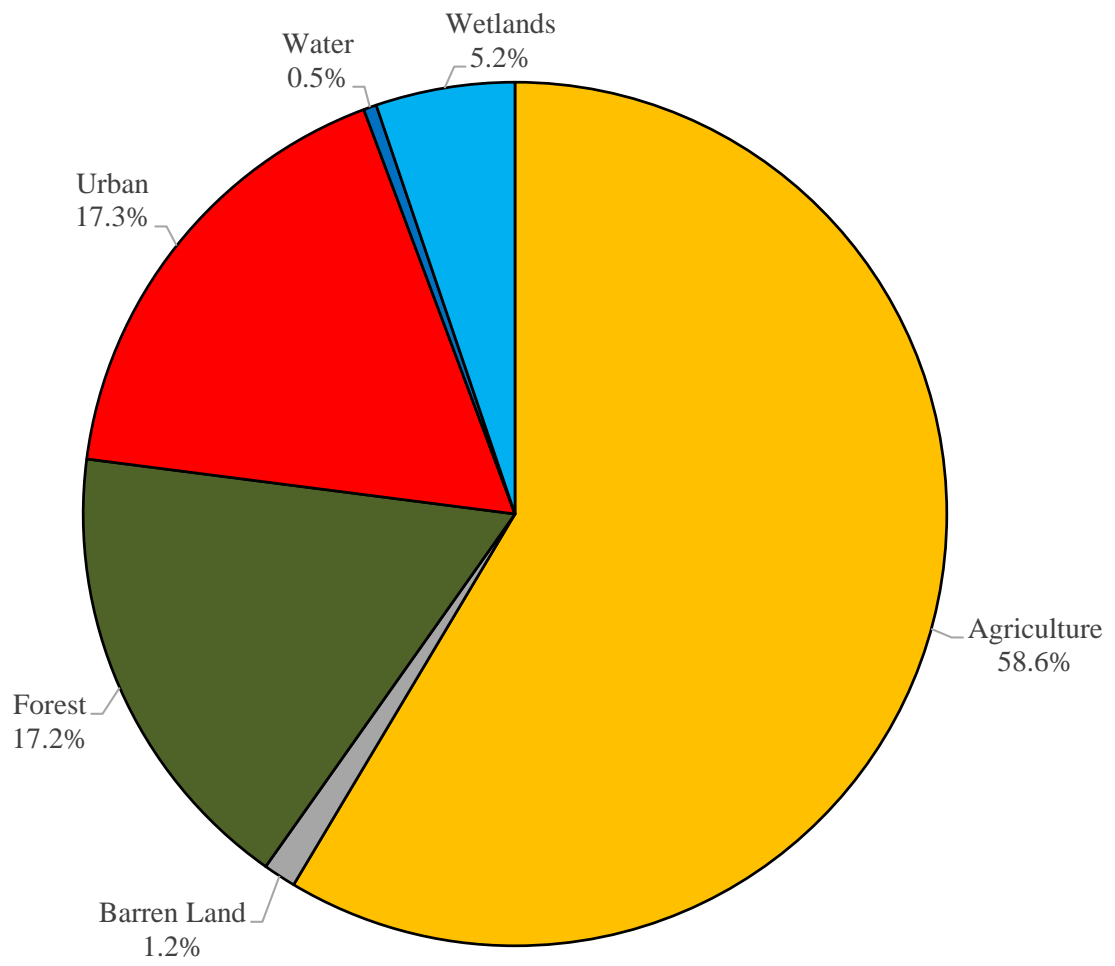


Figure 3: Pie chart illustrating the land use in Upper Deerfield Township

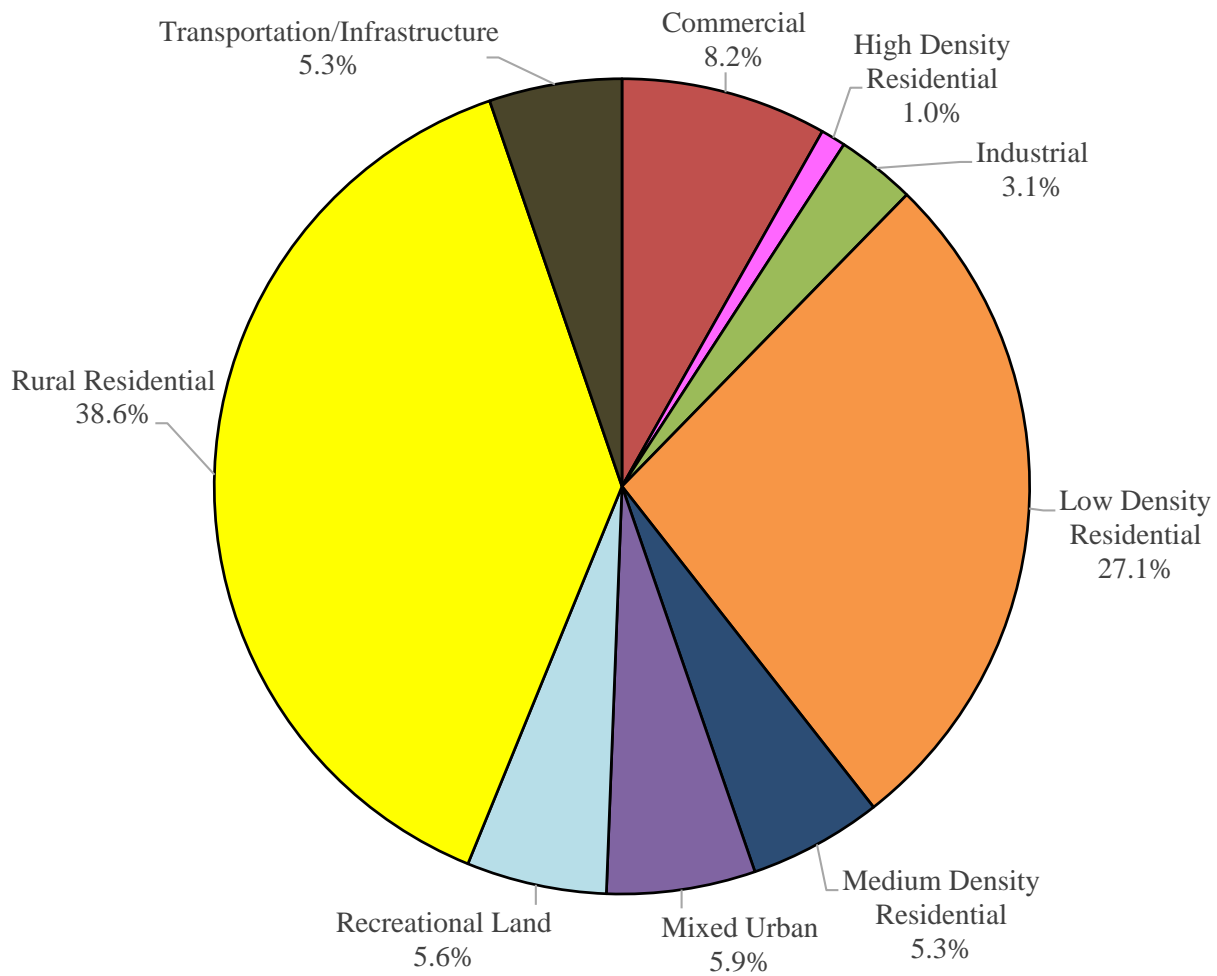


Figure 5: Pie chart illustrating the various types of urban land use in Upper Deerfield Township

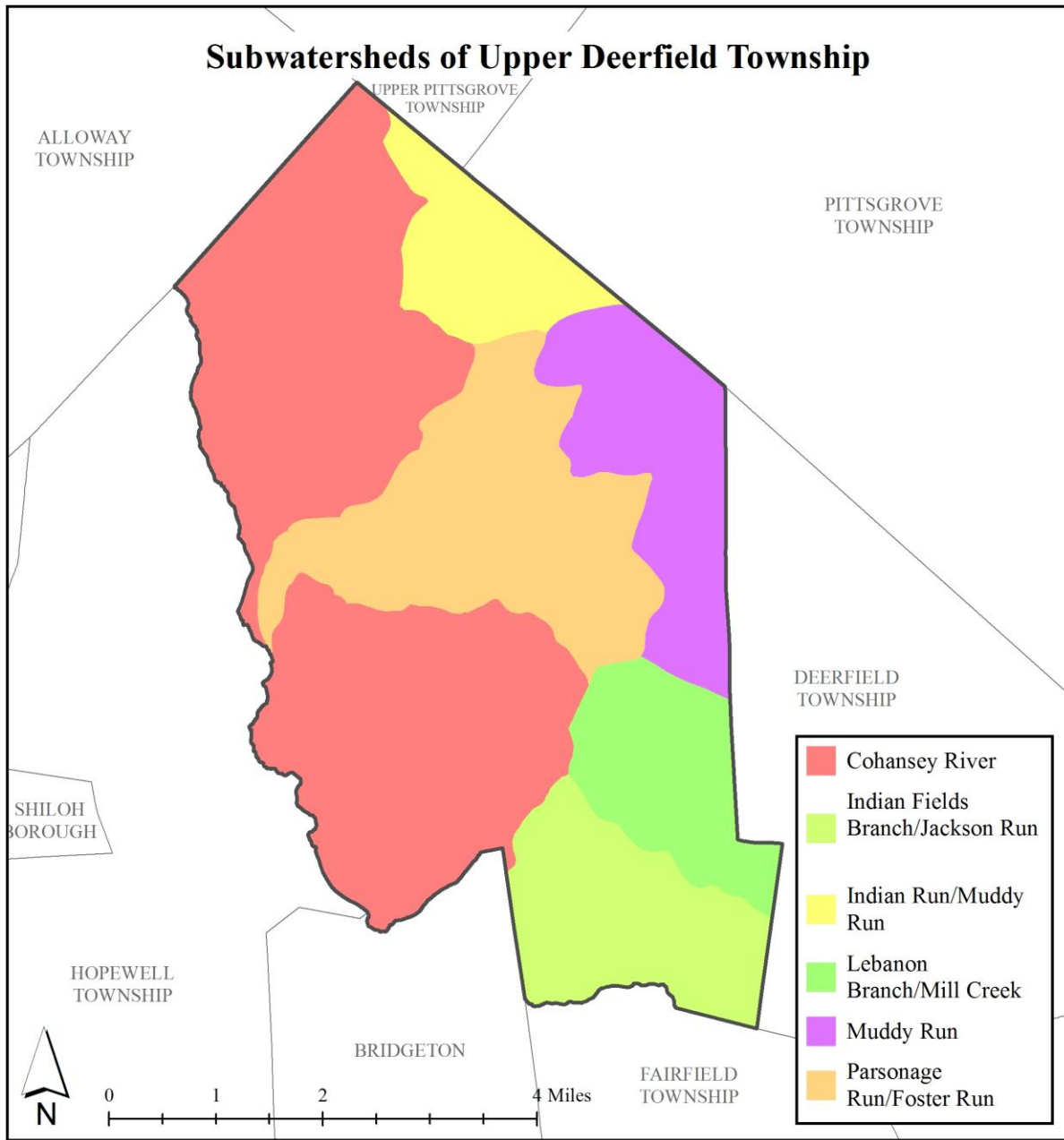


Figure 6: Map of the subwatersheds in Upper Deerfield Township

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 Upper Deerfield 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<sup>2</sup>

<b>Land Cover</b>	<b>TP load (lbs/acre/yr)</b>	<b>TN load (lbs/acre/yr)</b>	<b>TSS load (lbs/acre/yr)</b>
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

---

<sup>2</sup> 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<sup>3</sup>. A wide range of green infrastructure practices have been evaluated for the potential project sites in Upper Deerfield 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.



<sup>3</sup> 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](http://ofmpub.epa.gov/waters10/attains_state.control?p_state=NJ)

### ***Bioretention systems/rain gardens***

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



### ***Downspout planter boxes***

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



### ***Rainwater harvesting systems (cistern or rain barrel)***

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



### ***Bioswale***

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



### ***Stormwater planters***

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



### ***Tree filter boxes***

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



### **Potential Project Sites**

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

---

<sup>4</sup> 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.*



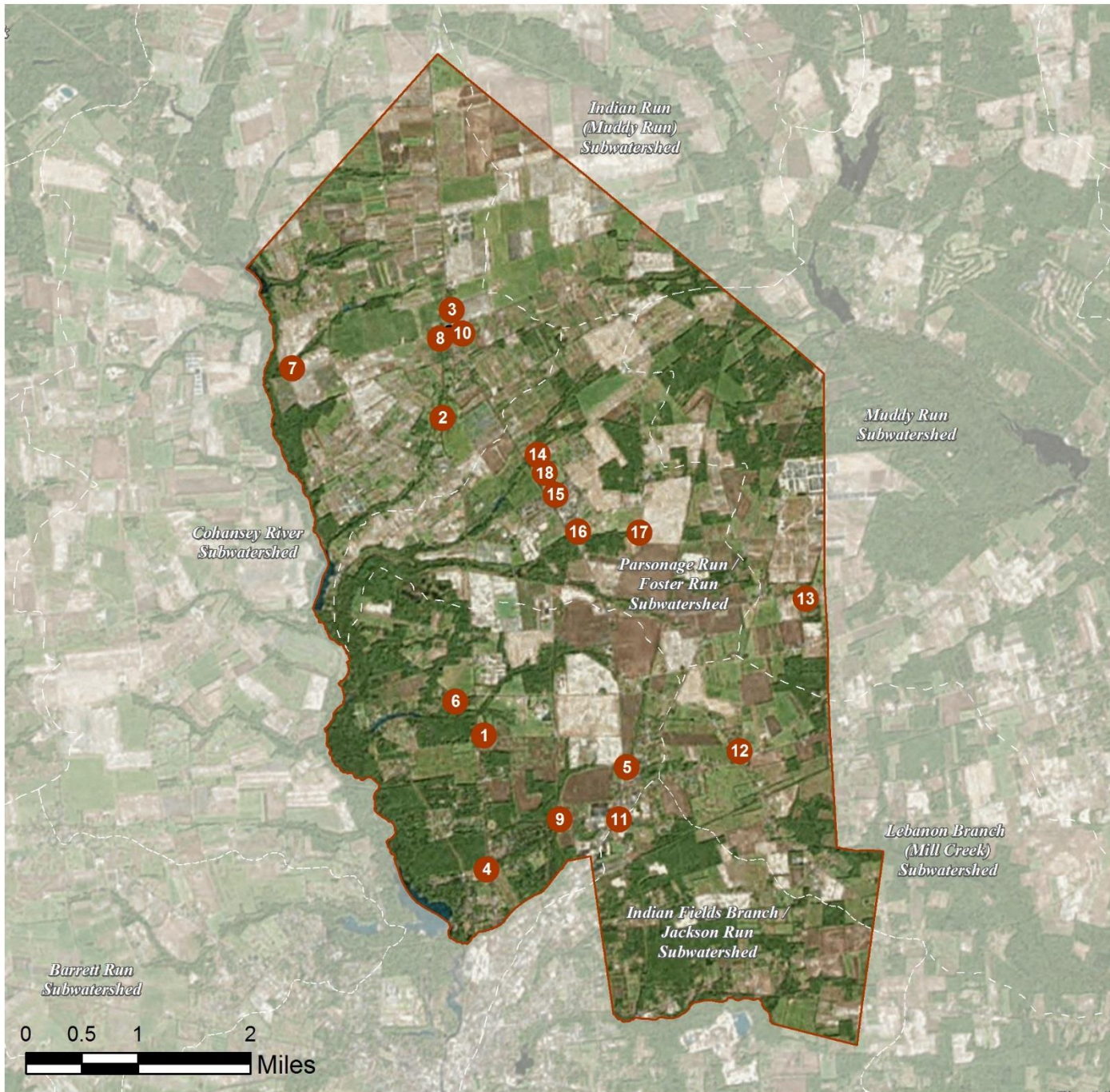
## **Conclusion**

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**

# UPPER DEERFIELD TOWNSHIP: GREEN INFRASTRUCTURE SITES



## SITES WITHIN THE COHANSEY RIVER SUBWATERSHED:

1. Bethel Baptist Church
2. Deerfield Presbyterian Church
3. Deerfield United Methodist Church
4. First Wesleyan Church
5. Padgett Funeral Home
6. Silver Lake Community Church
7. Tri-County Lighthouse Baptist
8. Upper Deerfield Fire Company No. 1
9. Upper Deerfield Township Fire Department
10. US Post Office

## SITES WITHIN THE INDIAN FIELDS BRANCH / JACKSON RUN SUBWATERSHED:

11. New Jersey State Police Department

## SITES WITHIN THE LEBANON BRANCH (MILL CREEK) SUBWATERSHED:

12. Woodruff United Methodist Church

## SITES WITHIN THE MUDDY RUN SUBWATERSHED:

13. Good News Assembly of God Church

## SITES WITHIN THE PARSONAGE RUN / FOSTER RUN SUBWATERSHED:

14. Buddhist Temple
15. Charles F. Seabrook Elementary School / Elizabeth F. Moore School
16. Upper Deerfield Municipal Building & Senior Center
17. Upper Deerfield Township Public Works
18. Woodruff Elementary School

## **b. Proposed Green Infrastructure Concepts**



# BETHEL BAPTIST CHURCH



**Subwatershed:** Cohansey River

**Site Area:** 87,619 sq. ft.

**Address:** 131 Love Lane  
Upper Deerfield, NJ 08302

**Block and Lot:** Block 1109, Lot 2.01, 3

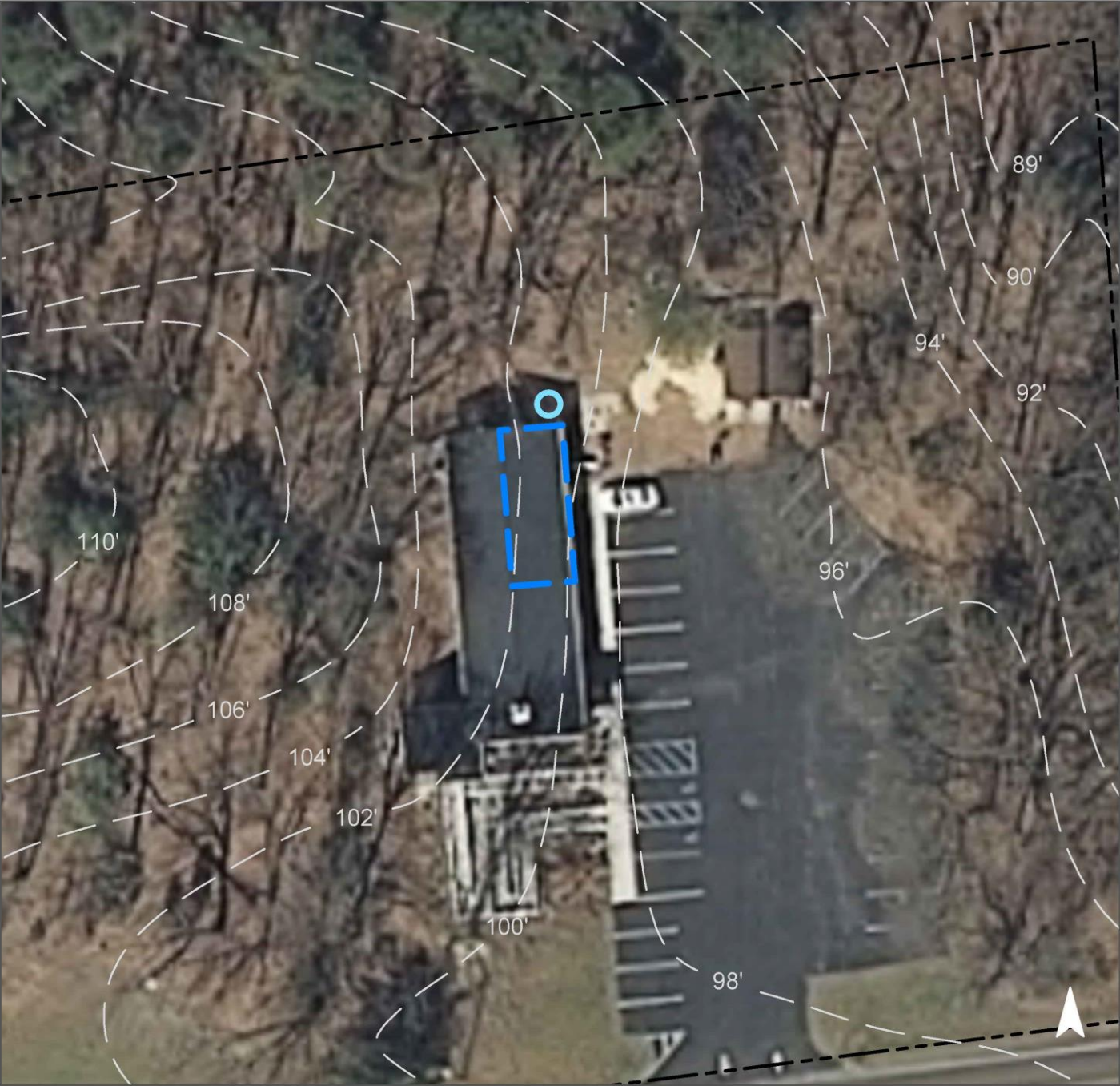


Rainwater draining from the roof can be harvested by installing a cistern. The water can be used to conduct car wash fundraisers or to water the existing landscape at the church. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.





Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
28	24,216	1.2	12.2	111.2	0.019	0.66

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Rainwater harvesting systems	0.017	3	1,200	0.05	1,200 (gal)	\$2,400

# GREEN INFRASTRUCTURE RECOMMENDATIONS



## Bethel Baptist Church

-  rainwater harvesting
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS





# DEERFIELD PRESBYTERIAN CHURCH



**Subwatershed:** Cohansey River

**Site Area:** 198,493 sq. ft.

**Address:** 530 Old Deerfield Pike  
Upper Deerfield, NJ 08302

**Block and Lot:** Block 406, Lot 27



Parking spaces in the southwest corner of the parking lot can be replaced with pervious pavement to capture and infiltrate stormwater. A rain garden can be installed in the grassy medium to capture, treat, and infiltrate runoff from the northern 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"
22	42,783	2.1	21.6	196.4	0.033	1.17

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	0.063	10	4,024	0.12	540	\$2,700
Pervious pavements	0.139	23	8,550	0.27	2,340	\$58,500

# GREEN INFRASTRUCTURE RECOMMENDATIONS



## Deerfield Presbyterian Church

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





# DEERFIELD UNITED METHODIST CHURCH



**Subwatershed:** Cohansey River

**Site Area:** 121,762 sq. ft.

**Address:** 1555 NJ-77  
Upper Deerfield, NJ 08313

**Block and Lot:** Block 202, Lot 18

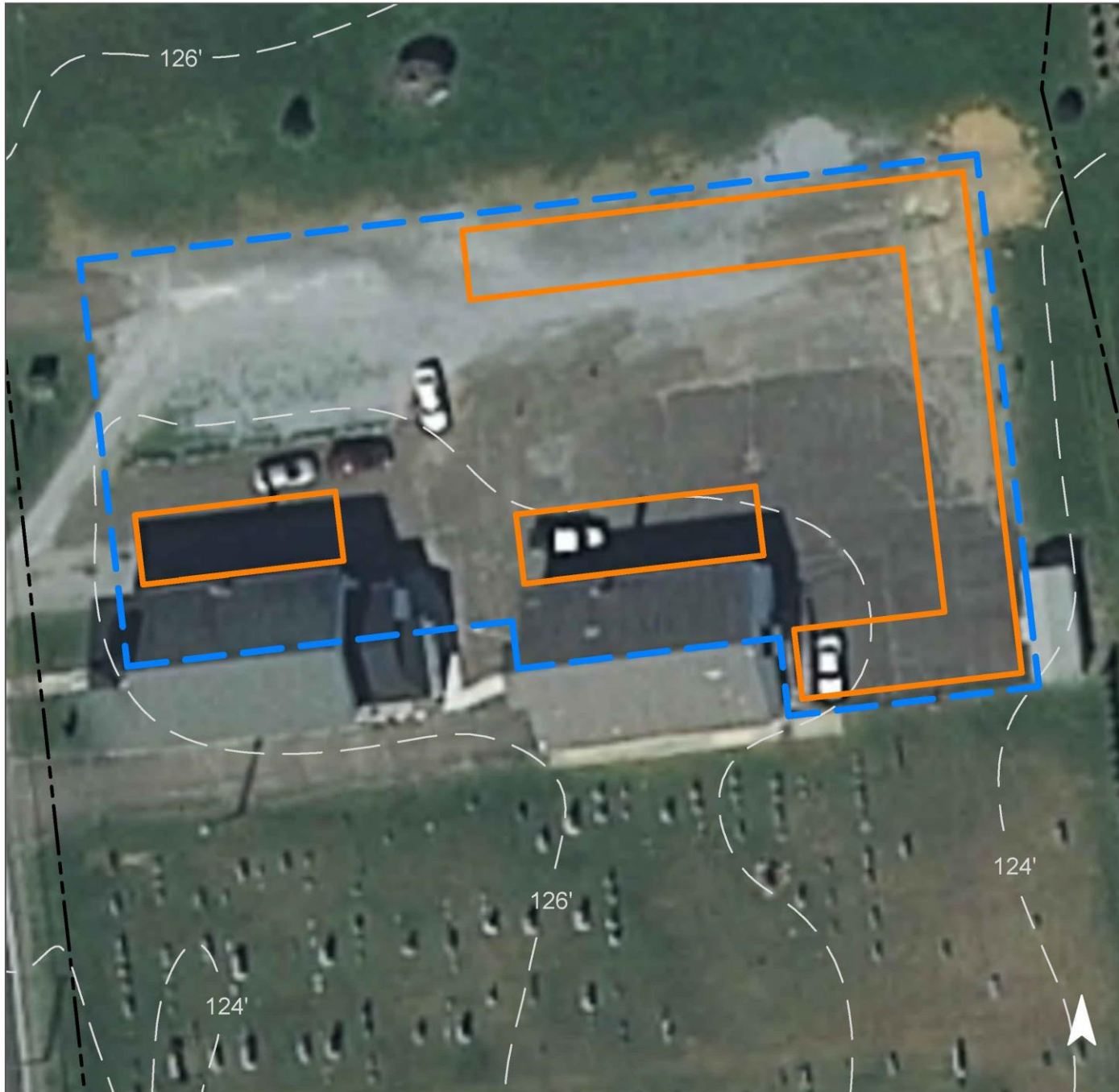


Parking spots can be replaced with porous asphalt to capture and infiltrate stormwater. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.





Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
36	43,927	2.1	22.2	201.7	0.034	1.20

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 pavements	0.720	121	29,987	1.99	7,140	\$178,500

# GREEN INFRASTRUCTURE RECOMMENDATIONS



## Deerfield United Methodist Church

-  pervious pavements
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS





# FIRST WESLEYAN CHURCH



**Subwatershed:** Cohanse River  
**Site Area:** 68,188 sq. ft.  
**Address:** 200 Laurel Heights Drive  
Upper Deerfield, NJ 08302  
**Block and Lot:** Block 1701, Lot 19

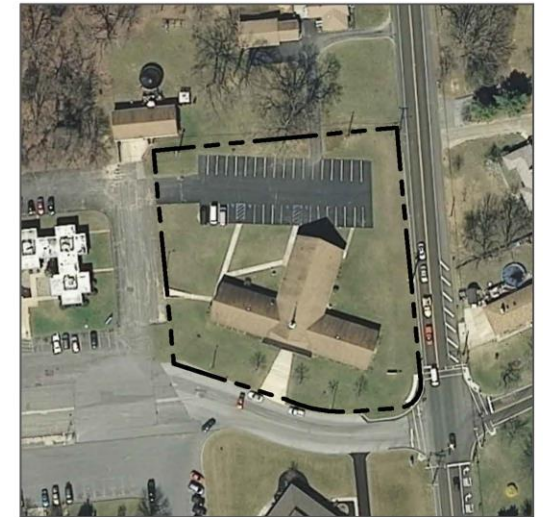
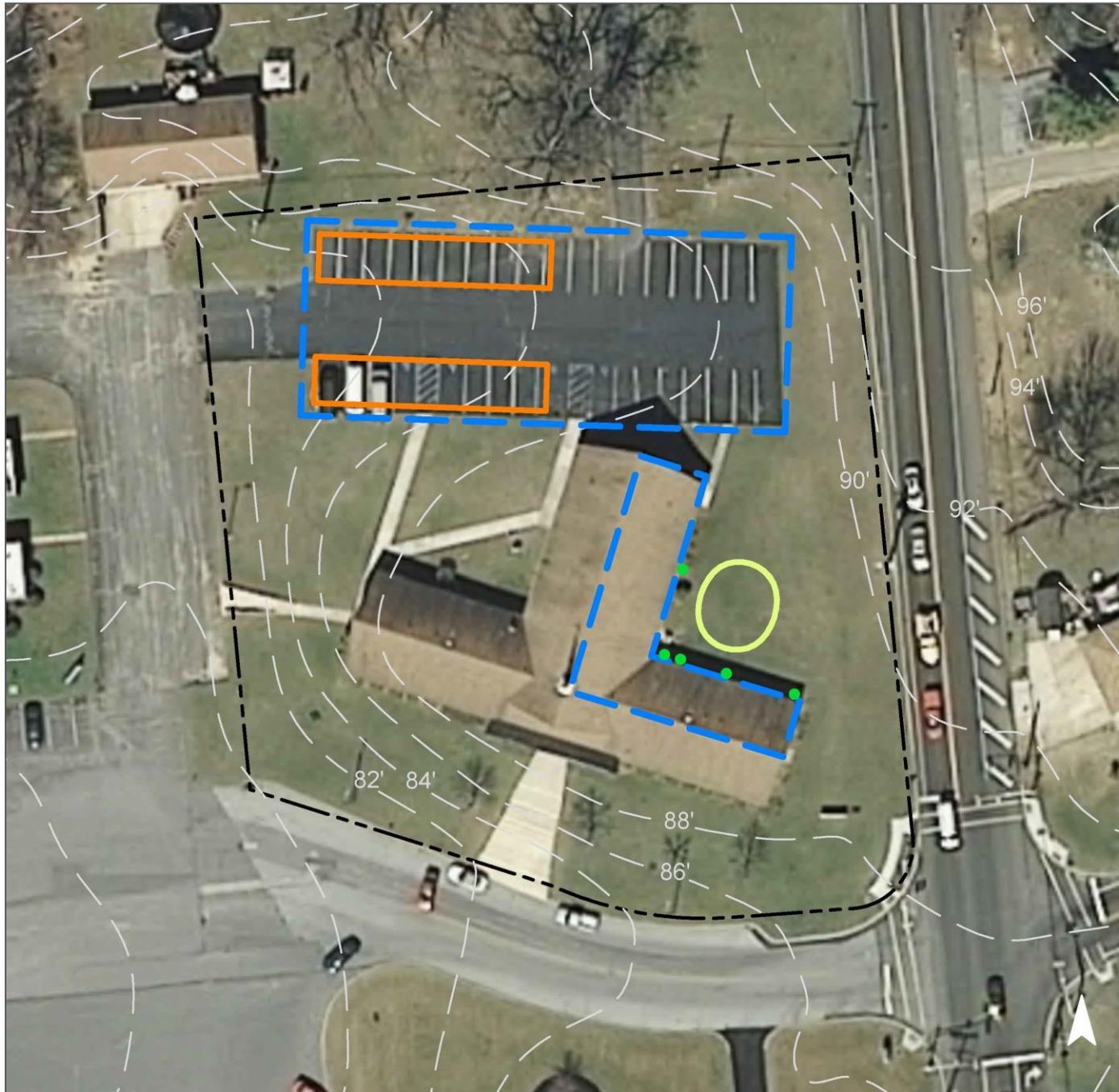


On the eastern side of the church a rain garden can be installed to capture, treat, and infiltrate rooftop runoff by disconnecting and redirecting five nearby downspouts. Pervious pavement can be used to replace existing parking spaces to allow stormwater a chance to infiltrate. A preliminary soil assessment 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"
65	44,218	2.1	22.3	203.0	0.034	1.21

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	0.101	17	9,398	0.28	814	\$4,070
Pervious pavements	0.371	62	27,190	1.02	3,240	\$81,000

# GREEN INFRASTRUCTURE RECOMMENDATIONS



## First Wesleyan Church

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





# PADGETT FUNERAL HOME



**Subwatershed:** Cohansey River

**Site Area:** 119,713 sq. ft.

**Address:** 1107 NJ-77  
Upper Deerfield, NJ 08313

**Block and Lot:** Block 1206, Lot 2



A rain garden can be installed to capture, treat, and infiltrate runoff and mitigate flooding in the northern 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	58,164	2.8	29.4	267.1	0.045	1.60

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	0.248	41	15,035	0.49	2,800	\$14,000

# GREEN INFRASTRUCTURE RECOMMENDATIONS



## Padgett Funeral Home

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



# SILVER LAKE COMMUNITY CHURCH



**Subwatershed:** Cohansey River

**Site Area:** 117,822 sq. ft.

**Address:** 152 Silver Lake Road  
Upper Deerfield, NJ 08302

**Block and Lot:** Block 1107, Lot 15



The existing swale can be converted into bioswale, which would remove pollutants and convey water to the turf grass area. Downspouts can be diverted into the bioswale as well. The parking lot is pitched toward the southwest, therefore the row of parking spaces furthest west in the parking lot can be replaced with porous asphalt to provide stormwater a chance to infiltrate. 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"
13	15,326	0.7	7.7	70.4	0.012	0.42






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	0.035	6	2,573	0.10	1,160	\$5,800
Pervious pavements	0.182	30	13,367	0.50	1,520	\$38,000



# GREEN INFRASTRUCTURE RECOMMENDATIONS



## Silver Lake Community Church

-  pervious pavements
-  bioswales
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS





# TRI-COUNTY LIGHTHOUSE BAPTIST



**Subwatershed:** Cohansey River

**Site Area:** 247,747 sq. ft.

**Address:** 149 Deerfield Drive  
Upper Deerfield, NJ 08302

**Block and Lot:** Block 401 , Lot 4



The existing swale that is functioning as a non-natural conduit is conveying water from parking lot to a turf grass area. The existing conduit can be converted to a bioswale to prompt groundwater recharge and enhance aesthetics. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.





Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
16	39,982	1.9	20.2	183.6	0.031	1.10

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	0.160	27	11,743	0.44	1,400	\$7,000

# GREEN INFRASTRUCTURE RECOMMENDATIONS



## Tri-County Lighthouse Baptist

-  bioswales
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS





# UPPER DEERFIELD FIRE COMPANY NO. 1



**Subwatershed:** Cohansey River

**Site Area:** 59,820 sq. ft.

**Address:** 1542 NJ-77  
Upper Deerfield, NJ 08313

**Block and Lot:** Block 404 , Lot 10,11,12

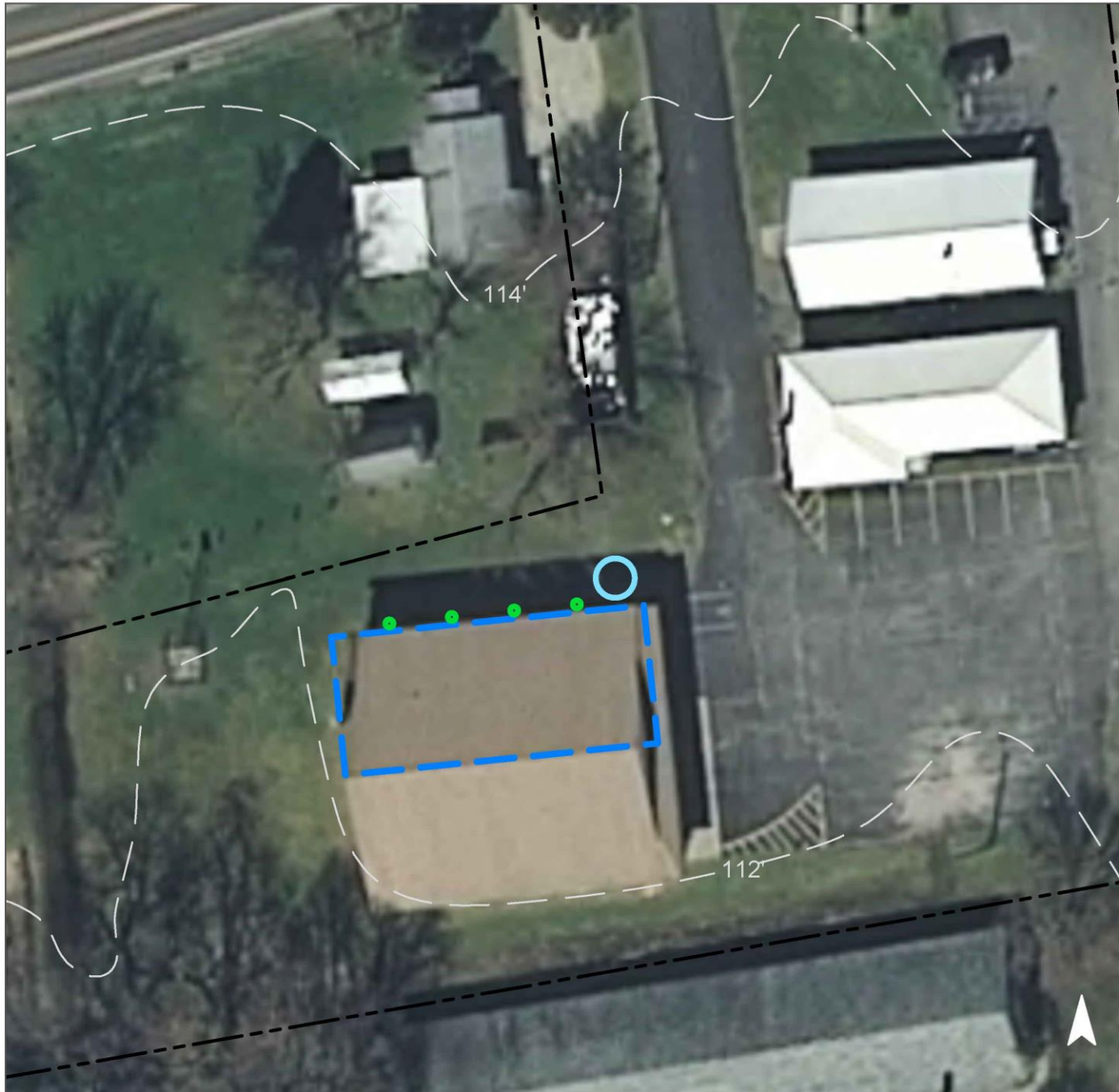


Rainwater can be harvested by installing a cistern at the fire company. The water can be used for cleaning emergency vehicles or for conducting car wash fundraisers. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.






Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
55	32,921	1.6	16.6	151.2	0.026	0.90

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Rainwater harvesting systems	0.076	13	4,500	0.21	4,500 (gal)	\$9,000

# GREEN INFRASTRUCTURE RECOMMENDATIONS



## Upper Deerfield Fire Company Number 1

-  disconnected downspouts
-  rainwater harvesting
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS





# UPPER DEERFIELD TOWNSHIP FIRE DEPARTMENT



**Subwatershed:** Cohanse River  
**Site Area:** 100,025 sq. ft.  
**Address:** 69 Cornwell Drive  
Upper Deerfield, NJ 08302  
**Block and Lot:** Block 1901, Lot 15.01,15.02

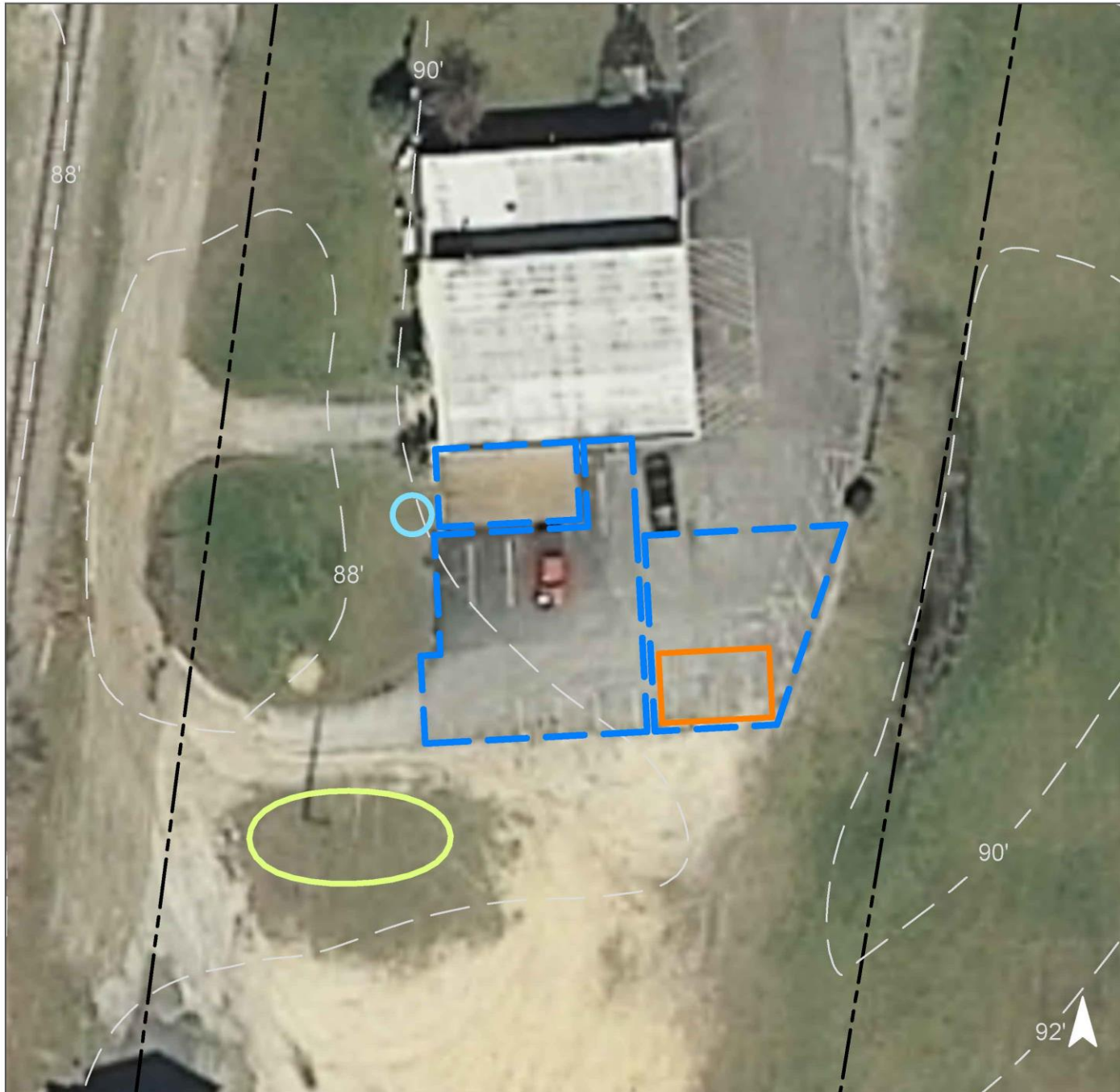


Rainwater can be harvested by installing a cistern at the fire department. The water can be used for cleaning emergency vehicles or for conducting car wash fundraisers. Parking spaces in the southeast corner of the parking lot can be replaced with pervious pavement to capture and infiltrate stormwater. A rain garden can be installed 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"
28	28,366	1.4	14.3	130.2	0.022	0.78

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.083	14	5,146	0.23	844	\$4,220
Pervious pavements	0.055	9	4,989	0.15	515	\$12,875
Rainwater harvesting systems	0.019	3	1,200	0.05	1,200 (gal)	\$2,400

# GREEN INFRASTRUCTURE RECOMMENDATIONS



## Upper Deerfield Township Fire Department

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



# US POST OFFICE



**Subwatershed:** Cohansey River  
**Site Area:** 18,120 sq. ft.  
**Address:** 1542 NJ-77  
Upper Deerfield, NJ 08313  
**Block and Lot:** Block 404, Lot 10



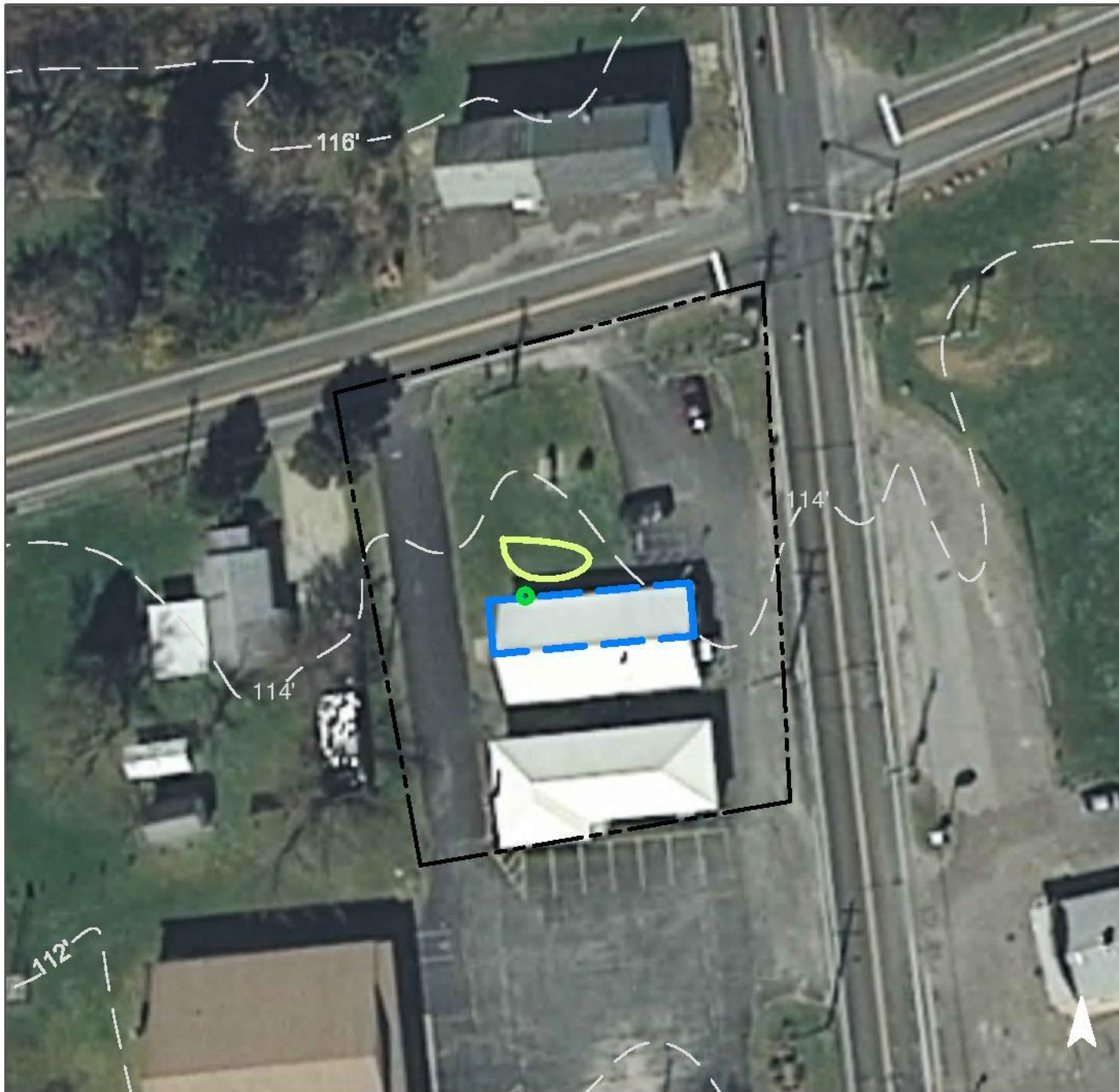
A rain garden can be installed to capture, treat, and infiltrate rooftop runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

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"
55	9,900	0.5	5.0	45.5	0.008	0.27






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	0.029	5	2,139	0.08	275	\$1,375



# GREEN INFRASTRUCTURE RECOMMENDATIONS



## US Post Office

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





# NEW JERSEY STATE POLICE DEPARTMENT



**Subwatershed:** Indian Fields Branch / Jackson Run

**Site Area:** 106,147 sq. ft.

**Address:** 1 Landis Avenue  
Upper Deerfield, NJ 08302

**Block and Lot:** Block 1903, Lot 3.01

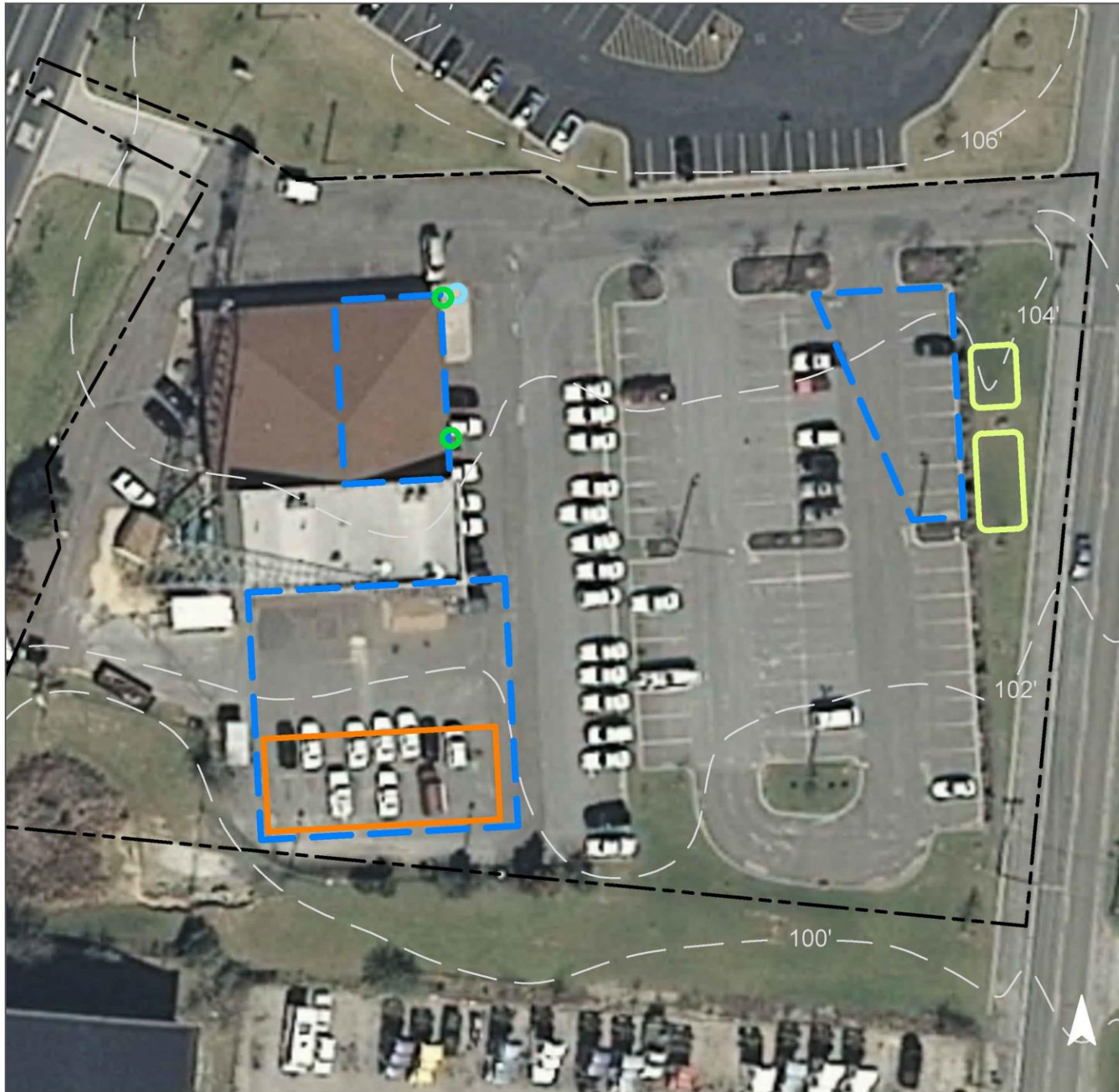


Rainwater can be harvested by installing a cistern off of the northeast corner of the building. The water can be used to wash vehicles or to water the existing landscape. There is sediment build up in the upper east corner of the parking lot. A rain garden can be installed to capture, treat, and infiltrate runoff from the parking lot by making cuts in the curb. Parking spaces can be replaced with pervious pavement to capture and infiltrate stormwater. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.








Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
66	69,785	3.4	35.2	320.4	0.054	1.91

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.085	14	6,260	0.24	1,070	\$5,350
Pervious pavements	0.250	42	18,333	0.69	3,240	\$81,000
Rainwater harvesting systems	0.076	13	4,500	0.21	4,500 (gal)	\$9,000

# GREEN INFRASTRUCTURE RECOMMENDATIONS



## New Jersey State Police Department

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





# WOODRUFF UNITED METHODIST CHURCH



**Subwatershed:** Lebanon Branch (Mill Creek)  
**Site Area:** 163,374 sq. ft.  
**Address:** 4 E Finley Road  
Upper Deerfield, NJ 08302  
**Block and Lot:** Block 2105, Lot 1

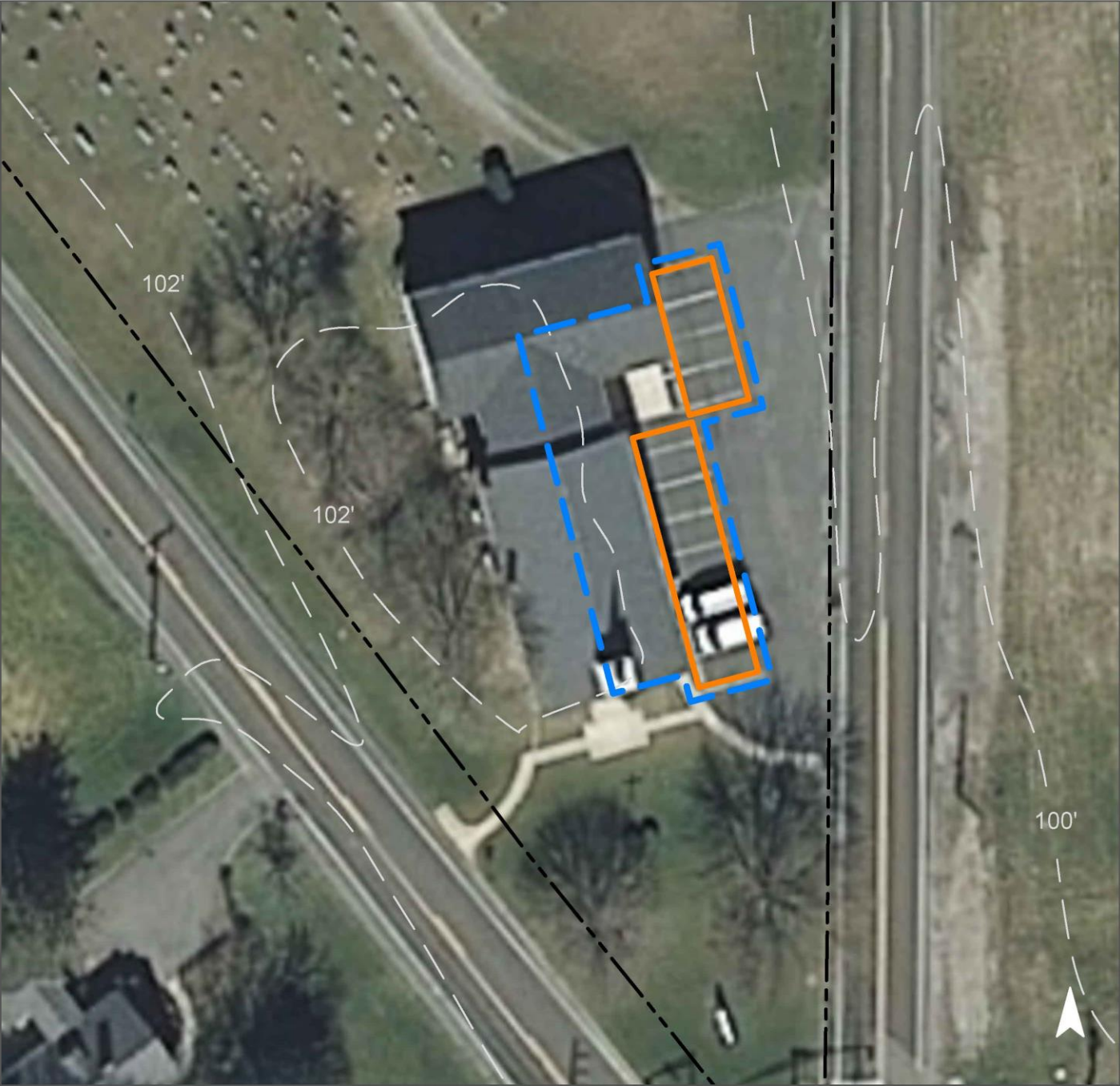


There are multiple downspouts that release rainwater onto the parking lot. Parking spaces can be replaced with pervious pavement to capture and infiltrate stormwater as well as help alleviate the erosion that is occurring across the street. A preliminary soil assessment suggests that the soils have suitable 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"
11	18,024	0.9	9.1	82.8	0.014	0.49

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Pervious pavements	0.126	21	9,275	0.35	1,680	\$42,000

# GREEN INFRASTRUCTURE RECOMMENDATIONS



**Woodruff United Methodist Church**

-  pervious pavements
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS





# GOOD NEWS ASSEMBLY OF GOD CHURCH



**Subwatershed:** Muddy Run

**Site Area:** 59,334 sq. ft.

**Address:** 6 Holly Avenue  
Upper Deerfield, NJ 08302

**Block and Lot:** Block 702, Lot 3, 10

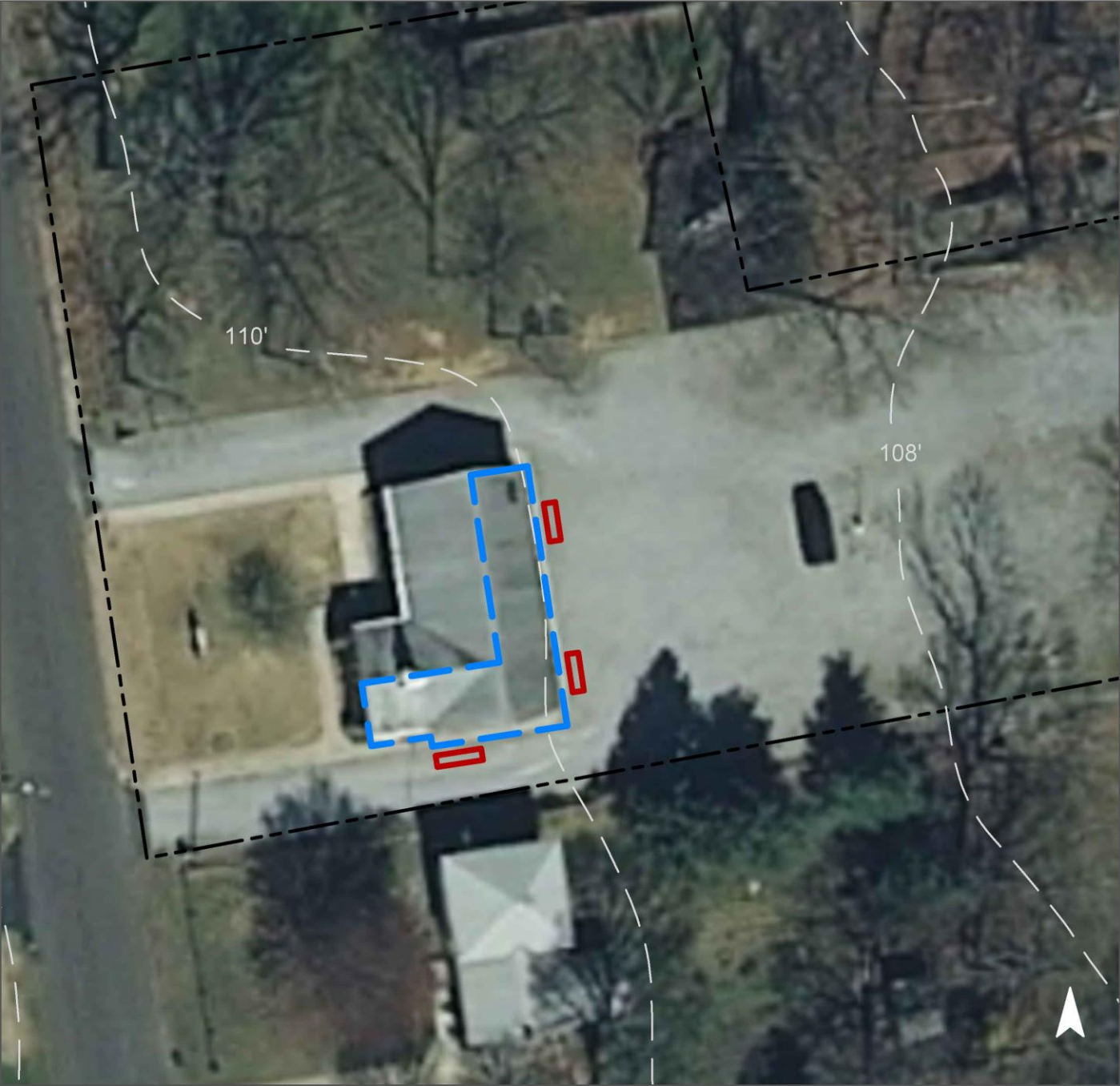


The parking lot is gravel, and the church has a basement. Downspout planter boxes can be constructed along the east and south side of the building to allow roof runoff to be reused. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.





Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
73	43,589	2.1	22.0	200.1	0.034	1.20

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
Downspout planter boxes	0.044	6	n/a	n/a	96	\$8,000

# GREEN INFRASTRUCTURE RECOMMENDATIONS



## Good News Assembly of God Church

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





# BUDDHIST TEMPLE



**Subwatershed:** Parsonage Run / Foster Run

**Site Area:** 272,060 sq. ft.

**Address:** 9 Northville Road  
Upper Deerfield, NJ 08302

**Block and Lot:** Block 502, Lot 7



Off of the southwest corner of the building there is a downspout that could be redirected into a downspout planter box to reuse roof runoff. At the time of the assessment the parking lot was in poor condition. When it comes time to repave, parking spaces can be replaced with pervious pavement to capture and infiltrate stormwater. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.







Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
17	46,179	2.2	23.3	212.0	0.036	1.27

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Downspout planter boxes	0.011	1	n/a	n/a	24	\$2,000
Pervious pavements	0.345	58	25,350	0.95	3,250	\$81,250

# GREEN INFRASTRUCTURE RECOMMENDATIONS



## Buddhist Temple

-  disconnected downspouts
-  pervious pavements
-  downspout planter boxes
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS





# CHARLES F. SEABROOK SCHOOL / ELIZABETH F. MOORE SCHOOL



**Subwatershed:** Parsonage Run / Foster Run

**Site Area:** 809,987 sq. ft.

**Address:** 1373 NJ-77  
Upper Deerfield, NJ 08302

**Block and Lot:** Block 813, Lot 2,3,4



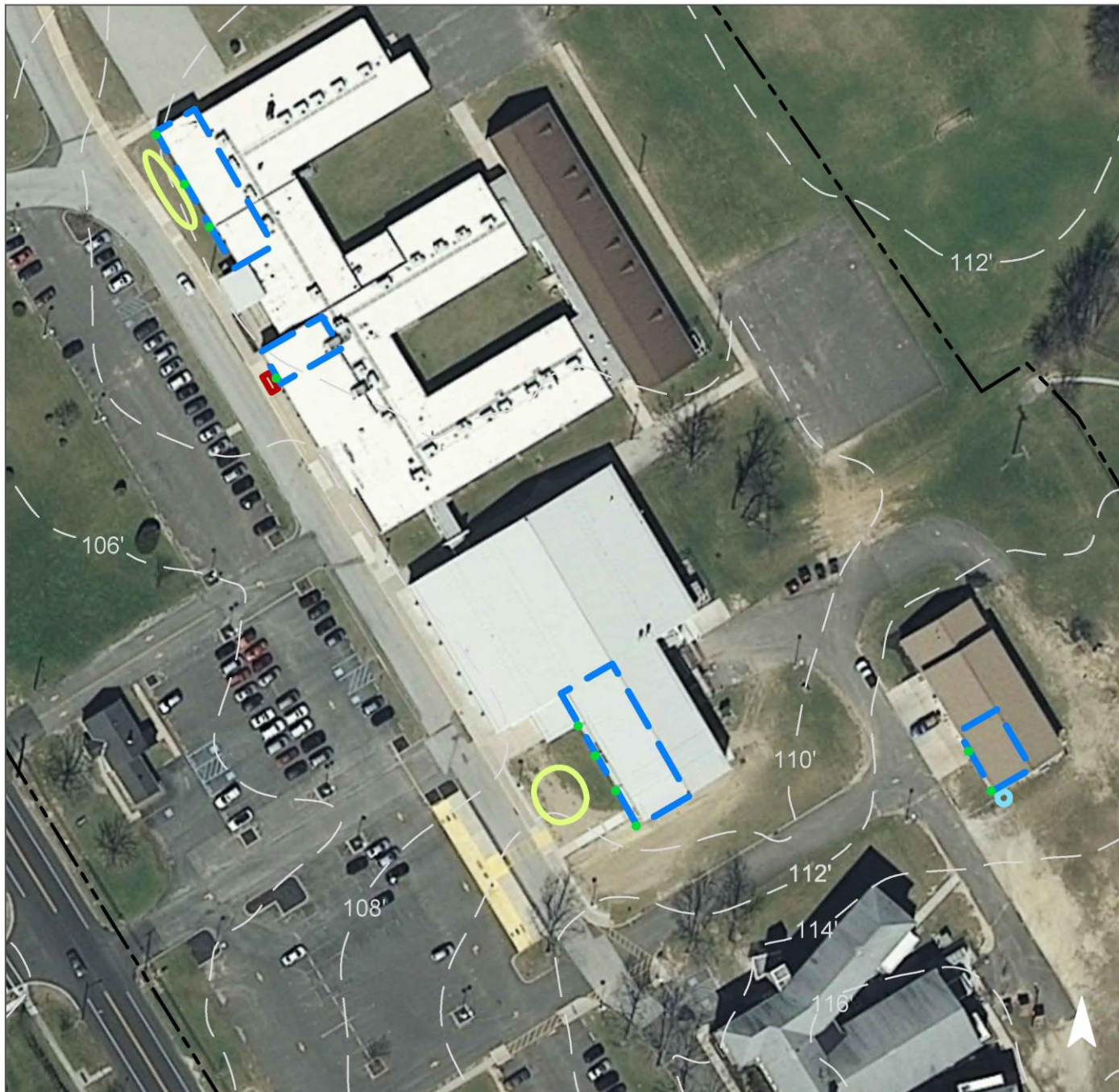
A downspout planter box can be constructed to allow roof runoff to be captured and reused. Two rain gardens can be installed to capture, treat, and infiltrate rooftop runoff by disconnecting and redirecting nearby downspouts. Additionally, a cistern can be installed to harvest rainwater off of the building located in the southeast section of the block. The water can be used to water the existing landscaping or to wash 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"
46	373,364	18.0	188.6	1,714.3	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 systems	0.176	30	12,940	0.49	1,510	\$7,550
Downspout planter boxes	0.028	4	n/a	n/a	60	\$5,000
Rainwater harvesting systems	0.033	6	2,000	0.09	2,000 (gal)	\$4,000



# GREEN INFRASTRUCTURE RECOMMENDATIONS



**Charles F. Seabrook School / Elizabeth F. Moore School**

-  disconnected downspouts
-  bioretention / rain gardens
-  downspout planter boxes
-  rainwater harvesting
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS





# UPPER DEERFIELD MUNICIPAL BUILDING & SENIOR CENTER



**Subwatershed:** Parsonage Run / Foster Run

**Site Area:** 279,565 sq. ft.

**Address:** 1325 NJ-77  
Upper Deerfield, NJ 08302

**Block and Lot:** Block 803, Lot 3

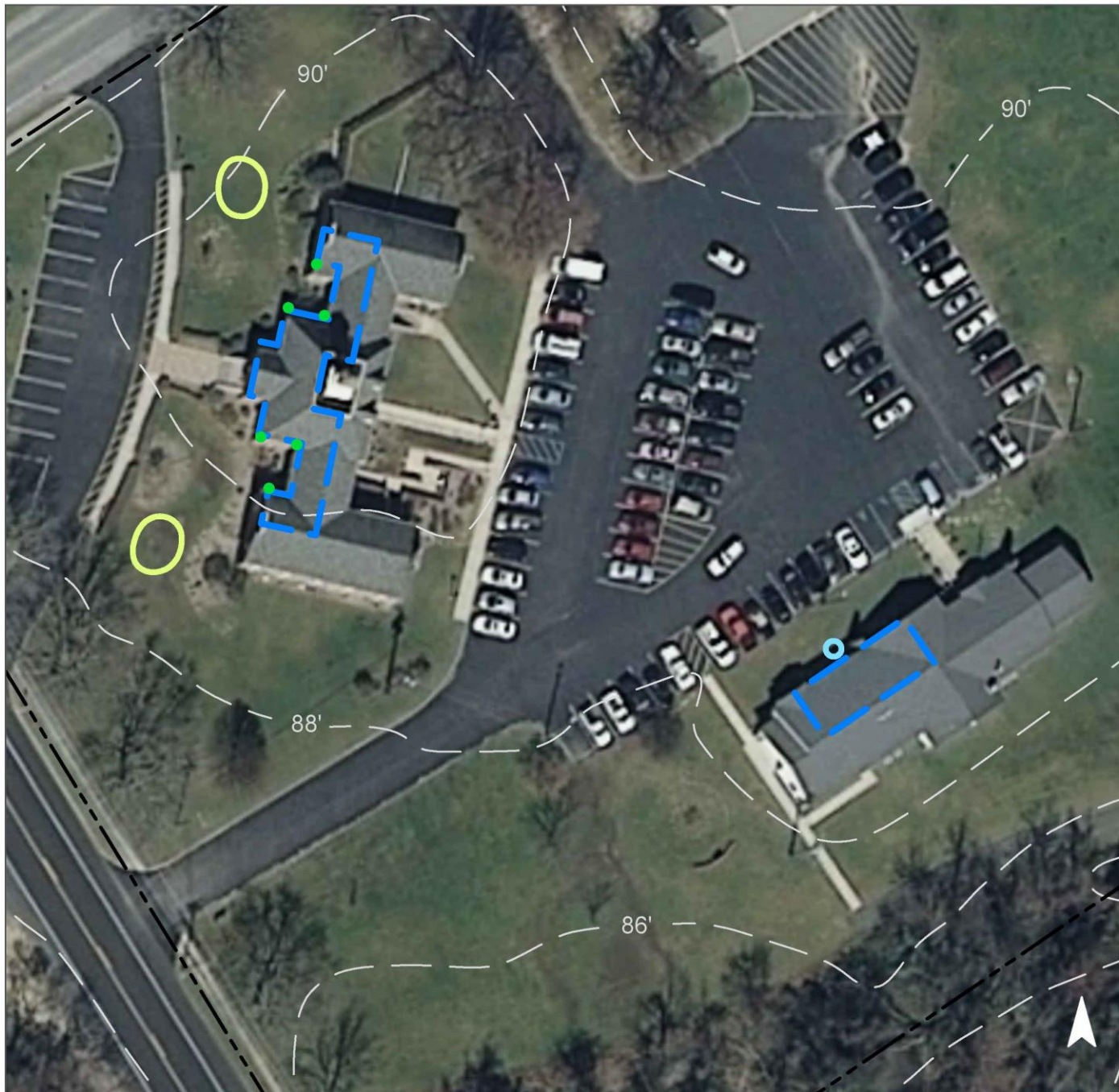


There are directly connected downspouts along the front of the municipal building that are piped to the driveway and drain to a detention basin across the street. Two rain gardens can be installed to capture, treat, and infiltrate rooftop runoff by disconnecting and redirecting nearby downspouts in this area. Additionally, a cistern can be installed in the front of the Senior Center to harvest rainwater. The water can be used for the existing landscaping. 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	95,018	4.6	48.0	436.3	0.074	2.61

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	0.064	11	4,690	0.18	650	\$3,250
Rainwater harvesting systems	0.028	5	2,000	0.08	2,000 (gal)	\$4,000

# GREEN INFRASTRUCTURE RECOMMENDATIONS



## Upper Deerfield Municipal Building & Senior Center

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





# UPPER DEERFIELD TOWNSHIP PUBLIC WORKS



**Subwatershed:** Parsonage Run / Foster Run

**Site Area:** 468,267 sq. ft.

**Address:** 80 Old Burlington Road  
Upper Deerfield, NJ 08302

**Block and Lot:** Block 803, Lot 10



A rain garden can be installed to capture, treat, and infiltrate runoff from the recreational field. Additionally, cisterns can be installed by two buildings to capture roof runoff, which can be recycled for washing trucks. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
17	78,429	3.8	39.6	360.1	0.061	2.15







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	0.091	15	5,535	0.18	930	\$4,650
Rainwater harvesting systems	0.076	13	4,638	0.15	2,300 (gal)	\$4,600



# GREEN INFRASTRUCTURE RECOMMENDATIONS



## Upper Deerfield Twp Public Works

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



# WOODRUFF ELEMENTARY SCHOOL



**Subwatershed:** Parsonage Run / Foster Run

**Site Area:** 816,592 sq. ft.

**Address:** 1373 NJ-77  
Upper Deerfield, NJ 08302

**Block and Lot:** Block 813, Lot 2



The downspouts at the school are directly connected, draining into the street which flows into the basin. Rain gardens can be built in three turf grass areas in front of the school to capture, treat, and infiltrate rooftop runoff by disconnecting and redirecting nearby downspouts. A row of parking spots can be replaced with pervious pavement to infiltrate stormwater generated by 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"
24	192,148	9.3	97.0	882.2	0.150	5.27



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	0.146	24	21,124	0.79	1,989	\$9,945
Pervious pavements	0.390	65	55,000	2.07	3,870	\$96,750



# GREEN INFRASTRUCTURE RECOMMENDATIONS



**Woodruff Elementary School**

-  disconnected downspouts
-  pervious pavements
-  bioretention / rain gardens
-  drainage areas
-  property line
-  2012 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			I.C. %	I.C. Area (ac)	I.C. Area (SF)	Runoff Volumes from I.C.	
					TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)				Water Quality Storm (1.25" over 2-hours) (Mgal)	Annual (Mgal)
<b>COHANSEY RIVER SUBWATERSHED</b>	<b>26.15</b>	<b>1,139,309</b>			<b>16.4</b>	<b>171.6</b>	<b>1,560.2</b>		<b>7.80</b>	<b>339,803</b>	<b>0.265</b>	<b>9.32</b>
<b>Bethel Baptist Church</b>												
<b>Total Site Info</b>	2.01	87,619	1109	2.01,3	1.2	12.2	111.2	28	0.56	24,216	0.019	0.66
<b>Deerfield Presbyterian Church</b>												
<b>Total Site Info</b>	4.56	198,493	406	27	2.1	21.6	196.4	22	0.98	42,783	0.033	1.17
<b>Deerfield United Methodist Church</b>												
<b>Total Site Info</b>	2.80	121,762	202	18	2.1	22.2	201.7	36	1.01	43,927	0.034	1.20
<b>First Wesleyan Church</b>												
<b>Total Site Info</b>	1.57	68,188	1701	19	2.1	22.3	203.0	65	1.02	44,218	0.034	1.21
<b>Padgett Funeral Home</b>												
<b>Total Site Info</b>	2.75	119,713	1206	2	2.8	29.4	267.1	49	1.34	58,164	0.045	1.60
<b>Silver Lake Community Church</b>												
<b>Total Site Info</b>	2.70	117,822	1107	15	0.7	7.7	70.4	13	0.35	15,326	0.012	0.42
<b>Tri-County Lighthouse Baptist</b>												
<b>Total Site Info</b>	5.69	247,747	401	4	1.9	20.2	183.6	16	0.92	39,982	0.031	1.10
<b>Upper Deerfield Fire Company No. 1</b>												
<b>Total Site Info</b>	1.37	59,820	404	10,11,12	1.6	16.6	151.2	55	0.76	32,921	0.026	0.90
<b>Upper Deerfield Township Fire Department</b>												
<b>Total Site Info</b>	2.30	100,025	1901	15.01,15.02	1.4	14.3	130.2	28	0.65	28,366	0.022	0.78
<b>US Post Office</b>												
<b>Total Site Info</b>	0.42	18,120	404	10	0.5	5.0	45.5	55	0.23	9,900	0.008	0.27
<b>INDIAN FIELDS BRANCH / JACKSON RUN SUBWATERSHED</b>	<b>2.44</b>	<b>106,147</b>			<b>3.4</b>	<b>35.2</b>	<b>320.4</b>		<b>1.60</b>	<b>69,785</b>	<b>0.054</b>	<b>1.91</b>
<b>New Jersey State Police Department</b>												
<b>Total Site Info</b>	2.44	106,147	1903	3.01	3.4	35.2	320.4	66	1.60	69,785	0.054	1.91

**Summary of Existing Site Conditions**

Subwatershed/Site Name/Total Site Info/GI Practice	Area (ac)	Area (SF)	Block	Lot	Existing Annual Loads			I.C. %	I.C. Area (ac)	I.C. Area (SF)	Runoff Volumes from I.C.	
					TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)				Water Quality Storm (1.25" over 2-hours) (Mgal)	Annual (Mgal)
<b>LEBANON BRANCH (MILL CREEK) SUBWATERSHED</b>	<b>3.75</b>	<b>163,374</b>			<b>0.9</b>	<b>9.1</b>	<b>82.8</b>		<b>0.41</b>	<b>18,024</b>	<b>0.014</b>	<b>0.49</b>
<b>Woodruff United Methodist Church Total Site Info</b>	3.75	163,374	2105	1	0.9	9.1	82.8	11	0.41	18,024	0.014	0.49
<b>MUDDY RUN SUBWATERSHED</b>	<b>1.36</b>	<b>59,334</b>			<b>2.1</b>	<b>22.0</b>	<b>200.1</b>		<b>1.00</b>	<b>43,589</b>	<b>0.034</b>	<b>1.20</b>
<b>Good News Assembly of God Church Total Site Info</b>	1.36	59,334	702	3,10	2.1	22.0	200.1	73	1.00	43,589	0.034	1.20
<b>PARSONAGE RUN / FOSTER RUN SUBWATERSHED</b>	<b>60.75</b>	<b>2,646,471</b>			<b>37.9</b>	<b>396.5</b>	<b>3,604.9</b>		<b>18.02</b>	<b>785,139</b>	<b>0.612</b>	<b>21.53</b>
<b>Buddhist Temple Total Site Info</b>	6.25	272,060	502	7	2.2	23.3	212.0	17	1.06	46,179	0.036	1.27
<b>Charles F. Seabrook School / Elizabeth F. Moore School Total Site Info</b>	18.59	809,987	813	2,3,4	18.0	188.6	1,714.3	46	8.57	373,364	0.291	10.24
<b>Upper Deerfield Municipal Building &amp; Senior Center Total Site Info</b>	6.42	279,565	803	3	4.6	48.0	436.3	34	2.18	95,018	0.074	2.61
<b>Upper Deerfield Township Public Works Total Site Info</b>	10.75	468,267	803	10	3.8	39.6	360.1	17	1.80	78,429	0.061	2.15
<b>Woodruff Elementary School Total Site Info</b>	18.75	816,592	813	2	9.3	97.0	882.2	24	4.41	192,148	0.150	5.27



#### **d. Summary of Proposed Green Infrastructure Practices**

**Summary of Proposed Green Infrastructure Practices**

Subwatershed/Site Name/Total Site Info/GI Practice	Potential Management Area		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 %
	Area (SF)	Area (ac)									
<b>COHANSEY RIVER SUBWATERSHED</b>	<b>88,190</b>	<b>1.99</b>	<b>2.26</b>	<b>379</b>	<b>141,041</b>	<b>5.98</b>	<b>29,488</b>			<b>\$421,840</b>	<b>26.0%</b>
<b>1 Bethel Baptist Church</b>											
Rainwater harvesting systems	665	0.02	0.017	3	1,200	0.05	1,200	2	gal	\$2,400	2.7%
<b>Total Site Info</b>	<b>665</b>	<b>0.02</b>	<b>0.017</b>	<b>3</b>	<b>1,200</b>	<b>0.05</b>	<b>1,200</b>			<b>\$2,400</b>	<b>2.7%</b>
<b>2 Deerfield Presbyterian Church</b>											
Bioretention systems	2,400	0.06	0.063	10	4,024	0.12	540	5	SF	\$2,700	5.6%
Pervious pavements	5,350	0.12	0.139	23	8,550	0.27	2,340	25	SF	\$58,500	12.5%
<b>Total Site Info</b>	<b>7,750</b>	<b>0.18</b>	<b>0.202</b>	<b>34</b>	<b>12,574</b>	<b>0.39</b>	<b>2,880</b>			<b>\$61,200</b>	<b>18.1%</b>
<b>3 Deerfield United Methodist Church</b>											
Pervious pavements	27,650	0.63	0.720	121	29,987	1.99	7,140	25	SF	\$178,500	62.9%
<b>Total Site Info</b>	<b>27,650</b>	<b>0.63</b>	<b>0.720</b>	<b>121</b>	<b>29,987</b>	<b>1.99</b>	<b>7,140</b>			<b>\$178,500</b>	<b>62.9%</b>
<b>4 First Wesleyan Church</b>											
Bioretention systems	3,870	0.09	0.101	17	9,398	0.28	814	5	SF	\$4,070	8.8%
Pervious pavements	14,220	0.33	0.371	62	27,190	1.02	3,240	25	SF	\$81,000	32.2%
<b>Total Site Info</b>	<b>18,090</b>	<b>0.42</b>	<b>0.471</b>	<b>79</b>	<b>36,588</b>	<b>1.30</b>	<b>4,054</b>			<b>\$85,070</b>	<b>40.9%</b>
<b>5 Padgett Funeral Home</b>											
Bioretention systems	9,500	0.22	0.248	41	15,035	0.49	2,800	5	SF	\$14,000	16.3%
<b>Total Site Info</b>	<b>9,500</b>	<b>0.22</b>	<b>0.248</b>	<b>41</b>	<b>15,035</b>	<b>0.49</b>	<b>2,800</b>			<b>\$14,000</b>	<b>16.3%</b>
<b>6 Silver Lake Community Church</b>											
Bioswale	1,345	0.03	0.035	6	2,573	0.10	1,160	5	SF	\$5,800	8.8%
Pervious pavements	6,990	0.16	0.182	30	13,367	0.50	1,520	25	SF	\$38,000	45.6%
<b>Total Site Info</b>	<b>8,335</b>	<b>0.16</b>	<b>0.182</b>	<b>30</b>	<b>15,940</b>	<b>0.60</b>	<b>2,680</b>			<b>\$43,800</b>	<b>54.4%</b>
<b>7 Tri-County Lighthouse Baptist</b>											
Bioswale	6,140	0.14	0.160	27	11,743	0.44	1,400	5	SF	\$7,000	15.4%
<b>Total Site Info</b>	<b>6,140</b>	<b>0.14</b>	<b>0.160</b>	<b>27</b>	<b>11,743</b>	<b>0.44</b>	<b>1,400</b>			<b>\$7,000</b>	<b>15.4%</b>
<b>8 Upper Deerfield Fire Company No. 1</b>											
Rainwater harvesting systems	2,910	0.07	0.076	13	4,500	0.21	4,500	2	gal	\$9,000	8.8%
<b>Total Site Info</b>	<b>2,910</b>	<b>0.07</b>	<b>0.076</b>	<b>13</b>	<b>4,500</b>	<b>0.21</b>	<b>4,500</b>			<b>\$9,000</b>	<b>8.8%</b>

**Summary of Proposed Green Infrastructure Practices**

Subwatershed/Site Name/Total Site Info/GI Practice	Potential Management Area		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 %
	Area (SF)	Area (ac)									
<b>9 Upper Deerfield Township Fire Department</b>											
Bioretention systems	3,190	0.07	0.083	14	5,146	0.23	844	5	SF	\$4,220	11.2%
Pervious pavements	2,110	0.05	0.055	9	4,989	0.15	515	25	SF	\$12,875	7.4%
Rainwater harvesting systems	730	0.02	0.019	3	1,200	0.05	1,200	2	gal	\$2,400	2.6%
<b>Total Site Info</b>	<b>6,030</b>	<b>0.14</b>	<b>0.157</b>	<b>26</b>	<b>11,335</b>	<b>0.43</b>	<b>2,559</b>			<b>\$19,495</b>	<b>21.3%</b>
<b>10 US Post Office</b>											
Bioretention systems	1,120	0.03	0.029	5	2,139	0.08	275	5	SF	\$1,375	11.3%
<b>Total Site Info</b>	<b>1,120</b>	<b>0.03</b>	<b>0.029</b>	<b>5</b>	<b>2,139</b>	<b>0.08</b>	<b>275</b>			<b>\$1,375</b>	<b>11.3%</b>
<b>INDIAN FIELDS BRANCH / JACKSON RUN SUBWATERSHED</b>	<b>15,800</b>	<b>0.36</b>	<b>0.412</b>	<b>69</b>	<b>29,093</b>	<b>1.14</b>	<b>8,810</b>			<b>\$95,350</b>	<b>22.6%</b>
<b>11 New Jersey State Police Department</b>											
Bioretention systems	3,275	0.08	0.085	14	6,260	0.24	1,070	5	SF	\$5,350	4.7%
Pervious pavements	9,590	0.22	0.250	42	18,333	0.69	3,240	25	SF	\$81,000	13.7%
Rainwater harvesting systems	2,935	0.07	0.076	13	4,500	0.21	4,500	2	gal	\$9,000	4.2%
<b>Total Site Info</b>	<b>15,800</b>	<b>0.36</b>	<b>0.412</b>	<b>69</b>	<b>29,093</b>	<b>1.14</b>	<b>8,810</b>			<b>\$95,350</b>	<b>22.6%</b>
<b>LEBANON BRANCH (MILL CREEK) SUBWATERSHED</b>	<b>4,850</b>	<b>0.11</b>	<b>0.126</b>	<b>21</b>	<b>9,275</b>	<b>0.35</b>	<b>1,680</b>			<b>\$42,000</b>	<b>26.9%</b>
<b>12 Woodruff United Methodist Church</b>											
Pervious pavements	4,850	0.11	0.126	21	9,275	0.35	1,680	25	SF	\$42,000	26.9%
<b>Total Site Info</b>	<b>4,850</b>	<b>0.11</b>	<b>0.126</b>	<b>21</b>	<b>9,275</b>	<b>0.35</b>	<b>1,680</b>			<b>\$42,000</b>	<b>26.9%</b>
<b>MUDDY RUN SUBWATERSHED</b>	<b>1,670</b>	<b>0.04</b>	<b>0.044</b>	<b>6</b>	<b>n/a</b>	<b>n/a</b>	<b>96</b>			<b>\$8,000</b>	<b>3.8%</b>
<b>13 Good News Assembly of God Church</b>											
Downspout planter boxes	1,670	0.04	0.044	6	n/a	n/a	96	1000	box	\$8,000	3.8%
<b>Total Site Info</b>	<b>1,670</b>	<b>0.04</b>	<b>0.044</b>	<b>6</b>			<b>96</b>			<b>\$8,000</b>	<b>3.8%</b>



**Summary of Proposed Green Infrastructure Practices**

Subwatershed/Site Name/Total Site Info/GI Practice	Potential Management Area		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 %
	Area (SF)	Area (ac)									
<b>PARSONAGE RUN / FOSTER RUN SUBWATERSHED</b>	<b>53,326</b>	<b>1.22</b>	<b>1.389</b>	<b>232</b>	<b>133,277</b>	<b>4.98</b>	<b>18,583</b>			<b>\$222,995</b>	<b>6.8%</b>
<b>14 Buddhist Temple</b>											
Downspout planter boxes	405	0.01	0.011	1	n/a	n/a	24	1,000	box	\$2,000	0.9%
Pervious pavements	13,260	0.30	0.345	58	25,350	0.95	3,250	25	SF	\$81,250	28.7%
<b>Total Site Info</b>	<b>13,665</b>	<b>0.31</b>	<b>0.356</b>	<b>59</b>	<b>25,350</b>	<b>0.95</b>	<b>3,274</b>			<b>\$83,250</b>	<b>29.6%</b>
<b>15 Charles F. Seabrook School / Elizabeth F. Moore School</b>											
Bioretention systems	6,770	0.16	0.176	30	12,940	0.49	1,510	5	SF	\$7,550	1.8%
Downspout planter boxes	1,085	0.02	0.028	4	n/a	n/a	60	1000	box	\$5,000	0.3%
Rainwater harvesting systems	1,275	0.03	0.033	6	2,000	0.09	2,000	2	gal	\$4,000	0.3%
<b>Total Site Info</b>	<b>9,130</b>	<b>0.21</b>	<b>0.238</b>	<b>39</b>	<b>14,940</b>	<b>0.58</b>	<b>3,570</b>			<b>\$16,550</b>	<b>2.4%</b>
<b>16 Upper Deerfield Municipal Building &amp; Senior Center</b>											
Bioretention systems	2,455	0.06	0.064	11	4,690	0.18	650	5	SF	\$3,250	2.6%
Rainwater harvesting systems	1,065	0.02	0.028	5	2,000	0.08	2,000	2	gal	\$4,000	1.1%
<b>Total Site Info</b>	<b>3,520</b>	<b>0.08</b>	<b>0.092</b>	<b>15</b>	<b>6,690</b>	<b>0.26</b>	<b>2,650</b>			<b>\$7,250</b>	<b>3.7%</b>
<b>17 Upper Deerfield Township Public Works</b>											
Bioretention systems	3,500	0.08	0.091	15	5,535	0.18	930	5	SF	\$4,650	4.5%
Rainwater harvesting systems	2,930	0.07	0.076	13	4,638	0.15	2,300	2	gal	\$4,600	3.7%
<b>Total Site Info</b>	<b>6,430</b>	<b>0.15</b>	<b>0.168</b>	<b>28</b>	<b>10,173</b>	<b>0.33</b>	<b>3,230</b>			<b>\$9,250</b>	<b>8.2%</b>
<b>18 Woodruff Elementary School</b>											
Bioretention systems	5,606	0.13	0.146	24	21,124	0.79	1,989	5	SF	\$9,945	2.9%
Pervious pavements	14,975	0.34	0.390	65	55,000	2.07	3,870	25	SF	\$96,750	7.8%
<b>Total Site Info</b>	<b>20,581</b>	<b>0.47</b>	<b>0.536</b>	<b>90</b>	<b>76,124</b>	<b>2.86</b>	<b>5,859</b>			<b>\$106,695</b>	<b>10.7%</b>