Mendham Borough

Introduction

Located in Morris County in New Jersey, Mendham Borough covers about 6.0 square miles. With a population of 4,981 (2020 United States Census), Mendham Borough consists of 57.5% of urban land uses by area. Of that urban land use, approximately 51.8% is comprised of rural residential properties (NJDEP Open Data). In addition to residential development, urban land use also includes land used for commercial, recreational, and transportation purposes. Natural lands (forests, wetlands, and water) make up approximately 34.1% of Mendham Borough.

Mendham Borough contains portions of four subwatersheds (Table 1). There are approximately 17.0 miles of rivers and streams within the municipality; these include India Brook, Indian Grove Brook and its tributaries, McVickers Brook and its tributaries, North Branch Raritan River and its tributaries, Passaic River and its tributaries, and several uncoded tributaries. Mendham Borough is within the New Jersey Department of Environmental Protection (NJDEP) Watershed Management Areas (WMA) 6 (Upper Passaic, Whippany, and Rockaway) and 8 (North and South Branch Raritan).

Table 1: Subwatersheds of Mendham Borough

Subwatershed	HUC14
Passaic River Upper (above Osborn Mills)	02030103010010
Raritan River North Branch (above/including India Brook)	02030105060010
Raritan River North Branch (including McVickers to India Brook)	02030105060030
Raritan River North Branch (Peapack Brook to McVickers Brook)	02030105060040

The purpose of this report is to provide a comprehensive understanding of key, defining features within the subwatersheds throughout Mendham Borough. This involves gathering, organizing, and presenting information about existing conditions and infrastructure within each subwatershed. It aims to serve as a tool for informed decision-making, planning, and implementation of sustainable watershed management strategies aimed to protect and enhance the health of the watershed, its associated ecosystems, and the surrounding communities.

A geographic information system (GIS) was used to visualize data pertaining to the existing stormwater infrastructure, land cover, watershed delineation, and water quality classification and impairments within separate layers. Datasets from the New Jersey Department of Environmental Protection's (NJDEP's) GIS database was used to populate the watershed inventory map, from which the relevant data were isolated. Datasets representing Mendham Borough's existing

stormwater infrastructure were provided by the municipality and were manipulated, if necessary, for the specific purposes of this report.

Analysis by Municipality

An analysis was completed by municipality. Figure 1 shows Mendham Borough in relation to the study area. Figure 2 shows the portions of the four HUC14s in Mendham Borough and highlights the HUC14s that are contained within the study area. Figure 3 illustrates the land use in Mendham Borough. A detailed land use analysis and nonpoint source loading analysis was completed for each HUC14 in Mendham Borough and is presented in Table 2. Figure 4 shows the impervious cover in Mendham Borough based upon NJDEP's 2015 impervious cover layer. An impervious cover analysis was completed for each HUC14 in Mendham Borough and is presented in Table 3.

For the area of the municipality in the study area, a stormwater facilities analysis was completed (see Figure 5). Two sources were used to identify stormwater facilities. The first data source was the New Jersey Hydrologic Modeling Database (SCS, 2024) that was prepared by the Soil Conservation Districts (SCD) and Rutgers University. The second data source was the NJDEP 2020 land use/land cover GIS Layer. Land use data uses a land use code (1499) to identify stormwater basins. Each stormwater basin was inspected (see Table 4). The detention basins in Table 4 (identified as type "D") could benefit from naturalization (i.e., conversion from a detention basin to a bioretention basin). Detention basins that are already naturalized are identified as type "N". The retention basins in Table 4 (identified as type "R") could benefit from the addition of vegetative shoreline buffers. Retention basins that already have a vegetative shoreline buffer are listed as type "RB". No retention basins with or without vegetative shoreline buffers were identified in Mendham Borough within the study area.

The Q-Farms in Mendham Borough have been identified (see Figure 6). Table 5 presents the data available for each Q-Farm parcel. Q-Farms are the parcels that have been qualified for farmland tax assessment. The Q-Farms in the study area of Mendham Borough have been identified (see Figure 7 and Table 6). It is important to note that the land use on a Q-Farm is often not all agriculture. Figure 8 illustrates the land use on the Q-Farms, which is summarized in Table 7. There are 318.5 acres of agricultural land use in Mendham Borough, of which, 249.2 acres lie within the study area for this Watershed Restoration and Protection Plan. There are 52 Q-Farms and portions of seven Q-Farms in the study area portion of Mendham Borough, totaling 941.3 acres. Within the 52 Q-Farms and portions of seven Q-Farms, there are approximately 215.9 acres of agricultural land use. Aerial photography (see Figure 9) was used to identify areas where riparian buffers may be able to be enhanced to further protect the waterways from agricultural impacts. Based upon the aerial photograph and site visits, recommendations for the agricultural lands in the study area in Mendham Borough are presented in Table 8.

The impervious cover analysis was used to calculate targets for areas of rooftops to be treated with rain gardens and length of roadways to be managed with bioswales. Three HUC14s are included in the study area (02030105060010, 02030105060030, 02030105060040). Within these three HUC14s, there are 96.8 acres of buildings and 114.4 acres of roadway. The Watershed Restoration and Protection Plan recommends managing stormwater runoff from ¼ of 25% of the building rooftops. For the study area within Mendham Borough, approximately 6.1 acres of

rooftop runoff would be managed with 1.21 acres of rain gardens. The plan also calls for the management of 10% of the roadways with bioswales. For the study area within Mendham Borough, approximately 11.4 acres of roadway would be managed, or 3.1 miles of roadway.

Finally, the parcel data was used to identify parcels that are classified as Property Class 15. Property Class 15 parcels are tax-exempt, and include six subcategories:

15A – Public School Property

15B- Other School Property

15C- Public Property

15D- Church and Charitable Property

15E- Cemeteries and Graveyards

15F- Other Exempt

The Property Class 15 parcels for Mendham Borough are shown in Figure 10 and presented in Table 9. When the municipality develops their Watershed Improvement Plan to satisfy their Municipal Separate Storm Sewer System (MS4) permit, these are the first sites that are assessed for opportunities to install watershed improvement projects. This assessment was completed for the Property Class 15 parcels in the study area (see Figure 11). Available information for each parcel in the study area is presented in Table 10. Class 15E parcels were excluded from the assessment. Ten of these properties offer opportunities to be retrofitted with green infrastructure to help reduce pollutant loads. These properties are identified in Table 10 and represent watershed improvement projects that can be included in the municipality's Watershed Improvement Plan. Figure 12 shows parcels within the entire municipality that offer opportunities to be retrofitted with green infrastructure. These sites are included in the Impervious Cover Reduction Action Plan that was completed by the RCE Water Resources Program for the municipality.

Water Quality Classification

The New Jersey Department of Environmental Protection (NJDEP) Surface Water Quality Standards (SWQS) are regulations that govern the water quality goals and pollution limitations for surface waters in New Jersey. Surface waters are classified based on their designated uses, such as drinking water supply, aquatic life habitat, recreation, or shellfish harvesting. The SQWS are used to protect those uses and guide permitting, monitoring, and water quality restoration efforts.

Under the SWQS, freshwaters are classified as Fresh Water 1 (FW1), Fresh Water 2 (FW2), or Pinelands (PL). FW1 waters are nondegradation waters with unique ecological significance, in which man-made wastewater discharges are not permitted. FW2 waters are all other freshwaters except for Pinelands waters. FW2 waters are further classified based on their ability to support trout. Trout Production waters (TP) are designated for use by trout for spawning or nursery purposes during their first summer. Trout Maintenance waters (TM) are designated for the support of trout throughout the year. Nontrout waters (NT) are generally unsuitable for trout due to their physical, chemical, or biological characteristics. Pinelands waters – which may be either fresh or saline waters – are surface waters within the Pinelands Protection and Preservation areas.

Saline waters that are not PL are classified under the SWQS as either Saline Estuarine (SE) or Saline Coastal (SC). SE waters are further classified based on their ability to support recreation, shellfish harvesting, and warm water fish species. SE1 waters have the highest protection within the SE category, and must support the maintenance, migration, and propagation of fish and aquatic life, as well as shellfish harvesting. SE2 waters must support the maintenance, migration, and propagation of fish and aquatic life but do not need to support shellfish harvesting. SE3 waters must support the migration of fish but do not need to support permanent aquatic biota populations or shellfish harvesting. Some coastal waters have dual classifications where the waters change from freshwater to saltwater as they drain into the estuary or ocean.

Finally, there are three antidegradation classifications assigned to all New Jersey surface waters. Outstanding National Resource Waters (ONRW) is the most protective classification and applies to all F1 and PL waters. No degradation is permitted in ONRW waters. Category One waters (C1) are protected from any measurable change to existing water quality because of their exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, or exceptional fisheries resources. Category Two waters (C2) permit some measurable degradation in water quality, but the changes must be limited and justified. C2 is the default classification for all surface waters that are not categorized as F1, PL, or C1.

There are four classifications that apply to the streams in Mendham Borough. Figure 13 depicts the water quality classifications of surface waters throughout Mendham Borough and Table 11 summarizes the total miles and percentage of each surface water quality classification in the municipality.

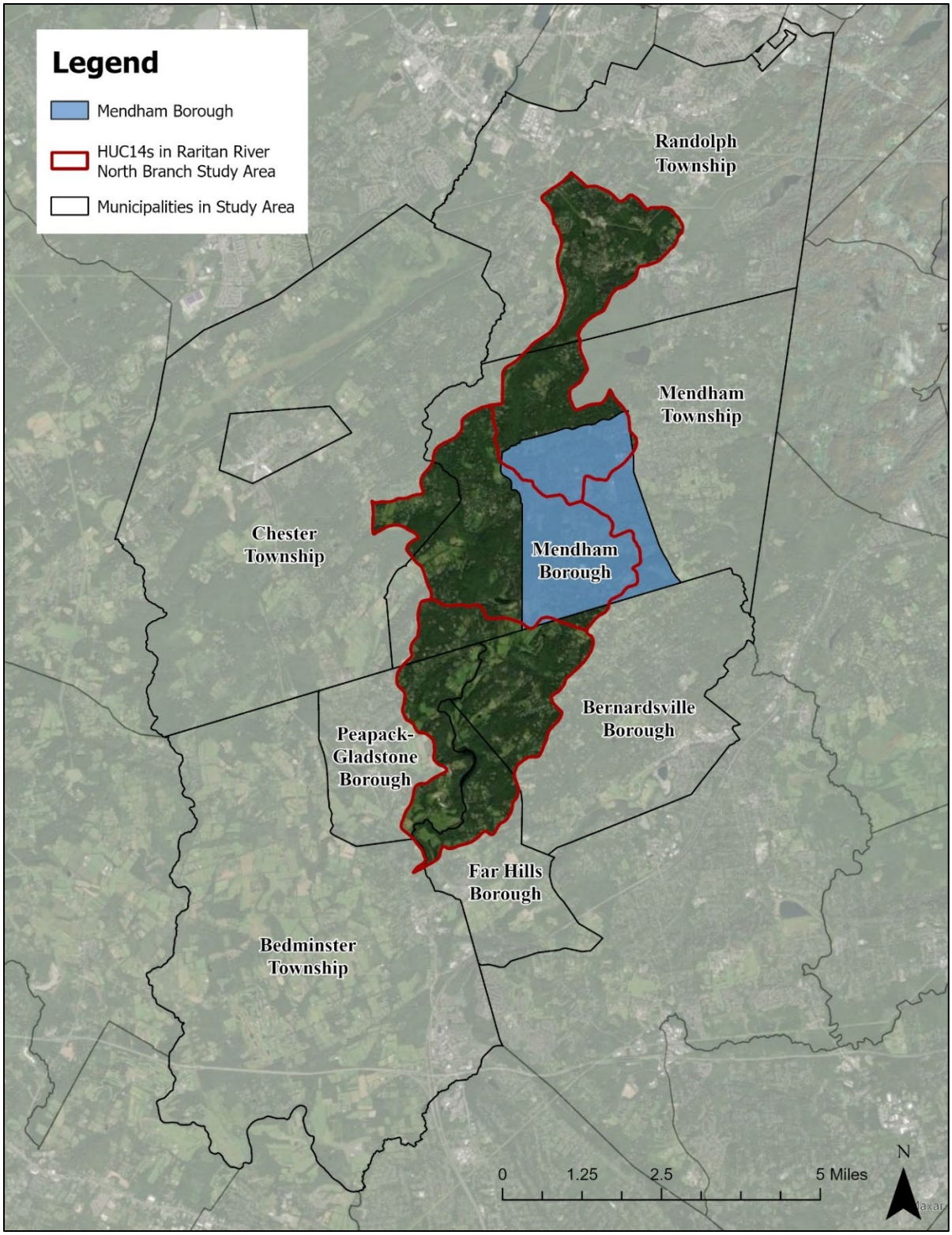

Figure 1: Municipalities in the Study Area

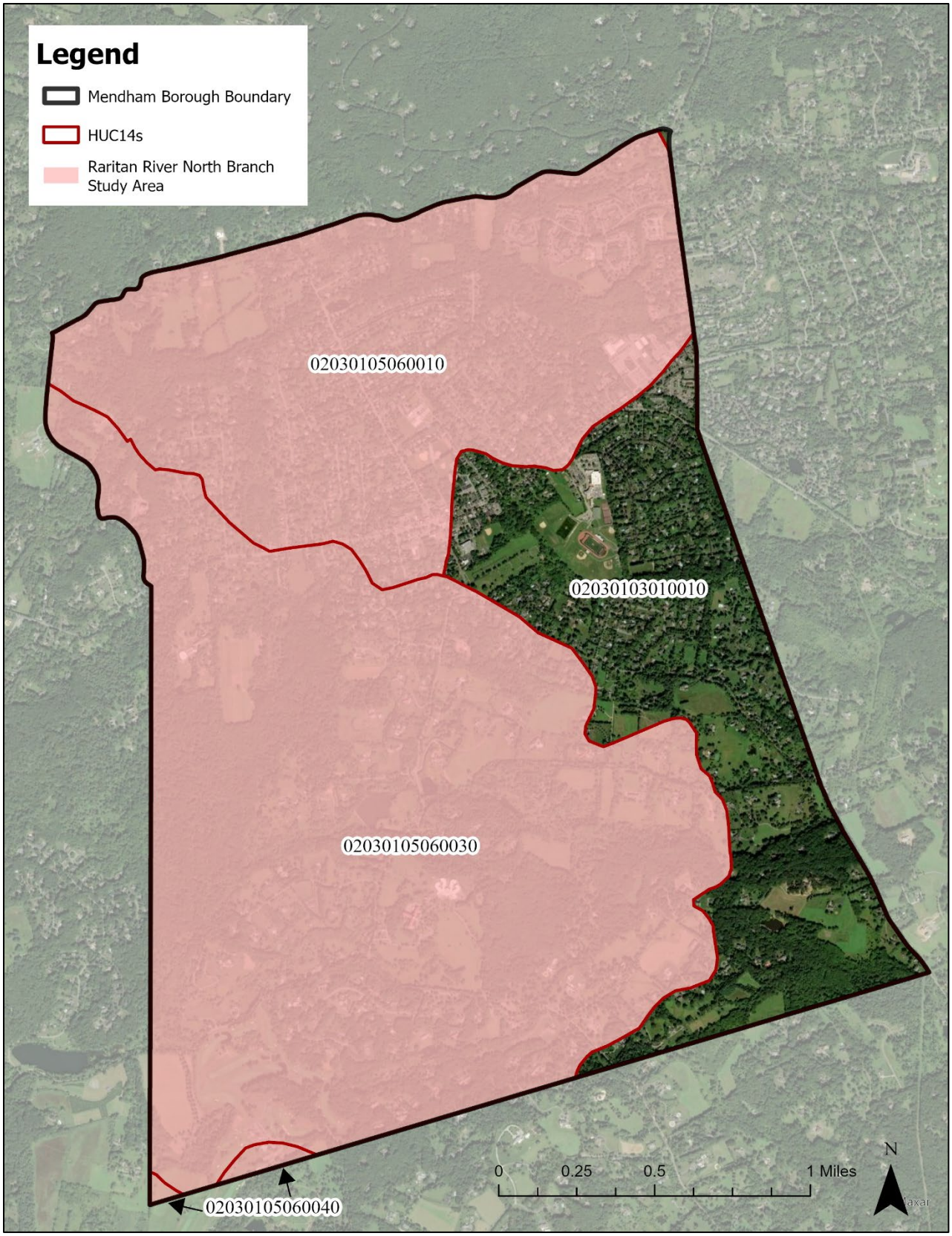

Figure 2: Portions of four HUC14s are in Mendham Borough

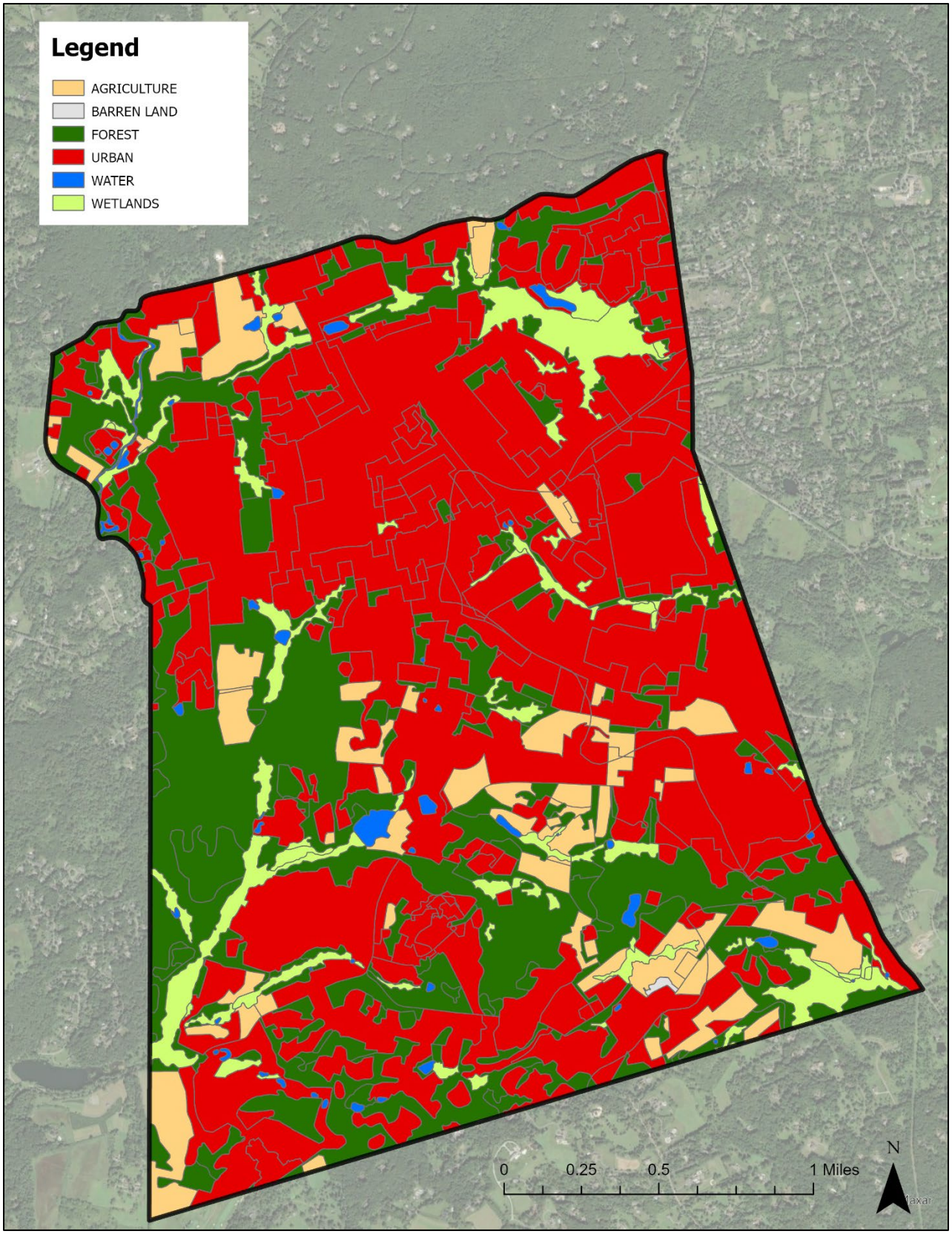

Figure 3: Land Use in Mendham Borough

Table 2: Land Use Analysis and Nonpoint Source Loading Analysis by HUC14 for Mendham Borough

Land Use Type	Area (acres)	TP Load (lbs/yr)	TN Load (lbs/yr)	TSS Load (lbs/yr)
02030103010010				
Agriculture	69.3	90.0	692.7	20,779.8
Barren Land	0.0	0.0	0.0	0.0
Forest	120.4	12.0	361.1	4,814.2
Urban	559.0	782.6	8,385.5	78,265.0
Water	2.8	0.3	8.3	110.8
Wetlands	49.9	5.0	149.6	1,995.1
TOTAL =	**801.3**	**890.0**	**9,597.2**	**105,964.8**
02030105060010				
Agriculture	51.2	66.5	511.8	15,354.3
Barren Land	0.0	0.0	0.1	0.7
Forest	162.1	16.2	486.2	6,482.7
Urban	759.0	1,062.7	11,385.7	106,266.7
Water	9.5	1.0	28.6	381.0
Wetlands	95.2	9.5	285.6	3,807.7
TOTAL =	**1,077.0**	**1,155.9**	**12,697.9**	**132,293.1**
02030105060030				
Agriculture	194.0	252.3	1,940.4	58,212.0
Barren Land	1.9	0.9	9.4	112.3
Forest	732.8	73.3	2,198.5	29,312.9
Urban	871.8	1,220.5	13,076.5	122,047.0
Water	23.2	2.3	69.5	926.3
Wetlands	107.6	10.8	322.8	4,304.1
TOTAL =	**1,931.3**	**1,560.0**	**17,617.0**	**214,914.6**
02030105060040				
Agriculture	4.0	5.3	40.4	1,213.4
Barren Land	0.0	0.0	0.0	0.0
Forest	1.3	0.1	4.0	53.3
Urban	10.6	14.8	158.8	1,481.7
Water	0.0	0.0	0.0	0.0
Wetlands	0.0	0.0	0.0	0.0
TOTAL =	**16.0**	**20.2**	**203.2**	**2,748.5**
All HUCs				
Agriculture	318.5	414.1	3,185.3	95,559.5
Barren Land	1.9	0.9	9.4	113.1
Forest	1,016.6	101.7	3,049.7	40,663.1
Urban	2,200.4	3,080.6	33,006.5	308,060.4
Water	35.5	3.5	106.4	1,418.0
Wetlands	252.7	25.3	758.0	10,106.9

TOTAL =	**3,825.5**	**3,626.1**	**40,115.3**	**455,921.1**

Impervious Cover Analysis

NJDEP's Open Data impervious surface GIS data layer depicts surfaces throughout Mendham Borough that have been covered with materials that are highly resistant to infiltration by water, rendering them impervious. These surfaces include rooftops, roadways, sidewalks, and other paved areas. These impervious cover values were used to estimate the impervious coverage for Mendham Borough. Based upon the NJDEP impervious surface data, Mendham Borough has impervious cover totaling 14.7%. Table 3 shows impervious cover for each HUC14. The extent of the impervious cover in Mendham Borough is shown in Figure 4.

The literature suggests a link between impervious cover and stream ecosystem impairment (Schueler, 1994; Arnold and Gibbons, 1996; May et al., 1997). Impervious cover may be linked to the quality of lakes, reservoirs, estuaries, and aquifers (Caraco et al., 1998), and the amount of impervious cover in a watershed can be used to project the current and future quality of streams. Based on scientific literature, Caraco et al. (1998) classified urbanizing streams into the following three categories: sensitive streams, impacted streams, and non-supporting streams.

Schueler (1994, 2004) developed an impervious cover model that classified "sensitive streams" as typically having a watershed impervious surface cover from 0-10%. "Impacted streams" have a watershed impervious cover ranging from 11-25% and typically show clear signs of degradation from urbanization. "Non-supporting streams" have a watershed impervious cover of greater than 25%; at this high level of impervious cover, streams are simply conduits for stormwater flow and no longer support a diverse stream community.

Schueler et al. (2009) reformulated the impervious cover model based upon new research that had been conducted. This analysis determined that stream degradation was first detected at 2 to 15% impervious cover. The updated impervious cover model recognizes the wide variability of stream degradation at impervious cover below 10%. The updated model also moves away from having a fixed line between stream quality classifications. For example, 5 to 10% impervious cover is included for the transition from sensitive to impacted, 20 to 25% impervious cover for the transition between impacted and non-supporting, and 60 to 70% impervious cover for the transition from non-supporting to urban drainage.

Based upon this information, Mendham Borough's impervious cover percentage would suggest that its waterways are primarily impacted and most likely contributing to not meeting the state's surface water quality standards.

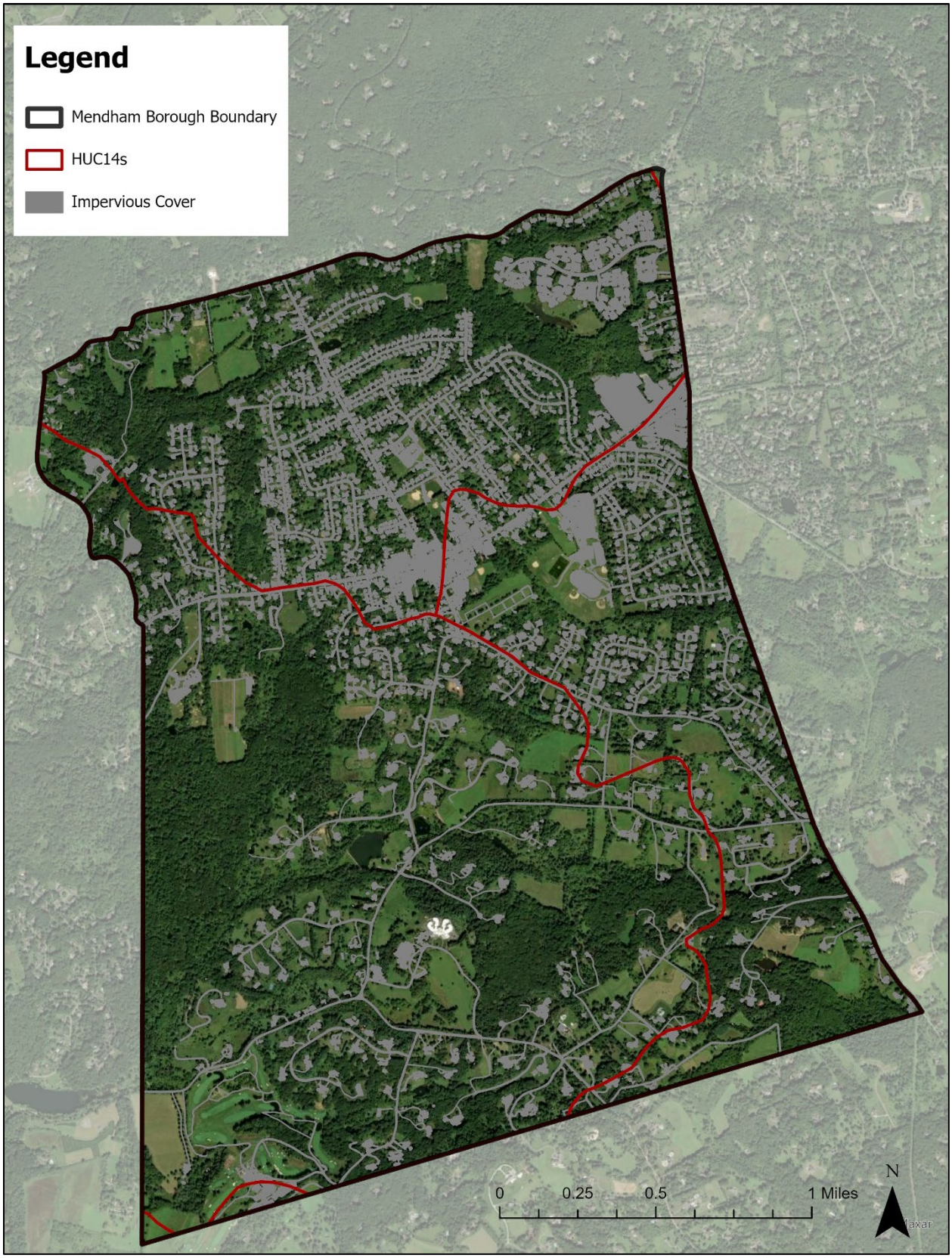

Figure 4: Impervious Cover in Mendham Borough

Table 3: Impervious Cover Analysis by HUC14 for Mendham Borough

Class	Area (acres)	HUC Impervious Cover (%)
02030103010010		
Building	32.48	
Other	76.58	
Road	40.77	
TOTAL =	**149.8**	**18.7%**
02030105060010		
Building	63.64	
Other	116.61	
Road	62.51	
TOTAL =	**242.8**	**22.5%**
02030105060030		
Building	32.74	
Other	82.16	
Road	51.90	
TOTAL =	**166.8**	**8.6%**
02030105060040		
Building	0.43	
Other	3.78	
Road	0.00	
TOTAL =	**4.2**	**26.3%**
All HUCs		
Building	129.29	
Other	279.13	
Road	155.18	
TOTAL =	**563.6**	**14.7%**

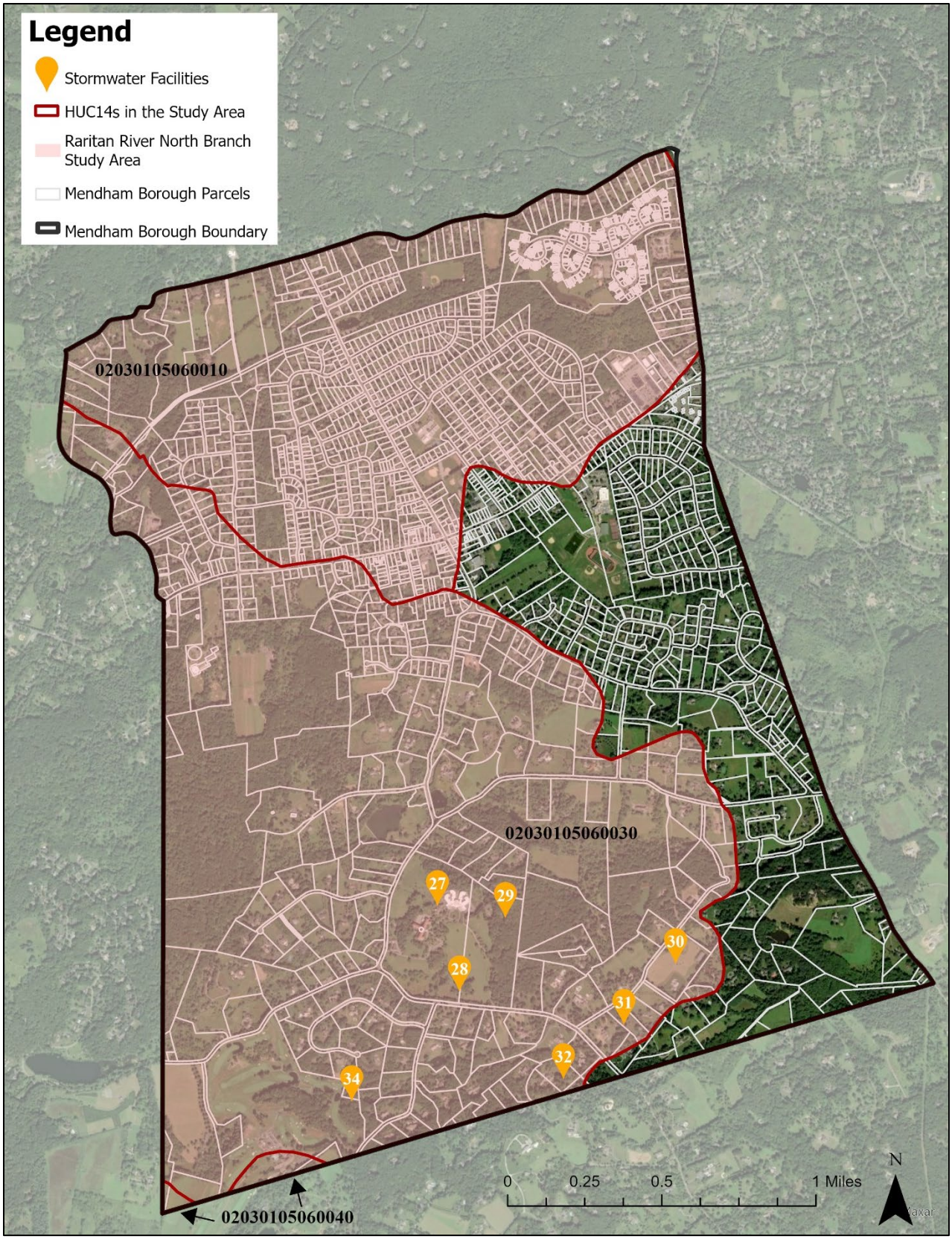

Figure 5: Stormwater Facilities in the Study Area of Mendham Borough

Table 4: Location of Stormwater Facilities in the Study Area of Mendham Borough

Raritan River North Branch Study Area		
ID	**Address**	**Type**
27	350 Bernardsville Rd	D
28	350 Bernardsville Rd	D
29	350 Bernardsville Rd	D
30*	20 Horseshoe Bend Rd	I/U
31	Horseshoe Bend Ln	D
32	51 Horseshoe Bend Rd	D
34	31 Balbrook Dr	N

"D" = Detention, "N" = Naturalized, "I" = Infiltration, "U" = Underground

*Unable to locate basin in the field. According to the New Jersey Hydrologic Modeling Database, basin is an underground infiltration basin.

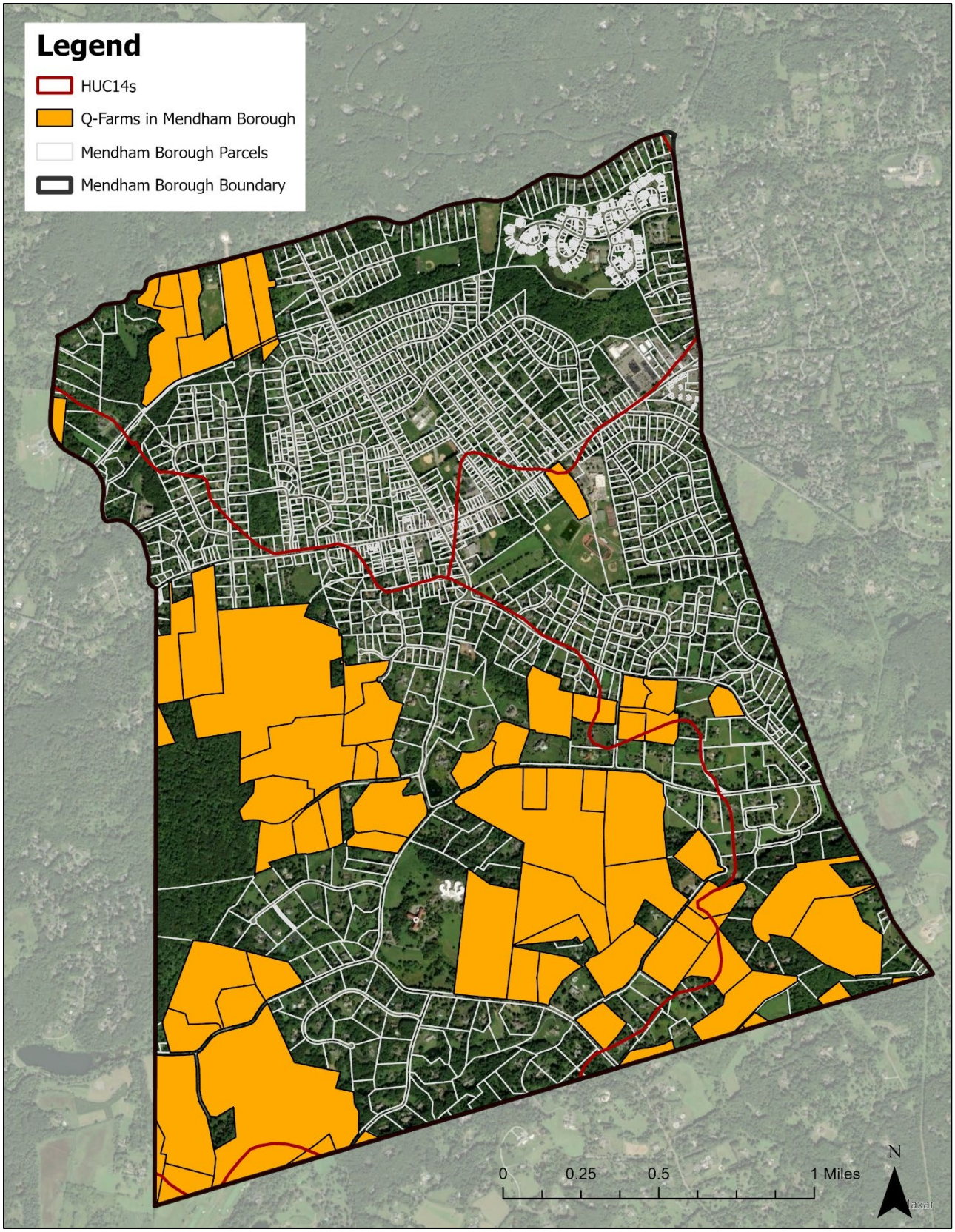

Figure 6: Q-Farm Parcels in Mendham Borough

Table 5: Q-Farm Parcels in Mendham Borough

Block	Lot	Q-Code	Prop Class	Location
7	4.06	Q0082	3B	8 Preserve Lane
101	13	QFARM	3B	210 Mountainside Rd
101	14	QFARM	3B	220 Mountainside Rd
101	16	QFARM	3B	226 Mountainside Rd
101	17	QFARM	3B	240 Mountainside Rd
101	18	QFARM	3B	250 Mountainside Rd
101	19	QFARM	3B	260 Mountainside Rd
101	30	QFARM	3B	127 Ironia Rd
102	5	QFARM	3B	Mountainside Rd
102	6	QFARM	3B	Mountainside Rd
201	63	QFARM	3B	Mountainside Rd
1401	7	QFARM	3B	63 E. Main St
1801	5	QFARM	3B	80-88 West Main St
1801	5.01	QFARM	3B	W Main St
1801	16	QFARM	3B	W Main St
1801	36.02	QFARM	3B	3 Spring Meadow Ln
1801	36.03	QFARM	3B	4 Thomas Rd
1801	36.04	QFARM	3B	Spring Meadow Ln
1801	36.05	QFARM	3B	2 Thomas Rd
1801	37	QFARM	3B	Thomas Rd
1801	38	QFARM	3B	298 Thomas Rd
1801	39	QFARM	3B	W Main St
2001	1.02	QFARM	3B	3 Charolais Farm Rd
2001	1.05	QFARM	3B	6 Charolais Farm Rd
2001	1.07	QFARM	3B	5 Charolais Farm Rd
2001	23.02	QFARM	3B	35 Prentice Ln
2101	1.03	QFARM	3B	44 Prentice Ln
2101	1.11	QFARM	3B	48 Prentice Ln
2101	4.02	QFARM	3B	147 Talmage Rd
2101	5	QFARM	3B	135 Talmage Rd
2101	5.01	QFARM	3B	135 Talmage Rd
2201	3	QFARM	3B	Thomas Rd
2201	4	QFARM	3B	230 Thomas Rd
2201	4.02	QFARM	3B	220 Thomas Rd
2201	5	QFARM	3B	275 Hilltop Rd
2201	7	QFARM	3B	291 Hilltop Rd
2201	19	QFARM	3B	279 Pleasant Valley Rd
2201	19.02	QFARM	3B	95 Pleasant Valley Rd
2201	19.04	QFARM	3B	Pleasant Valley Rd
2201	19.05	QFARM	3B	243 Pleasant Valley Rd
2301	2.01	QFARM	3B	175-179 Cherry Ln

2301	2.02	QFARM	3B	175-179 Cherry Ln
2301	2.03	QFARM	3B	175-179 Cherry Ln
2301	3	QFARM	3B	375 Cherry Ln
2301	4.01	QFARM	3B	7 Horseshoe Bend Rd
2301	4.03	QFARM	3B	3 Horseshoe Bend Rd
2301	5	QFARM	3B	11 Horseshoe Bend Rd
2301	6	QFARM	3B	15 Horseshoe Bend Ln
2301	7	QFARM	3B	8 Horseshoe Bend Ln
2301	11	QFARM	3B	460 Bernardsville Rd
2301	12	QFARM	3B	440 Bernardsville Rd
2301	13	QFARM	3B	350 Bernardsville Rd
2401	2	QFARM	3B	1 County Line Rd
2401	5	QFARM	3B	9 County Line Rd
2401	6.01	QFARM	3B	10 Horseshoe Bend Rd
2401	7	QFARM	3B	Bernardsville Rd
2401	8	QFARM	3B	Nichols Rd
2401	9.01	QFARM	3B	Washington Corner Rd
2401	9.03	QFARM	3B	Washington Corner Rd
2401	31	QFARM	3B	2 Oak Forest Ln
2401	31.06	QFARM	3B	99 Hardscrabble Rd
2401	31.07	QFARM	3B	6 Horseshoe Bend Rd
2401	31.08	QFARM	3B	8 Horseshoe Bend Rd
2401	32	QFARM	3B	16 Horseshoe Bend Rd
2401	36	QFARM	3B	500 Bernardsville Rd
2501	1	QFARM	3B	Bliss Rd
2601	3	QFARM	3B	179 Bliss Rd
2601	4	QFARM	3B	Bliss Rd
2601	5	QFARM	3B	Pleasant Valley Rd
2601	6	QFARM	3B	Pleasant Valley Rd
2601	7	QFARM	3B	290 Pleasant Valley Rd

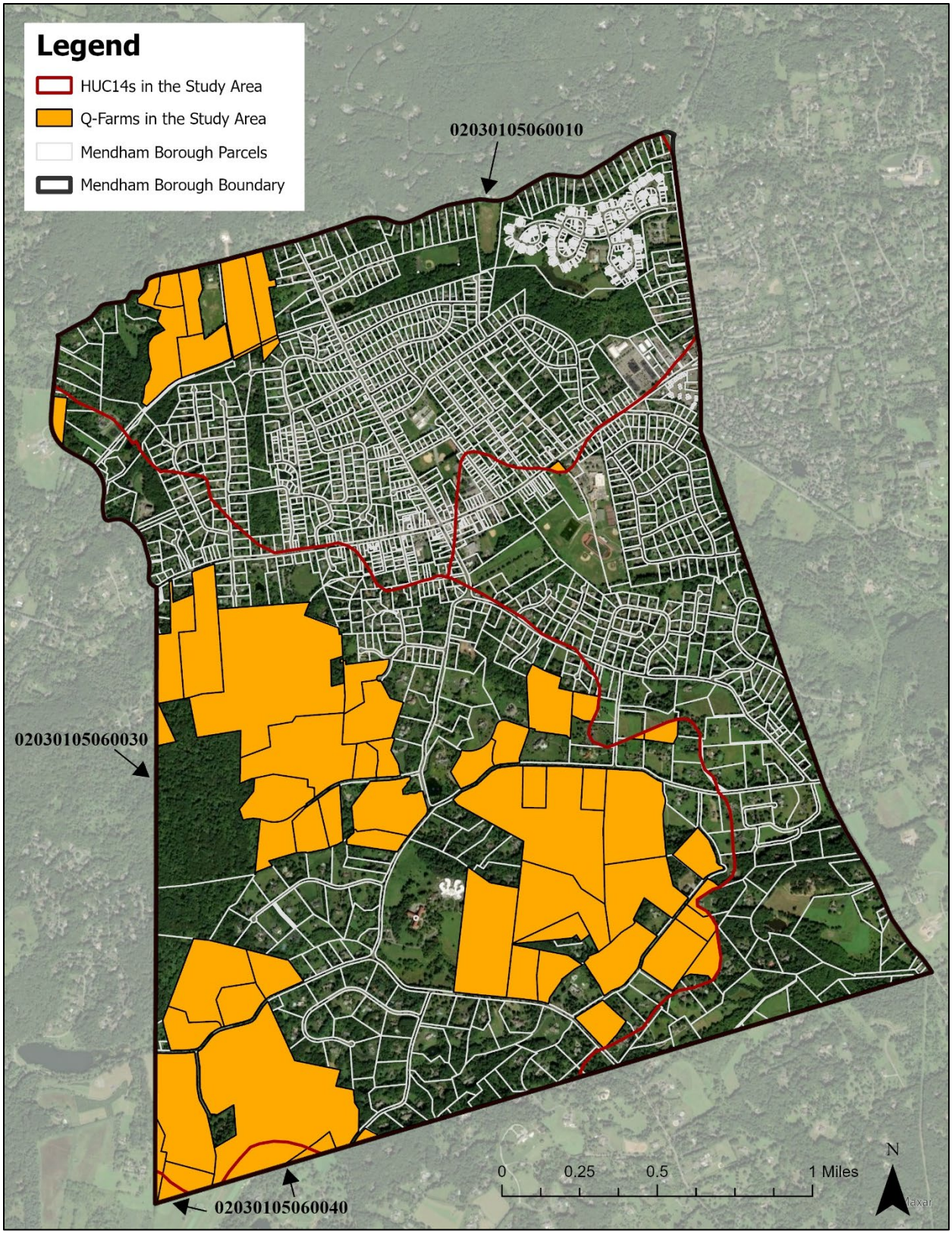

Figure 7: Q-Farm Parcels in the Study Area of Mendham Borough

Table 6: Q-Farm Parcels in the Study Area of Mendham Borough

Block	Lot	Q-Code	Prop Class	Location
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101	17	QFARM	3B	240 Mountainside Rd
101	18	QFARM	3B	250 Mountainside Rd
101	19	QFARM	3B	260 Mountainside Rd
101	30	QFARM	3B	127 Ironia Rd
102	5	QFARM	3B	Mountainside Rd
102	6	QFARM	3B	Mountainside Rd
201	63	QFARM	3B	Mountainside Rd
*1401	7	QFARM	3B	63 E. Main St
1801	5	QFARM	3B	80-88 West Main St
1801	5.01	QFARM	3B	W Main St
1801	16	QFARM	3B	W Main St
1801	36.02	QFARM	3B	3 Spring Meadow Ln
1801	36.03	QFARM	3B	4 Thomas Rd
1801	36.04	QFARM	3B	Spring Meadow Ln
1801	36.05	QFARM	3B	2 Thomas Rd
1801	37	QFARM	3B	Thomas Rd
1801	38	QFARM	3B	298 Thomas Rd
1801	39	QFARM	3B	W Main St
2001	1.02	QFARM	3B	3 Charolais Farm Rd
2001	1.05	QFARM	3B	6 Charolais Farm Rd
2001	1.07	QFARM	3B	5 Charolais Farm Rd
*2001	23.02	QFARM	3B	35 Prentice Ln
*2101	1.03	QFARM	3B	44 Prentice Ln
*2101	1.11	QFARM	3B	48 Prentice Ln
2201	3	QFARM	3B	Thomas Rd
2201	4	QFARM	3B	230 Thomas Rd
2201	4.02	QFARM	3B	220 Thomas Rd
2201	5	QFARM	3B	275 Hilltop Rd
2201	7	QFARM	3B	291 Hilltop Rd
2201	19	QFARM	3B	279 Pleasant Valley Rd
2201	19.02	QFARM	3B	95 Pleasant Valley Rd
2201	19.04	QFARM	3B	Pleasant Valley Rd
2201	19.05	QFARM	3B	243 Pleasant Valley Rd
2301	2.01	QFARM	3B	175-179 Cherry Ln
2301	2.02	QFARM	3B	175-179 Cherry Ln
2301	2.03	QFARM	3B	175-179 Cherry Ln
2301	3	QFARM	3B	375 Cherry Ln
2301	4.01	QFARM	3B	7 Horseshoe Bend Rd

2301	4.03	QFARM	3B	3 Horseshoe Bend Rd
2301	5	QFARM	3B	11 Horseshoe Bend Rd
2301	6	QFARM	3B	15 Horseshoe Bend Ln
2301	7	QFARM	3B	8 Horseshoe Bend Ln
2301	11	QFARM	3B	460 Bernardsville Rd
2301	12	QFARM	3B	440 Bernardsville Rd
2301	13	QFARM	3B	350 Bernardsville Rd
*2401	6.01	QFARM	3B	10 Horseshoe Bend Rd
*2401	31.07	QFARM	3B	6 Horseshoe Bend Rd
*2401	31.08	QFARM	3B	8 Horseshoe Bend Rd
2401	32	QFARM	3B	16 Horseshoe Bend Rd
2401	36	QFARM	3B	500 Bernardsville Rd
2501	1	QFARM	3B	Bliss Rd
2601	3	QFARM	3B	179 Bliss Rd
2601	4	QFARM	3B	Bliss Rd
2601	5	QFARM	3B	Pleasant Valley Rd
2601	6	QFARM	3B	Pleasant Valley Rd
2601	7	QFARM	3B	290 Pleasant Valley Rd

*Only a portion of the parcel is within the study area

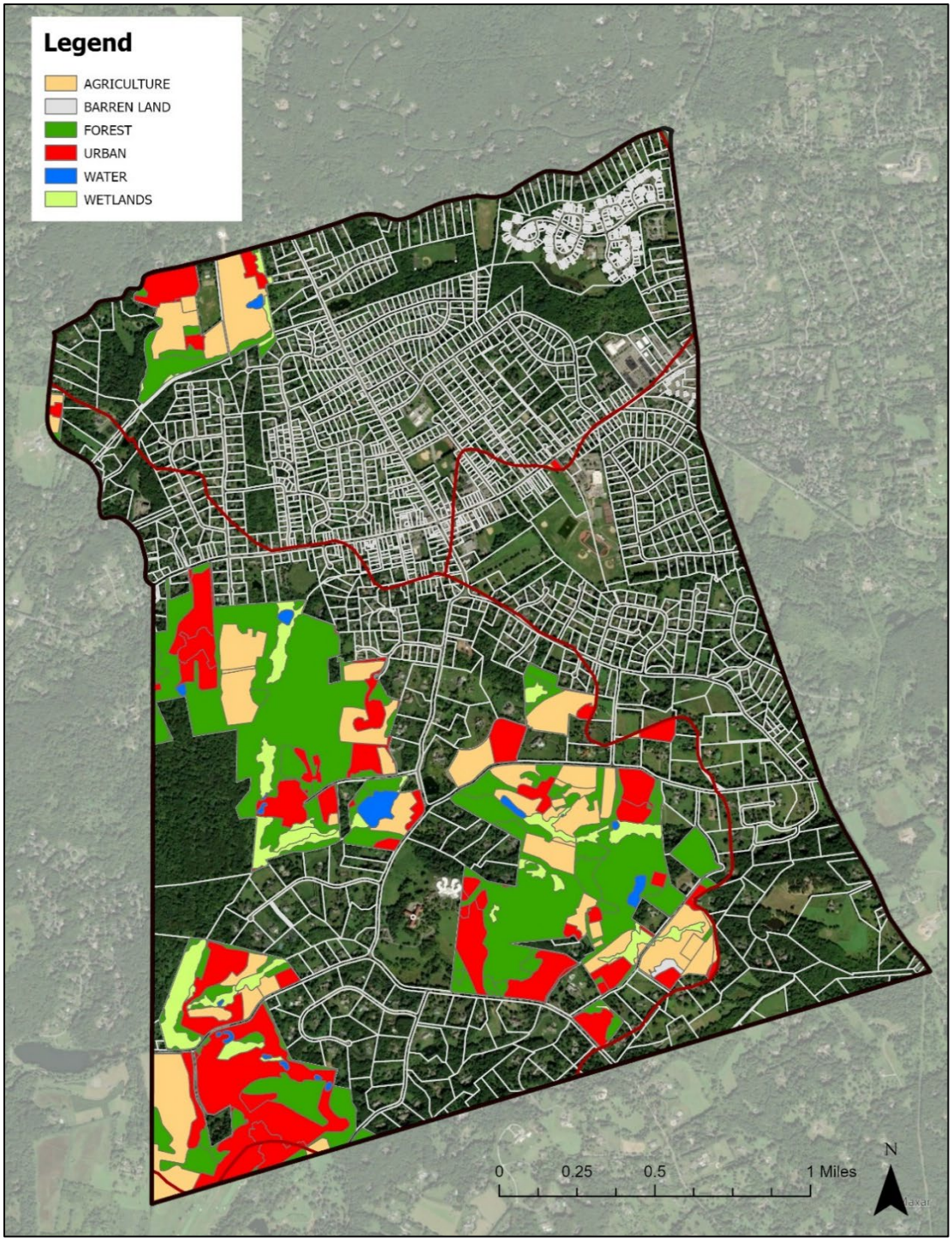


Figure 8: Land Use on Q-Farm Parcels in the Study Area of Mendham Borough

Table 7: Land Use on Q-Farms in the Study Area of Mendham Borough

Land Use	Area (acres)
Agriculture	215.9

Barren Land	1.7
Forest	381.4
Urban	255.9
Water	15.3
Wetlands	71.0
Total:	**941.3**

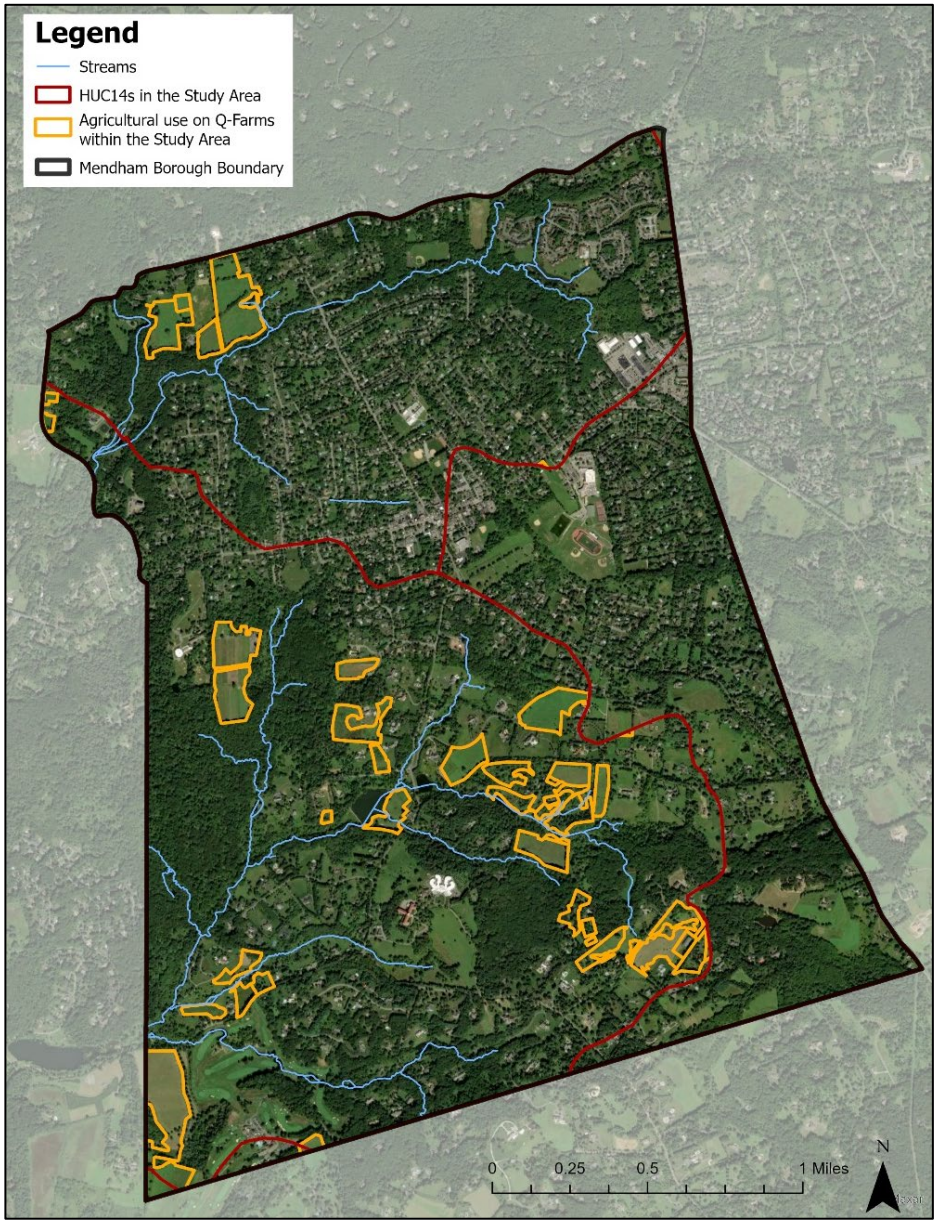


Figure 9: Aerial View of Agricultural Use on Q-Farm Parcels within the Study Area of Mendham Borough

Table 8: Recommendations for Specific Farms in the Study Area of Mendham Borough

North Branch Raritan River Study Area								
Block	**Lot**	**Q-Farm Code**	**Cover Crop**	**Enhanced Stream Buffer**	**Impervious Cover Mgt.**	**Rainwater Harvesting**	**Livestock Exclusion**	**Manure Mgt.**
101	13	QFARM				X		X
101	14	QFARM						X
101	19	QFARM				X		X

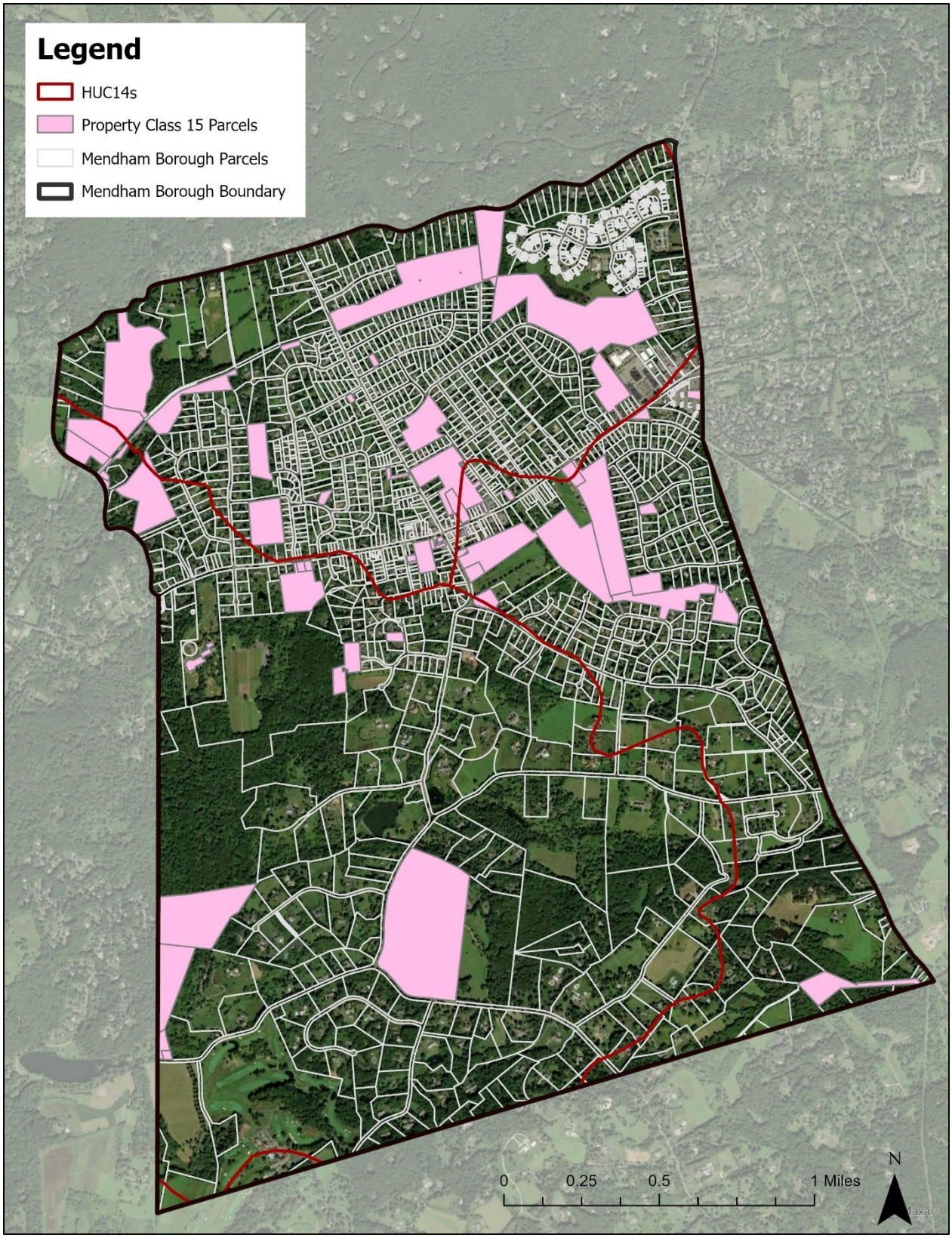


Figure 10: Property Class 15 Parcels in Mendham Borough

Table 9: Property Class 15 Parcels in Mendham Borough

Block	Lot	Prop Class	Location	Facility Type
203	79	15A	Aster Ter	Vacant Land
601	16	15A	8 Orchard St	Coop Nursey School
703	16	15A	100 Dean Rd	Schools
1401	8	15A	65-1/2 E Main St	Schools
1401	9	15A	E Main St	School & Field House
1501	9.01	15A	E Main St R.O.W.	Schools
1501	35	15A	12 Hilltop Rd	Schools
101	21	15C	Mountainside Rd	Vacant Land
101	31	15C	Ironia Rd	Sewerage Disposal
101	32	15C	Ironia Rd	Park
102	1	15C	Old Railroad Bed	Sewerage
201	1	15C	Ironia Rd	Sewerage Disposal
201	2	15C	Ironia Rd	Park
201	3	15C	Ironia Rd	Park
201	5	15C	Ironia Rd	Park
201	6	15C	Ironia Rd	Incinerator
201	42	15C	Mountainside Rd	Park
201	70	15C	North Linden Ln	Park
301	22	15C	4 Wilson St	Community Center
404	18	15C	Maple Ave	Park
501	23	15C	88 Mountainside Rd	Recreation Fields
501	43	15C	Mountainside Rd	Park
501	43.01	15C	Mountainside Rd	Well / Pump Hse
501	43.01	15C	Mountainside Rd	Well / Pump Hse
501	44	15C	Dean Rd	Park
601	11	15C	24 E Main St	Fire House
602	3.02	15C	34b East Main St	Park
801	25	15C	A1-D8 Heritage Manor Dr	Senior Housing
1401	37	15C	Coventry Rd	Park
1403	1	15C	Cold Hill Rd & E Main St	Park
1707	3	15C	Franklin Rd	Park
1801	16.02	15C	W Main St	Recreation Park
1801	16.03	15C	W Main St	Recreation Park
1801	16.04	15C	W Main St	Recreation Park
1801	19	15C	Heather Hill Way	Park
1801	38.01	15C	Thomas Rd	Park
1902	24	15C	2 W Main St	Boro Hall
1902	26	15C	6 W Main St	Administrative Bldg.
2701	1	15C	2 Tempe Wick Rd	Post Office
2701	4	15C	3 Cold Hill Rd	Police Station
303	3	15D	13 Country Ln	Parsonage
601	5	15D	10 E Main St	Church
1401	68	15D	65 E Main St	Church
1501	4	15D	7 E Main St	Church
1501	31	15D	20 Hilltop Rd	Church
1501	34	15D	16 Hilltop Rd	Parsonage

1801	5	15D	80-88 West Main St	Schools
1902	3	15D	4 New St	Parsonage
1902	4	15D	6 New St	Parish House
1902	27	15D	8 W Main St	Church
2301	13	15D	350 Bernardsville Rd	Schools
2701	5	15D	5 Cold Hill Rd South, 10c	Office Bldg.
301	19	15F	20 Mountain Ave	Disabled Veteran
402	3	15F	4 Garabrant St	Disabled Veteran
902	16	15F	10 Phoenix Dr	Disabled Veteran
1401	64	15F	27 Lowery Ln	Disabled Veteran
1501	37	15F	10 Hilltop Rd	Library
1705	1	15F	8 Leddell Rd	Disabled Veteran
1801	38.01	15F	Thomas Rd	Park
1901	22	15F	4 Muirfield Ln	Disabled Veteran
1902	1	15F	14 W Main St	Administrative Bldg.
1902	22	15F	3 Hilltop Rd	Club
2201	19.01	15F	Pleasant Valley Rd	Conservation Easemnt
2201	19.03	15F	Pleasant Valley Rd	Recreational Park
2201	21	15F	329 Pleasant Valley Rd	Dedicated Open Space
2201	22	15F	Pleasant Valley Rd	Conservation Easemnt
2401	9.04	15F	Washington Corner Rd	Dedicated Open Space

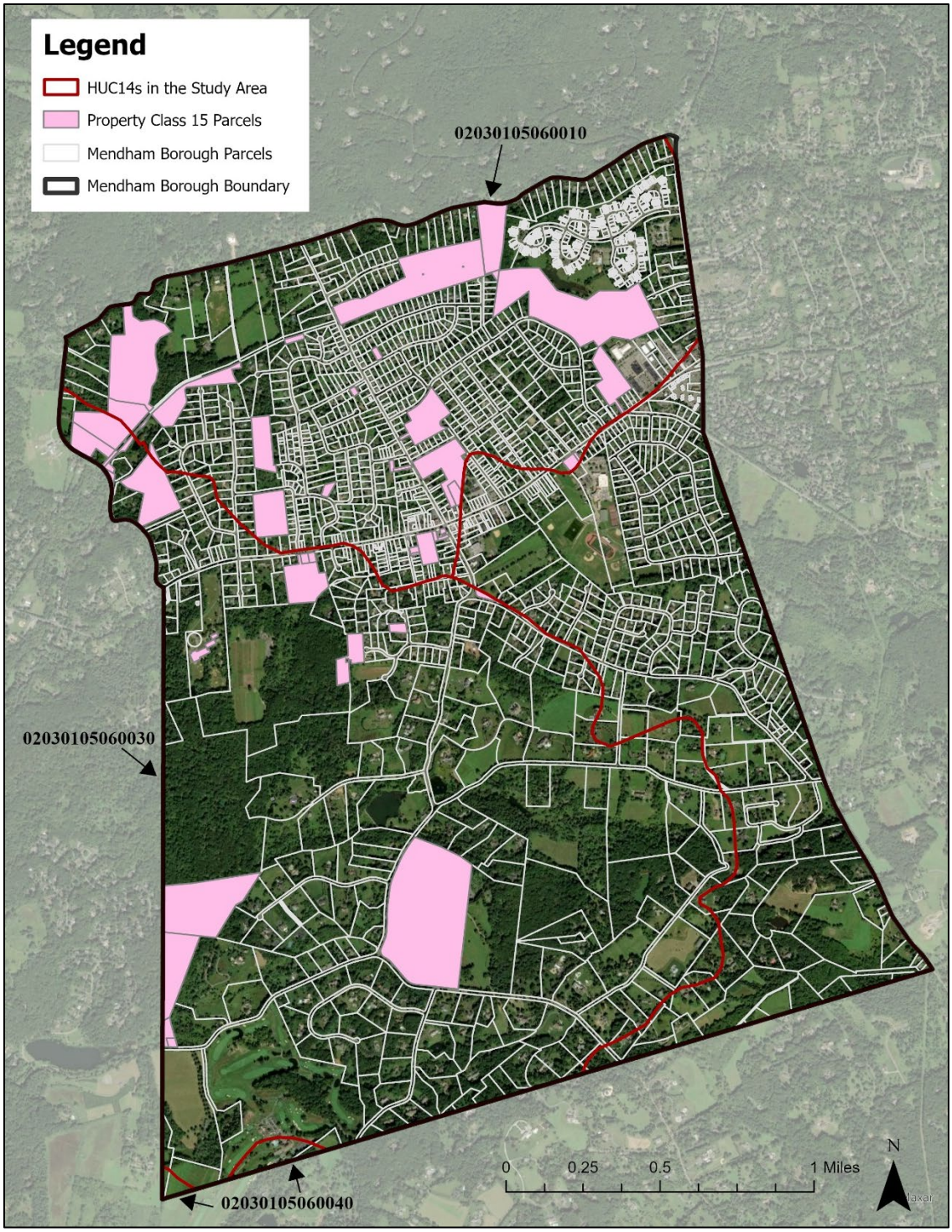


Figure 11: Property Class 15 parcels in the Study Area of Mendham Borough

Table 10: Property Class 15 Parcels in the Study Area of Mendham Borough

Block	Lot	Prop Class	Location	Facility Type
203	79	15A	Aster Ter	Vacant Land
***601**[1]	**16**	**15A**	**8 Orchard St**	**Coop Nursey School**

703	16	15A	100 Dean Rd	Schools
***1401[1]**	**8**	**15A**	**65-1/2 E Main St**	**Schools**
101	21	15C	Mountainside Rd	Vacant Land
101	31	15C	Ironia Rd	Sewerage Disposal
101	32	15C	Ironia Rd	Park
102	1	15C	Old Railroad Bed	Sewerage
201	1	15C	Ironia Rd	Sewerage Disposal
201	2	15C	Ironia Rd	Park
201	3	15C	Ironia Rd	Park
201	5	15C	Ironia Rd	Park
***201**	**6**	**15C**	**Ironia Rd**	**Public Works**
201	42	15C	Mountainside Rd	Park
201	70	15C	North Linden Ln	Park
301	22	15C	4 Wilson St	Community Center
404	18	15C	Maple Ave	Park
501	23	15C	88 Mountainside Rd	Recreation Fields
501	43	15C	Mountainside Rd	Park
501	43.01	15C	Mountainside Rd	Well / Pump Hse
501	43.01	15C	Mountainside Rd	Well / Pump Hse
501	44	15C	Dean Rd	Park
801	25	15C	A1-D8 Heritage Manor Dr	Senior Housing
1801	16.02	15C	W Main St	Recreation Park
1801	16.03	15C	W Main St	Recreation Park
1801	16.04	15C	W Main St	Recreation Park
1801	19	15C	Heather Hill Way	Park
1801	38.01	15C	Thomas Rd	Park
***1902**	**24**	**15C**	**2 W Main St**	**Boro Hall**
1902	26	15C	6 W Main St	Administrative Bldg.
303	3	15D	13 Country Ln	Parsonage
***601[1]**	**5**	**15D**	**10 E Main St**	**Church**
***1401[1]**	**68**	**15D**	**65 E Main St**	**Church**
***1501[1]**	**31**	**15D**	**20 Hilltop Rd**	**Church**
***1801**	**5**	**15D**	**80-88 West Main St**	**Schools**
***1902[2]**	**3**	**15D**	**4 New St**	**Parsonage**
***1902[2]**	**4**	**15D**	**6 New St**	**Parish House**
***1902[2]**	**27**	**15D**	**8 W Main St**	**Church**
2301	13	15D	350 Bernardsville Rd	Schools
301	19	15F	20 Mountain Ave	Disabled Veteran
402	3	15F	4 Garabrant St	Disabled Veteran
902	16	15F	10 Phoenix Dr	Disabled Veteran
***1501[1]**	**37**	**15F**	**10 Hilltop Rd**	**Library**
1801	38.01	15F	Thomas Rd	Park
1901	22	15F	4 Muirfield Ln	Disabled Veteran
1902	1	15F	14 W Main St	Administrative Bldg.
1902	22	15F	3 Hilltop Rd	Club
2201	19.01	15F	Pleasant Valley Rd	Conservation Easemnt
2201	19.03	15F	Pleasant Valley Rd	Recreational Park
2201	21	15F	329 Pleasant Valley Rd	Dedicated Open Space
2201	22	15F	Pleasant Valley Rd	Conservation Easemnt

***Sites that can be retrofitted with green infrastructure**

[1] Only a portion of the site is within the study area
[2] Site includes three tax-exempt parcels

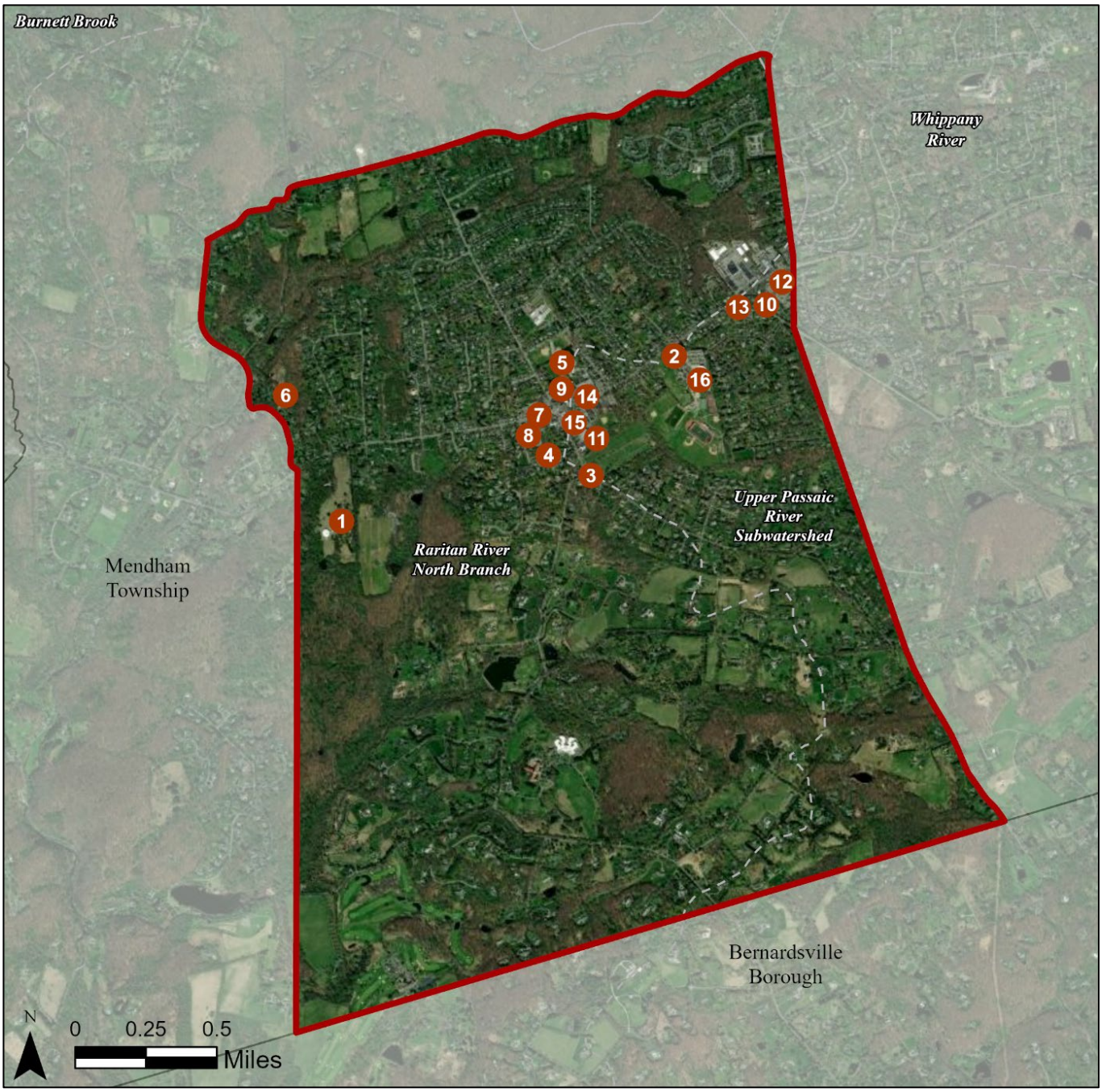


Figure 12: Sites with Green Infrastructure Opportunities in Mendham Borough

DAYTOP PREPARATORY SCHOOL

RAP ID: 1

Subwatershed: Raritan River North Branch

Site Area: 1,167,548 sq. ft.

Address: 80 West Main Street
Mendham, NJ 07945

Block and Lot: Block 1801, Lot 5

A rain garden can be installed to capture, treat, and filter runoff from the rooftop of the easternmost building on the property. Pervious pavement can be installed in the parking spaces to infiltrate the water from the driveway, and downspout planter boxes can be installed along the front of the school. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
17	193,923	9.3	97.9	890.4	0.151	5.32

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	0.036	6	2,680	0.10	350	$1,750
Pervious pavement	0.236	40	17,340	0.65	1,620	$40,500
Planter boxes	n/a	6	n/a	n/a	8 (boxes)	$8,000

GREEN INFRASTRUCTURE RECOMMENDATIONS

Daytop Preparatory School

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

0 50' 100'

GRACE LUTHERAN CHURCH

RAP ID: 2

Subwatershed: Raritan River North Branch

HUC14 ID: 02030105060010

Site Area: 88,239 sq. ft.

Address: 65 East Main Street
Mendham Borough, NJ 07945

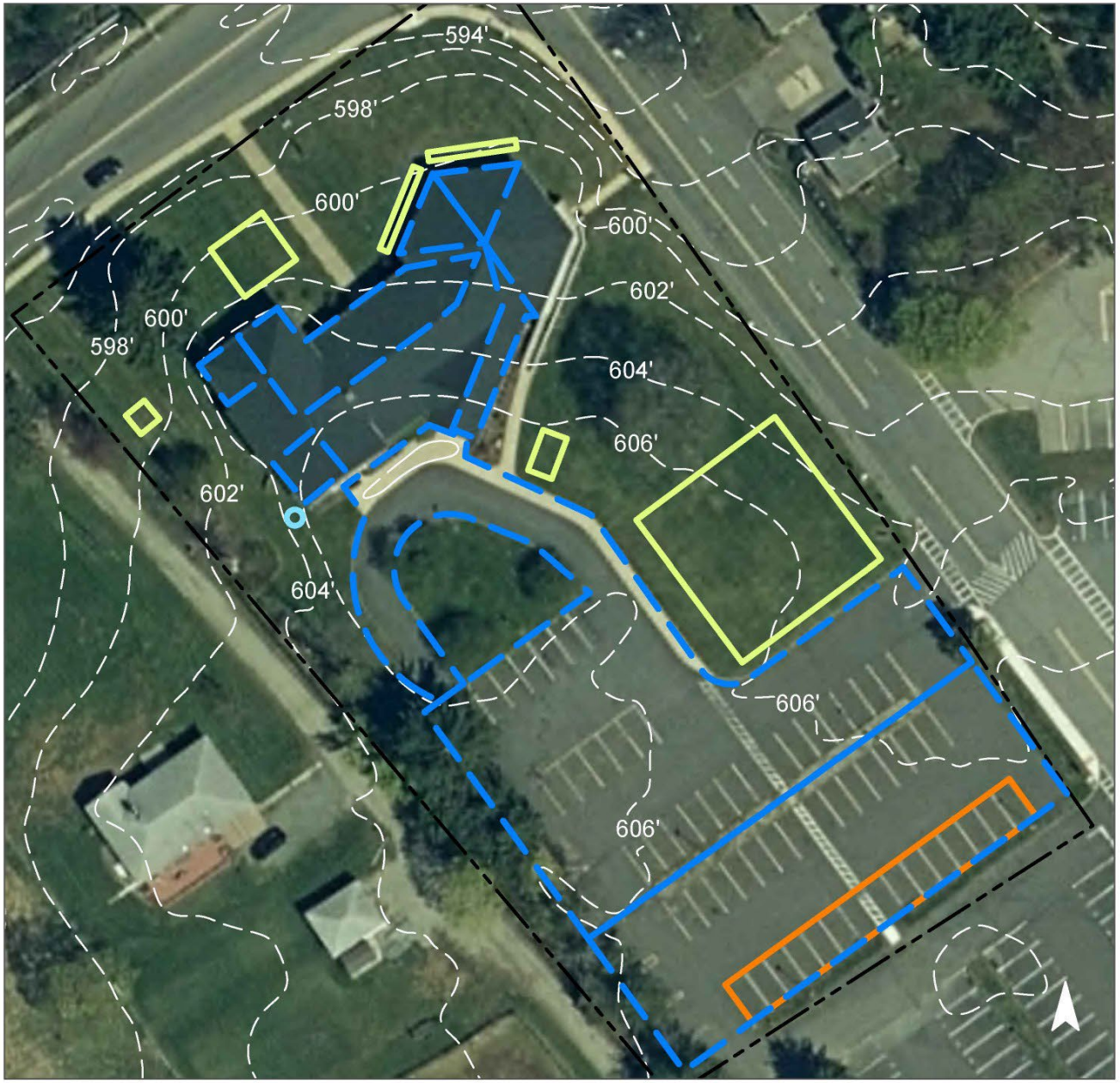
Block and Lot: Block 1401, Lot 68

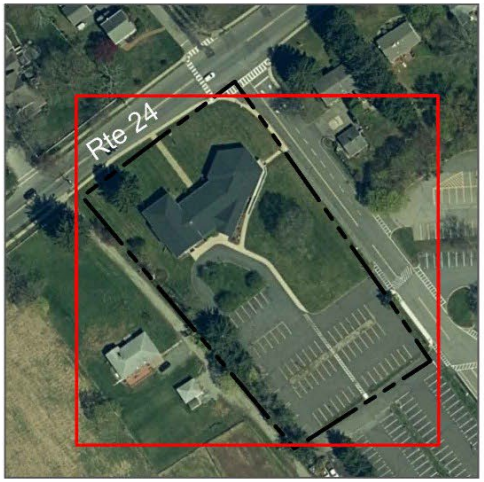
Rain gardens can be installed in multiple grass areas around the property to capture, treat, and infiltrate the stormwater runoff from the rooftop and parking lot. These may require downspout disconnections, redirection of downspouts underneath the sidewalk, trench drains, and curb cuts. The southernmost parking spaces can be converted into pervious pavement to capture and infiltrate the stormwater runoff from the asphalt lot. A trench drain may be required. A cistern can be installed to the southwest of the building to divert and detainthe stormwater runoff from the rooftop for later non-potable reuse such as watering garden beds. 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 50"
53	47,168	2.3	23.8	216.6	0.037	1.47

Recommended Green Infrastructure Practices	Drainage Area (sq. ft.)	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	23,315	0.690	103	48,630	1.83	5,830	$58,300
Pervious pavement	11,905	0.352	51	24,830	0.93	2,485	$62,125
Rainwater harvesting	400	0.012	2	350	0.01	350 (gal)	$1,050

GREEN INFRASTRUCTURE RECOMMENDATIONS





Grace Lutheran Church

- bioretention system
- pervious pavement
- rainwater harvesting
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 30' 60'

HILLTOP PRESBYTERIAN CHURCH

RAP ID: 3

Subwatershed: Raritan River North Branch

Site Area: 100,931 sq. ft.

Address: 20 Hilltop Road
Mendham, NJ 07945

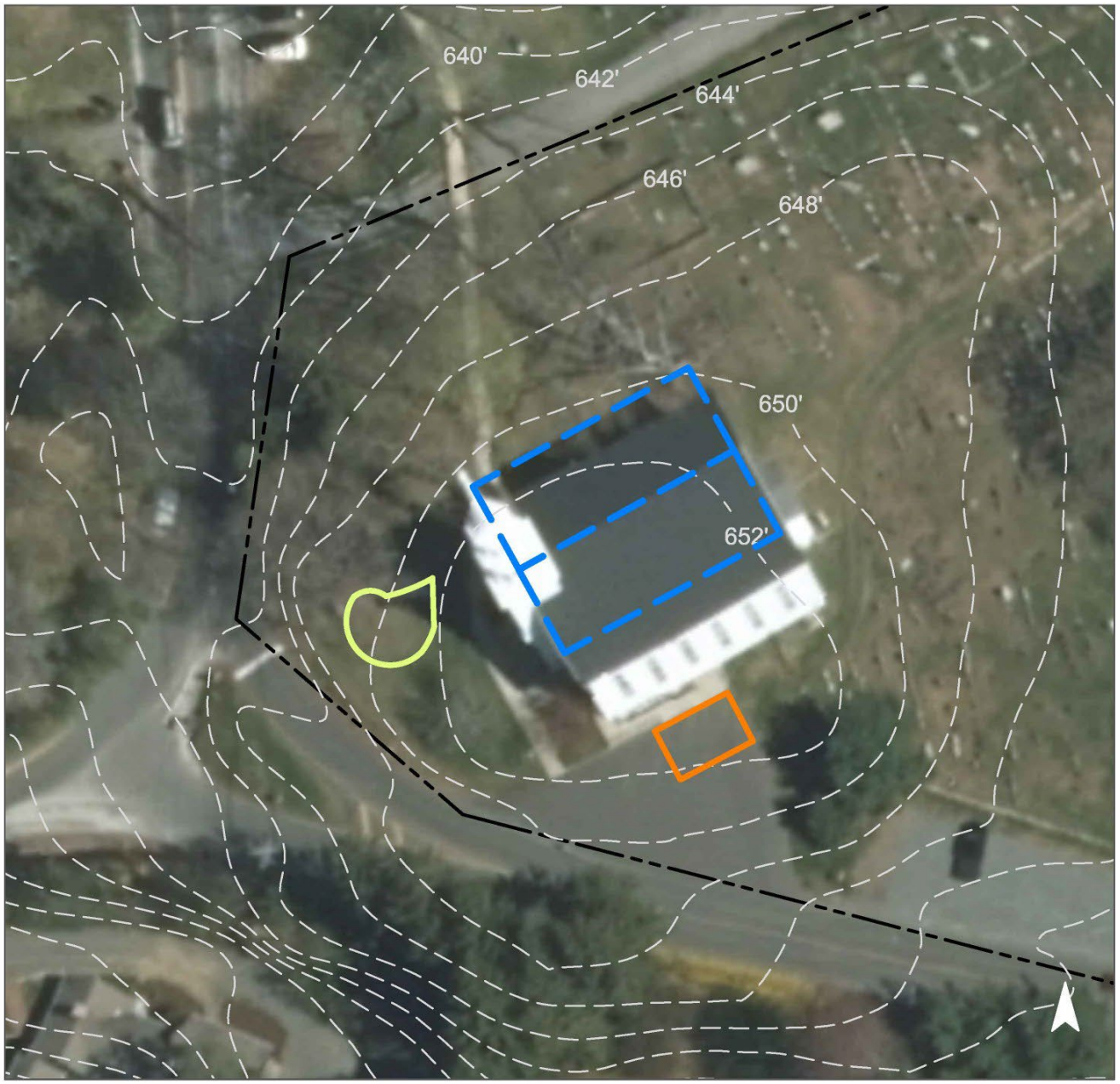
Block and Lot: Block 1501, Lot 31

A small section of pervious pavement in parking spaces near the entrance can capture rooftop runoff and help prevent pooling in the adjacent street. Additionally, a rain garden can be installed in front of the building to capture, treat, and infiltrate 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"
33	32,966	1.6	16.6	151.4	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
Bioretention system	0.065	11	4,780	0.18	650	$3,250
Pervious pavement	0.065	11	4,780	0.18	445	$11,125

GREEN INFRASTRUCTURE RECOMMENDATIONS



Hilltop Presbyterian Church

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

0 25' 50'

MENDHAM BOROUGH LIBRARY

RAP ID: 4

Subwatershed: Raritan River North Branch

Site Area: 18,324 sq. ft.

Address: 10 Hilltop Road
Mendham, NJ 07945

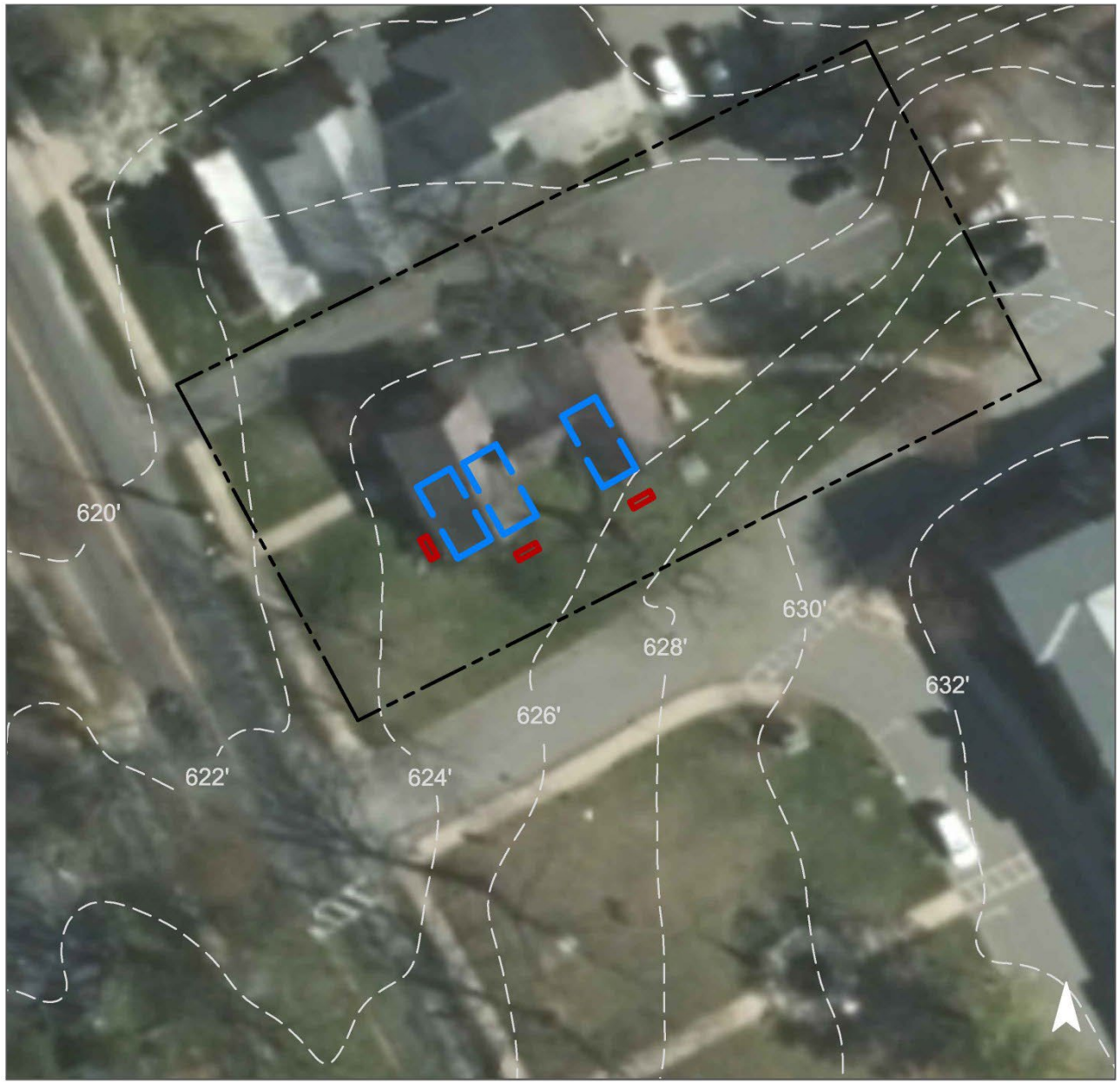
Block and Lot: Block 1501, Lot 37

The rooftop drainage area can be treated by the installation of downspout planter boxes around the building near downspouts. 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"
74	13,553	0.7	6.8	62.2	0.011	0.37

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Planter boxes	n/a	2	n/a	n/a	3 (boxes)	$3,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Mendham Borough Library

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

0 20' 40'

MENDHAM BOROUGH PARK

RAP ID: 5

Subwatershed: Raritan River North Branch

HUC14 ID: 02030105060010

Site Area: 622,058 sq. ft.

Address: 8 Orchard Street
Mendham Borough, NJ
07945

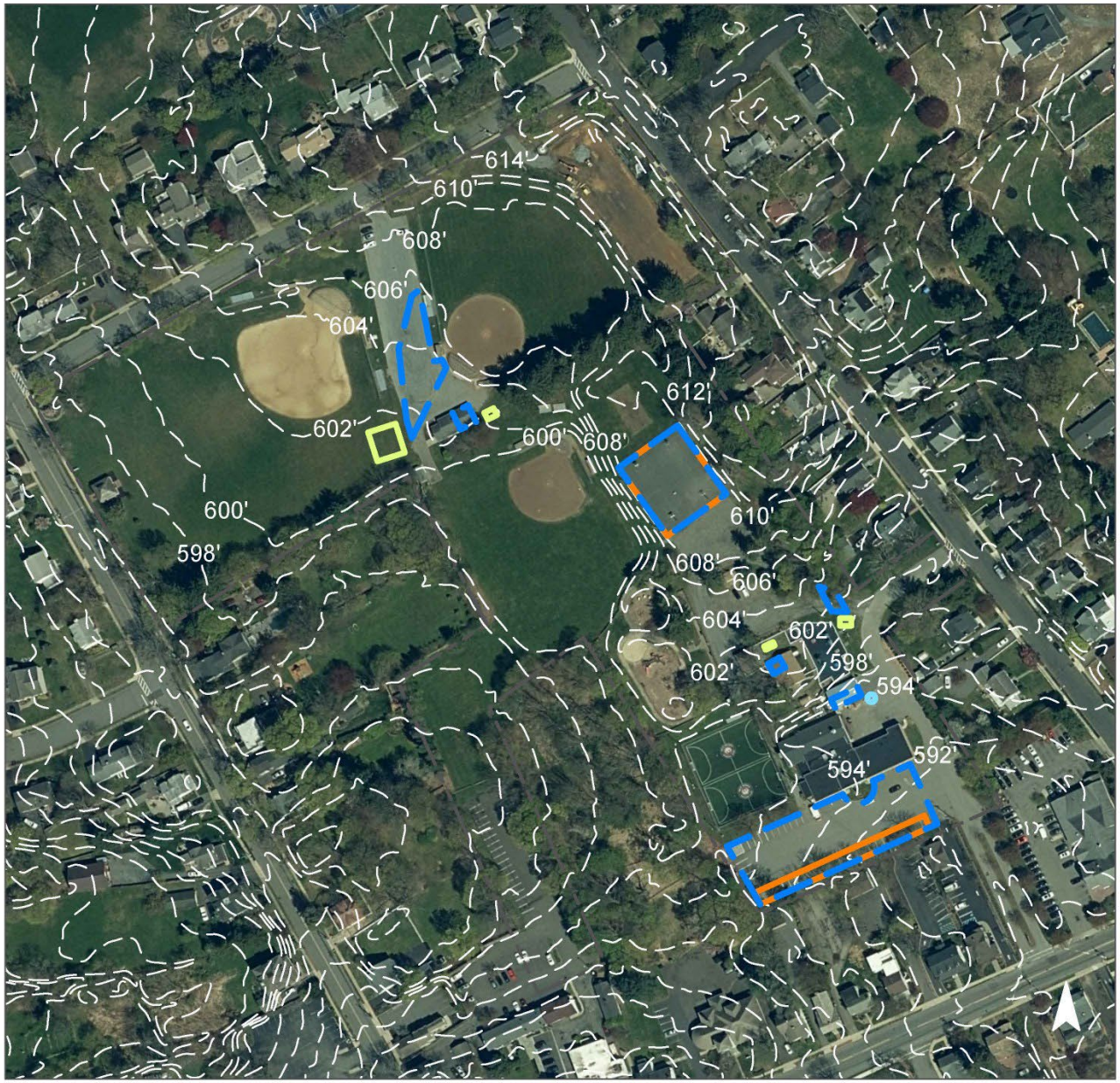
Block and Lot: Block 601, Lot 16

Rain gardens can be installed in multiple grass areas around the property to capture, treat, and infiltrate the stormwater ru noff from rooftops, a driveway, and a parking lot. Downspout redirection and redirection beneath a sidewalk may be required. The rain garden to the east of the carriage house c an be constructed around the nearby catch basin. Parking spaces to the south of fire department can be converted into pervious pavement to capture and infiltrate the stormwater runoff from the asphalt lot. The basketball court can also be converted into pervious pavement to capture and infiltrate stormwater runoff from the court. A cistern can be installed to the south of the shed near the fire department to divert and detain the stormwa ter runoff from the rooftop for later non-potable reuse such as washing vehicles. A gutter system would need to be installed on the structure. A preliminary soil asse ssment 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 50"
30	188,732	9.1	95.3	866.5	0.147	5.88

Recommended Green Infrastructure Practices	Drainage Area (sq. ft.)	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	25,860	0.766	112	53,940	2.03	6,465	$64,650
Pervious pavement	32,170	0.953	141	67,100	2.52	14,600	$365,000
Rainwater harvesting	455	0.013	2	400	0.02	400 (gal)	$1,200

GREEN INFRASTRUCTURE RECOMMENDATIONS



Mendham Borough Park

- bioretention system
- pervious pavement
- rainwater harvesting
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 100' 200'

MENDHAM BOROUGH PUBLIC WORKS GARAGE

RAP ID: 6

Subwatershed: Raritan River North Branch

Site Area: 658,388 sq. ft.

Address: 37 Ironia Road
Mendham, NJ 07945

Block and Lot: Block 201, Lot 6

Two cisterns can be installed adjacent to the building to treat the building's drainage area. 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"
14	89,604	4.3	45.3	411.4	0.070	2.46

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Rainwater harvesting	0.067	11	2,000	0.07	2,000 (gal)	$4,000

GREEN INFRASTRUCTURE RECOMMENDATIONS

Mendham Borough
Public Works Garage

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

0 25' 50'

MENDHAM RECREATION DEPARTMENT

RAP ID: 7

Subwatershed: Raritan River North Branch

Site Area: 8,097 sq. ft.

Address: 2 West Main Street
Mendham, NJ 07945

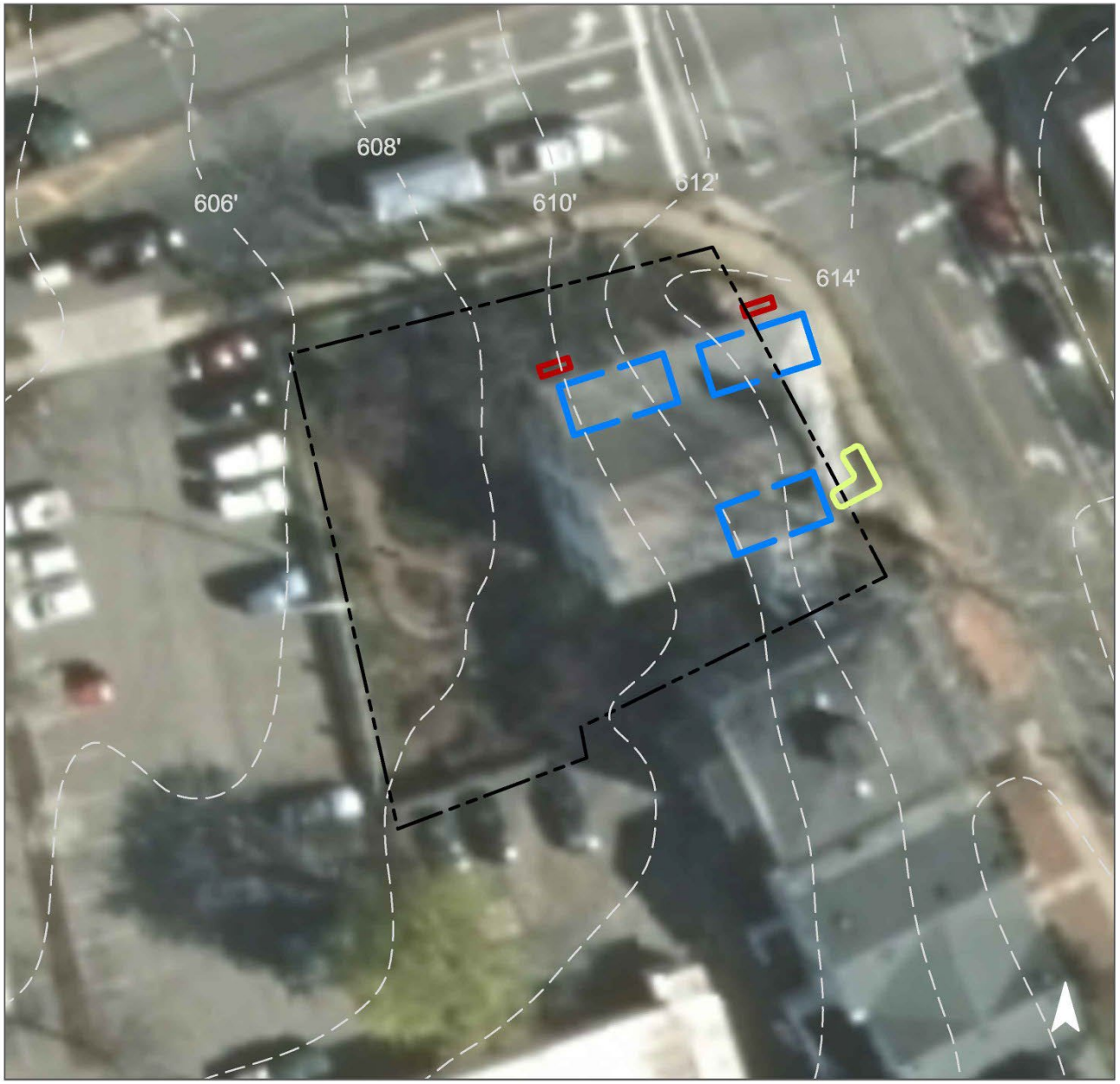
Block and Lot: Block 1902, Lot 24

A section of the rooftop runoff can be treated with a small rain garden, and two additional sections of the roof can be treated with two downspout planter boxes. 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"
84	6,778	0.3	3.4	31.1	0.005	0.19

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention system	0.005	1	380	0.01	55	$275
Planter boxes	n/a	2	n/a	n/a	2 (boxes)	$2,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Mendham Recreation Department

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

0 25' 50'

ST. JOSEPH'S SCHOOL

RAP ID: 8

Subwatershed: Raritan River North Branch

HUC14 ID: 02030105060010

Site Area: 178,483 sq. ft.

Address: 8 West Main Street
Mendham Borough, NJ 07945

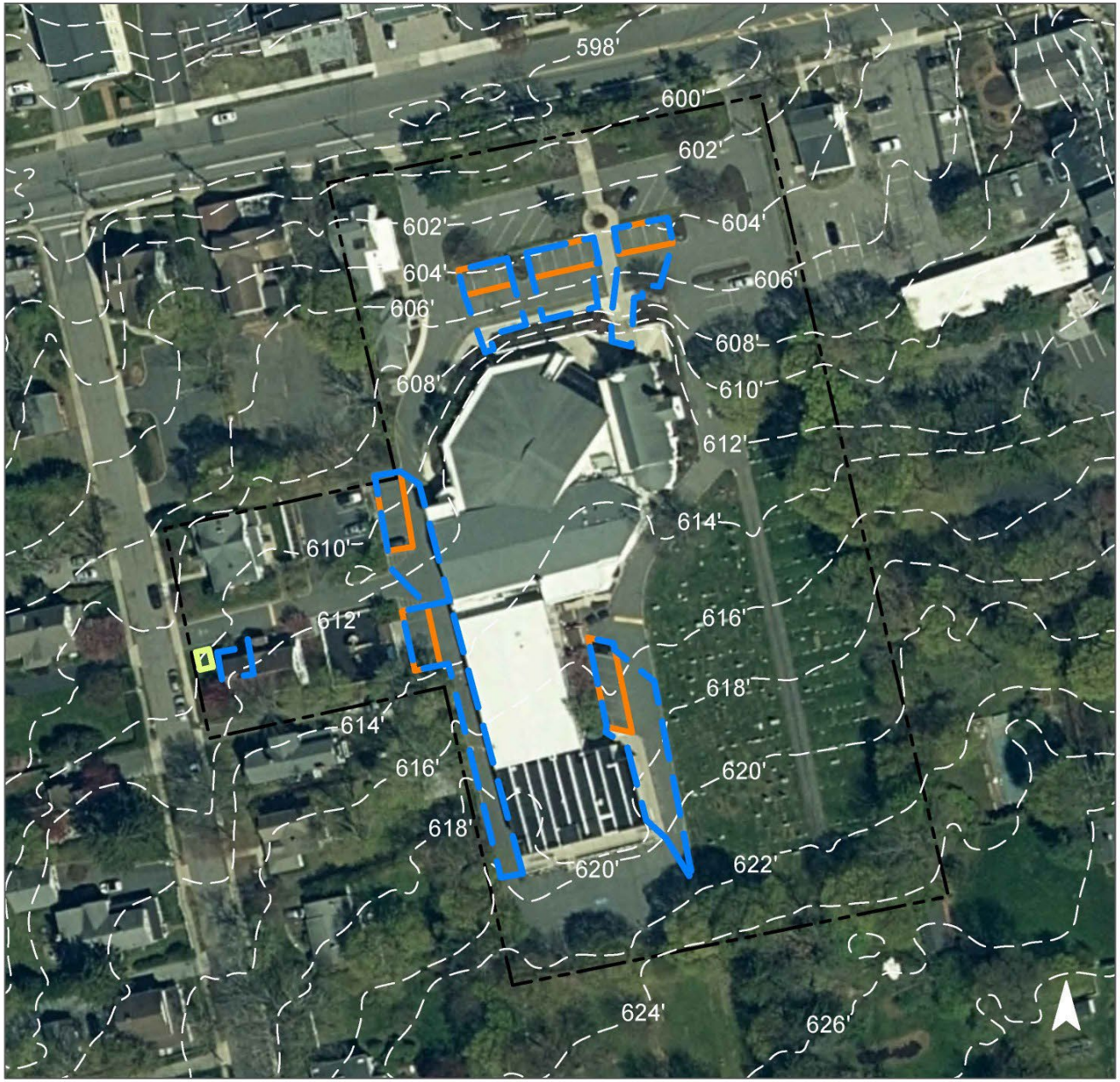
Block and Lot: Block 1902, Lots 3, 4 & 27

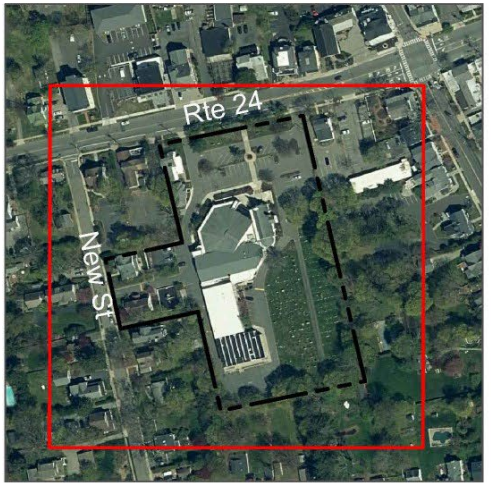
A rain garden can be installed near the western parish house to capture, treat, and infiltrate the stormwater runoff from the rooftop. This will require downspout redirection. Existing parking spaces to the north, west, and east of the building can be converted into pervious pavement to capture and infiltrate the stormwater runoff from the asphalt. 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 50"
65	188,732	5.6	59.0	536.7	0.091	3.64

Recommended Green Infrastructure Practices	Drainage Area (sq. ft.)	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	415	0.012	2	870	0.03	105	$1,050
Pervious pavement	14,775	0.437	65	30,820	1.16	4,395	$109,875

GREEN INFRASTRUCTURE RECOMMENDATIONS





St. Joseph's School

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 50' 100'

ST. MARK'S EPISCOPAL CHURCH

RAP ID: 9

Subwatershed: Raritan River North Branch

Site Area: 32,559 sq. ft.

Address: 9 East Main Street
Mendham, NJ 07945

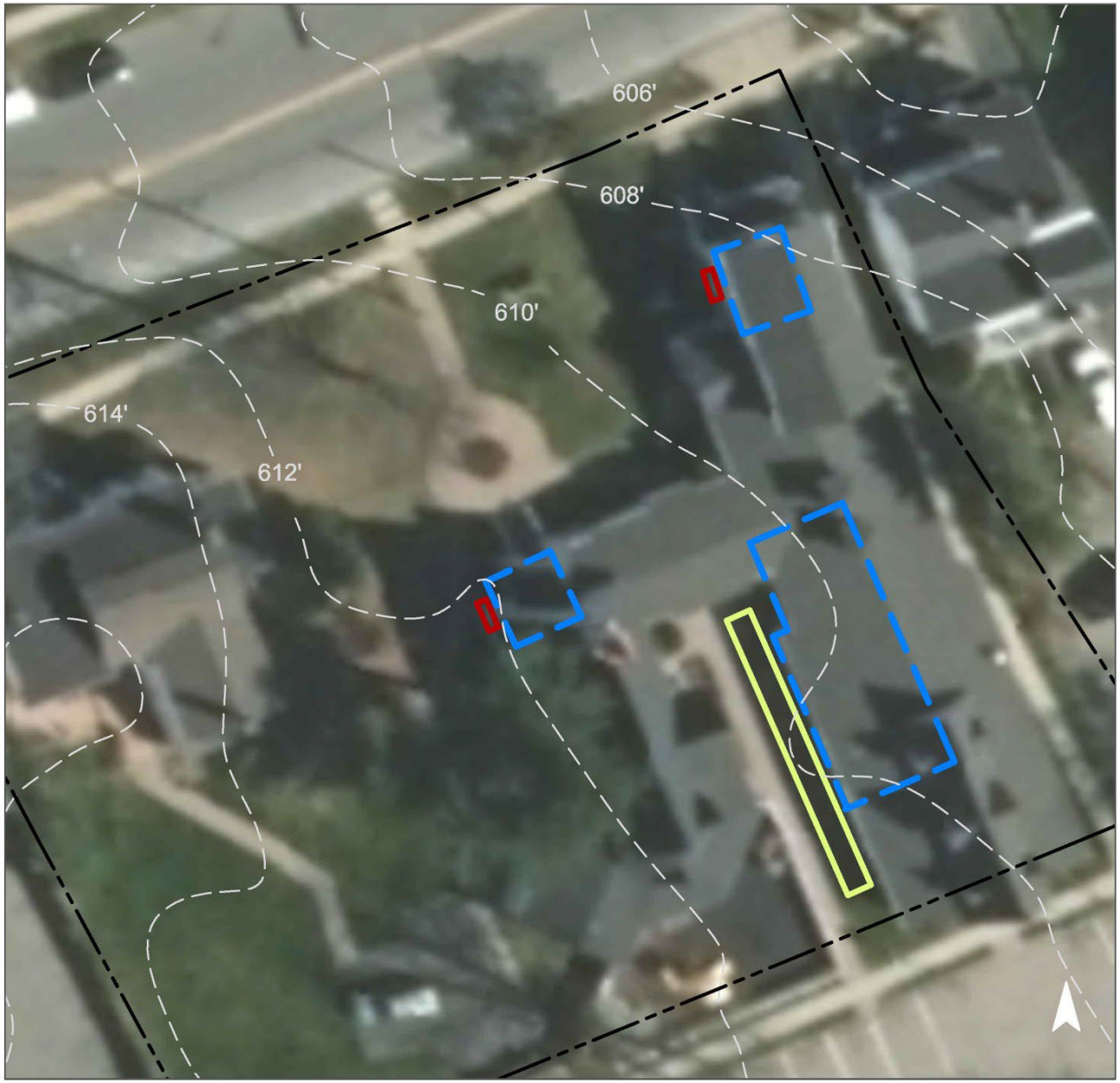
Block and Lot: Block 1501, Lot 4

A rain garden can be installed near the rear entrance of the building to capture, treat, and infiltrate the water from five nearby connected downspouts. Two downspout planter boxes can be installed to capture rooftop runoff from different sections of the building. 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"
75	24,471	1.2	12.4	112.4	0.019	0.67

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	0.031	5	2,300	0.09	300	$1,500
Planter boxes	n/a	1	n/a	n/a	2	$2,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



St. Mark's Episcopal Church

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

0 15' 30'

ATLANTIC CARDIOLOGY GROUP, LLP

RAP ID: 10

Subwatershed: Upper Passaic River

Site Area: 104,400 sq. ft.

Address: 8 Tempe Wick Road
Mendham, NJ 07945

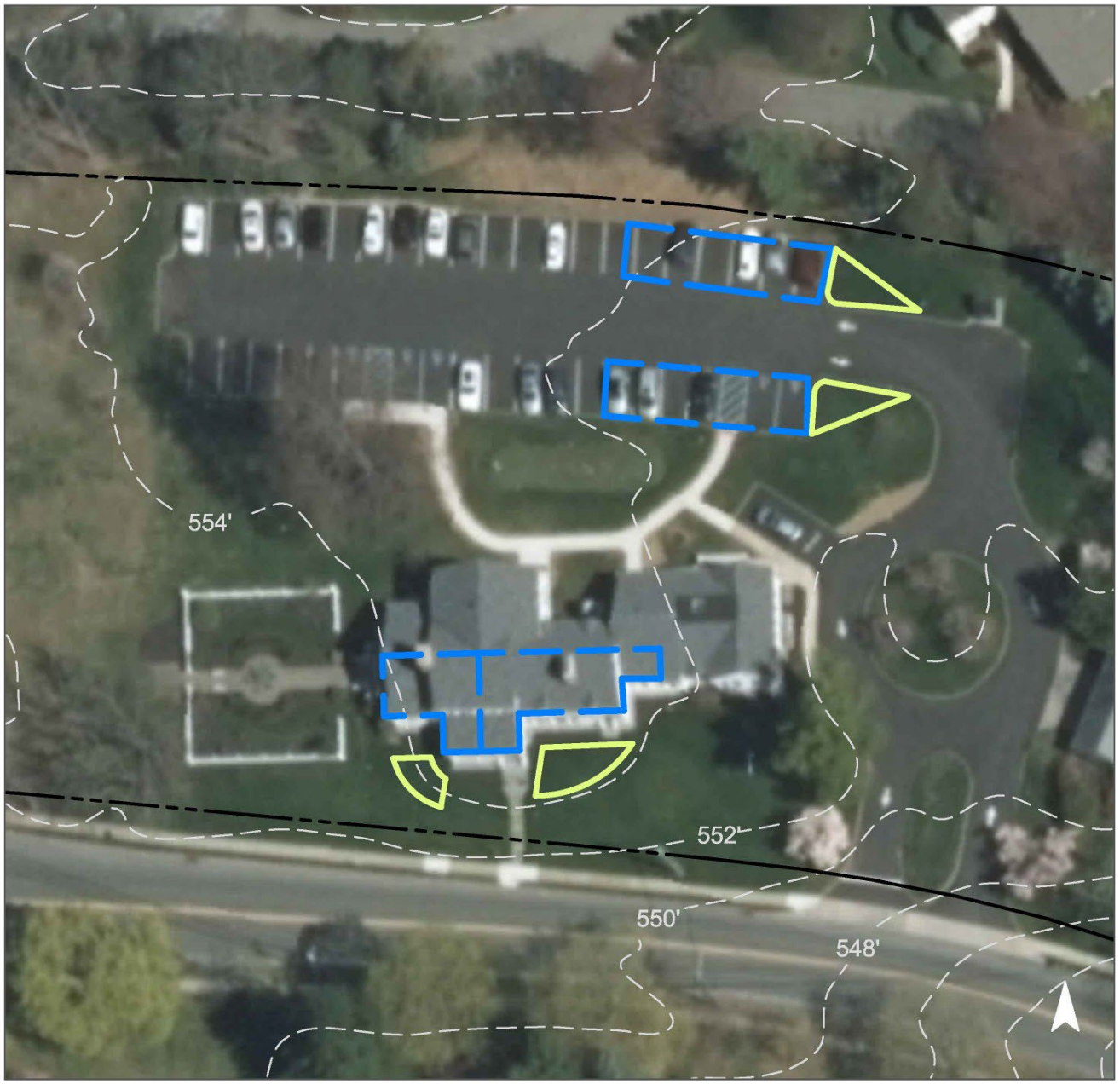
Block and Lot: Block 2701, Lots 9,10,11

Rain gardens can be installed throughout the property to capture, treat, and infiltrate stormwater runoff from both the rooftop and the parking lot areas. 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"
69	71,602	3.5	36.2	328.8	0.056	1.96

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	0.109	18	8,030	0.30	1,050	$5,250

GREEN INFRASTRUCTURE RECOMMENDATIONS



Atlantic Cardiology Group, LLP

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

0 25' 50'

HILLTOP ELEMENTARY SCHOOL

RAP ID: 11

Subwatershed: Upper Passaic River

Site Area: 514,676 sq. ft.

Address: 12 Hilltop Road
Mendham, NJ 07945

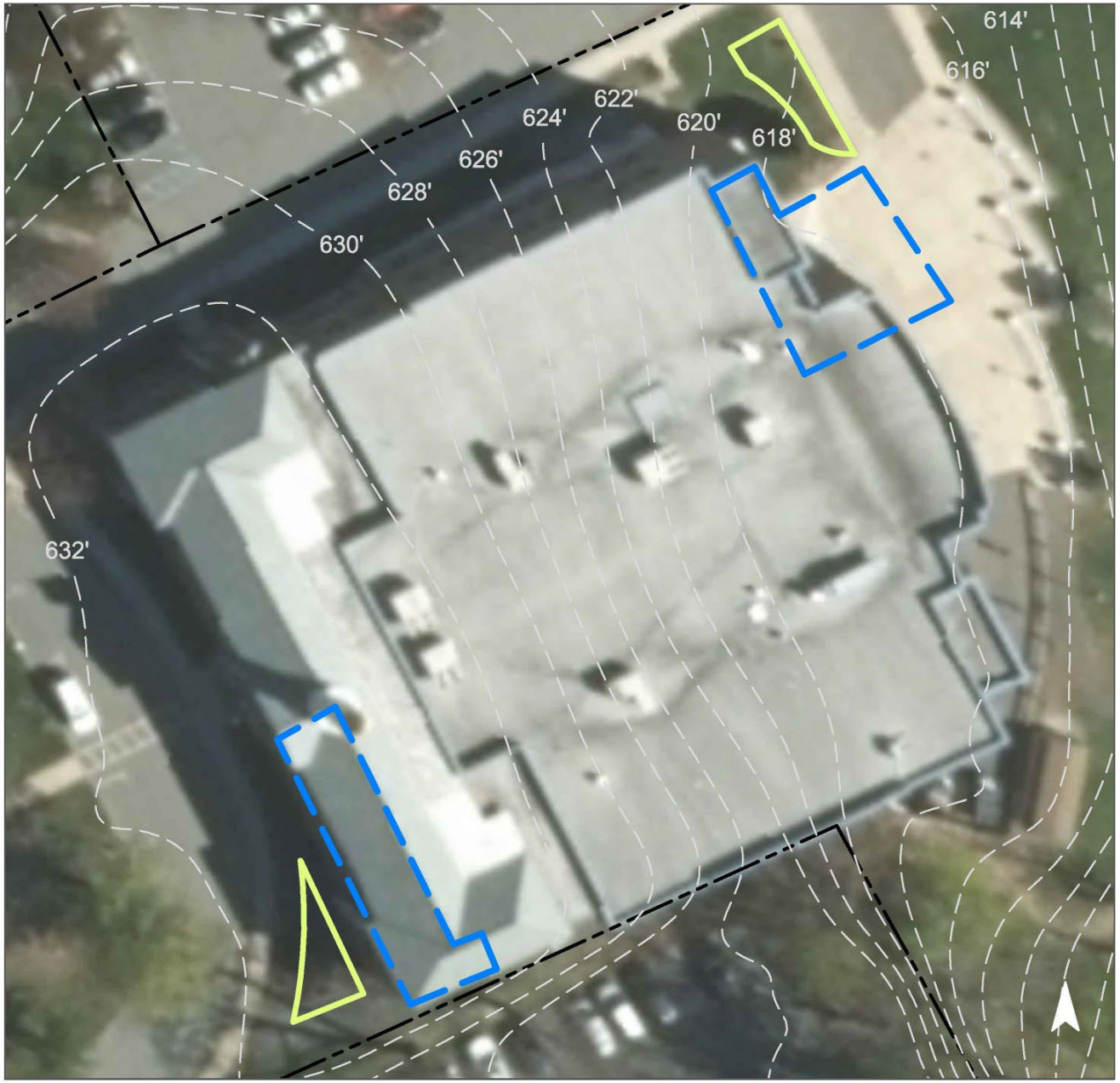
Block and Lot: Block 1501, Lot 35

Two rain gardens can be installed in the front and back of the building in the turfgrass areas to help infiltrate the water from the nearby downspouts. 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"
18	91,769	4.4	46.3	421.3	0.072	2.52

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	0.085	14	6,250	0.23	815	$4,075

GREEN INFRASTRUCTURE RECOMMENDATIONS



Hilltop Elementary School

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

0 20' 40'

MENDHAM BOROUGH POLICE DEPARTMENT

RAP ID: 12

Subwatershed: Upper Passaic River

HUC14 ID: 02030103010010

Site Area: 32,420 sq. ft.

Address: 3 Cold Hill Road South
Mendham Borough, NJ 07945

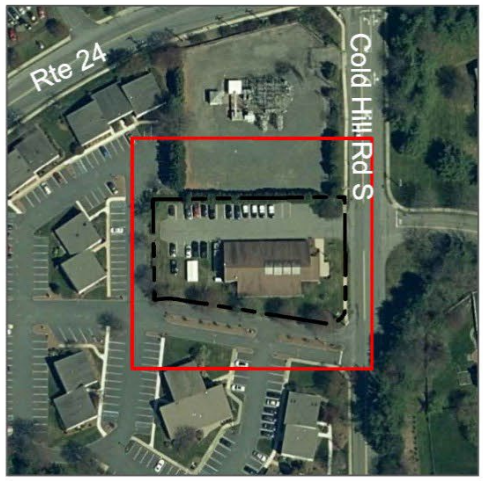
Block and Lot: Block 2701, Lot 4

A rain garden can be installed to the east of the building using the disconnected downspouts to capture, treat, and infiltrate the stormwater runoff from the rooftop. Two rain gardens can be installed to the east and west of the shed to capture, treat, and infiltrate stormwater runoff from the rooftop. Existing parking spaces on the western side of the lot can be converted into pervious pavement to capture and infiltrate the stormwater runoff from the asphalt. This may require trench drains. 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 50"
68	22,136	1.1	11.2	101.6	0.017	0.69

Recommended Green Infrastructure Practices	Drainage Area (sq. ft.)	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	2,130	0.063	10	4,440	0.17	530	$5,300
Pervious pavement	3,350	0.099	15	6,990	0.26	845	$21,125

GREEN INFRASTRUCTURE RECOMMENDATIONS



Mendham Borough Police Department

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 20' 40'

MENDHAM POST OFFICE

RAP ID: 13

Subwatershed: Upper Passaic River

Site Area: 36,879 sq. ft.

Address: 2 Tempe Wick Road
Mendham, NJ 07945

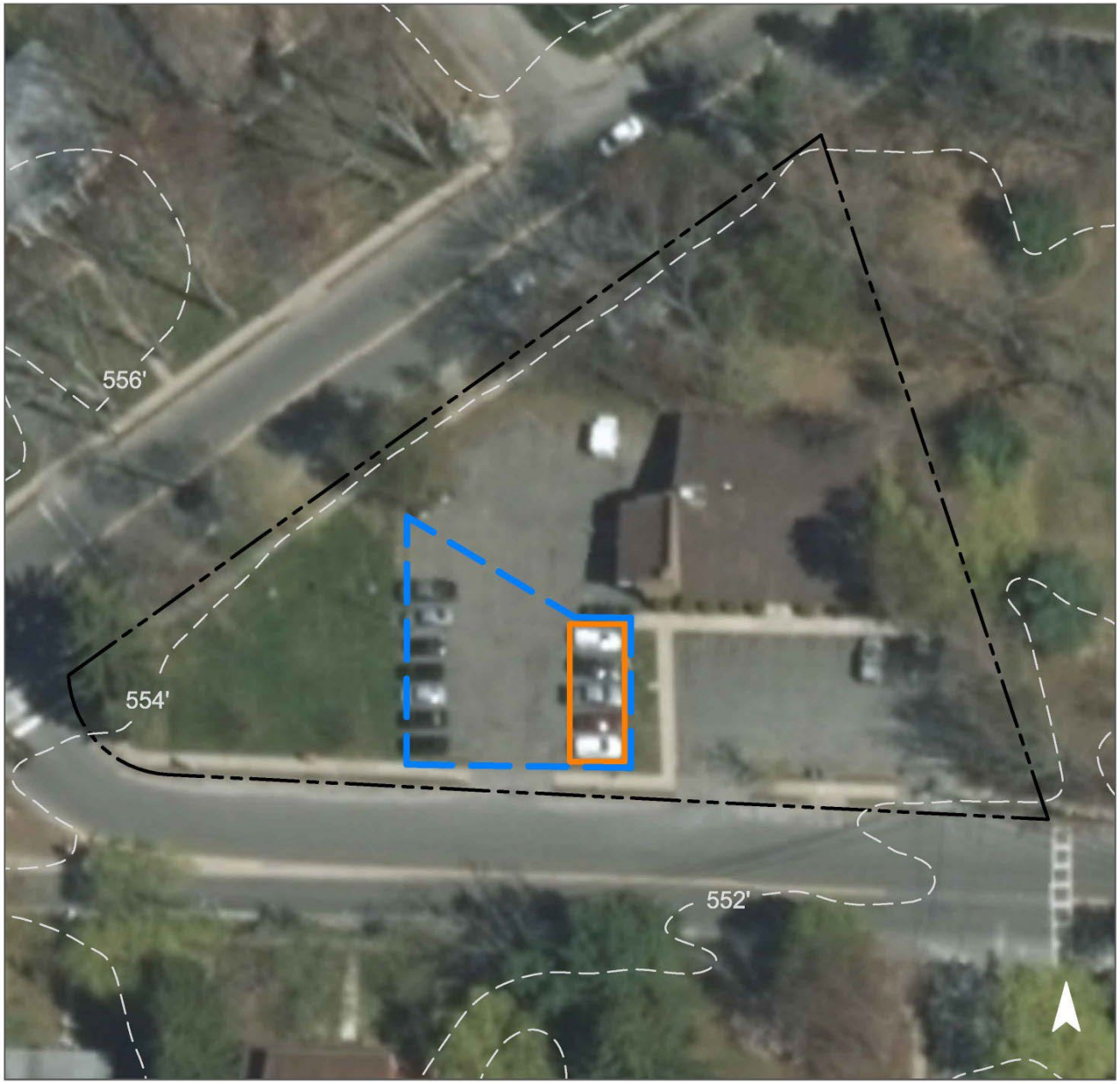
Block and Lot: Block 2701, Lot 1

- Pervious pavement can be installed in parking spaces to treat runoff from the parking lot. A preliminary soil assessment sug gests 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"
69	25,330	1.2	12.8	116.3	0.020	0.69

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	0.118	20	8,670	0.33	810	$20,250

GREEN INFRASTRUCTURE RECOMMENDATIONS



Mendham Post Office

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

0 25' 50'

MENDHAM UNITED METHODIST CHURCH

RAP ID: 14

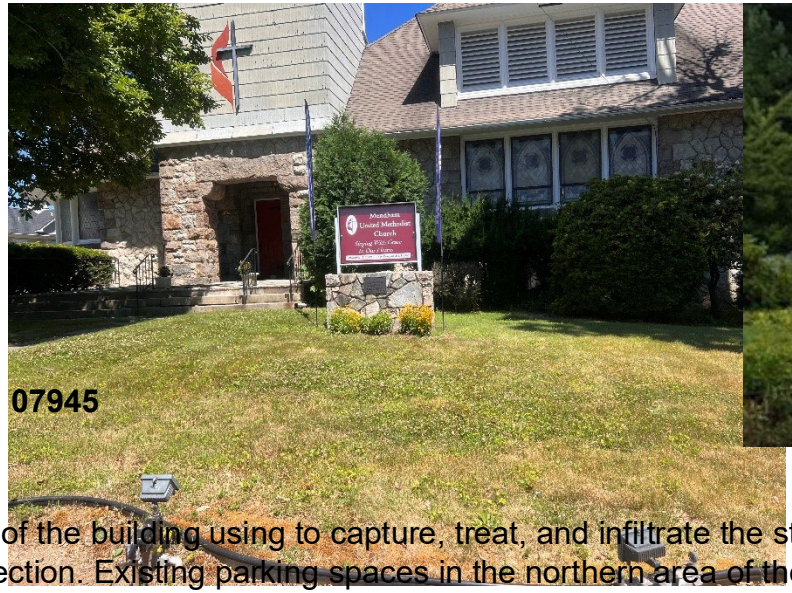
Subwatershed: Upper Passaic River

HUC14 ID: 02030103010010

Site Area: 102,831 sq. ft.

Address: 10 East Main Street
Mendham Borough, NJ 07945

Block and Lot: Block 601, Lot 5

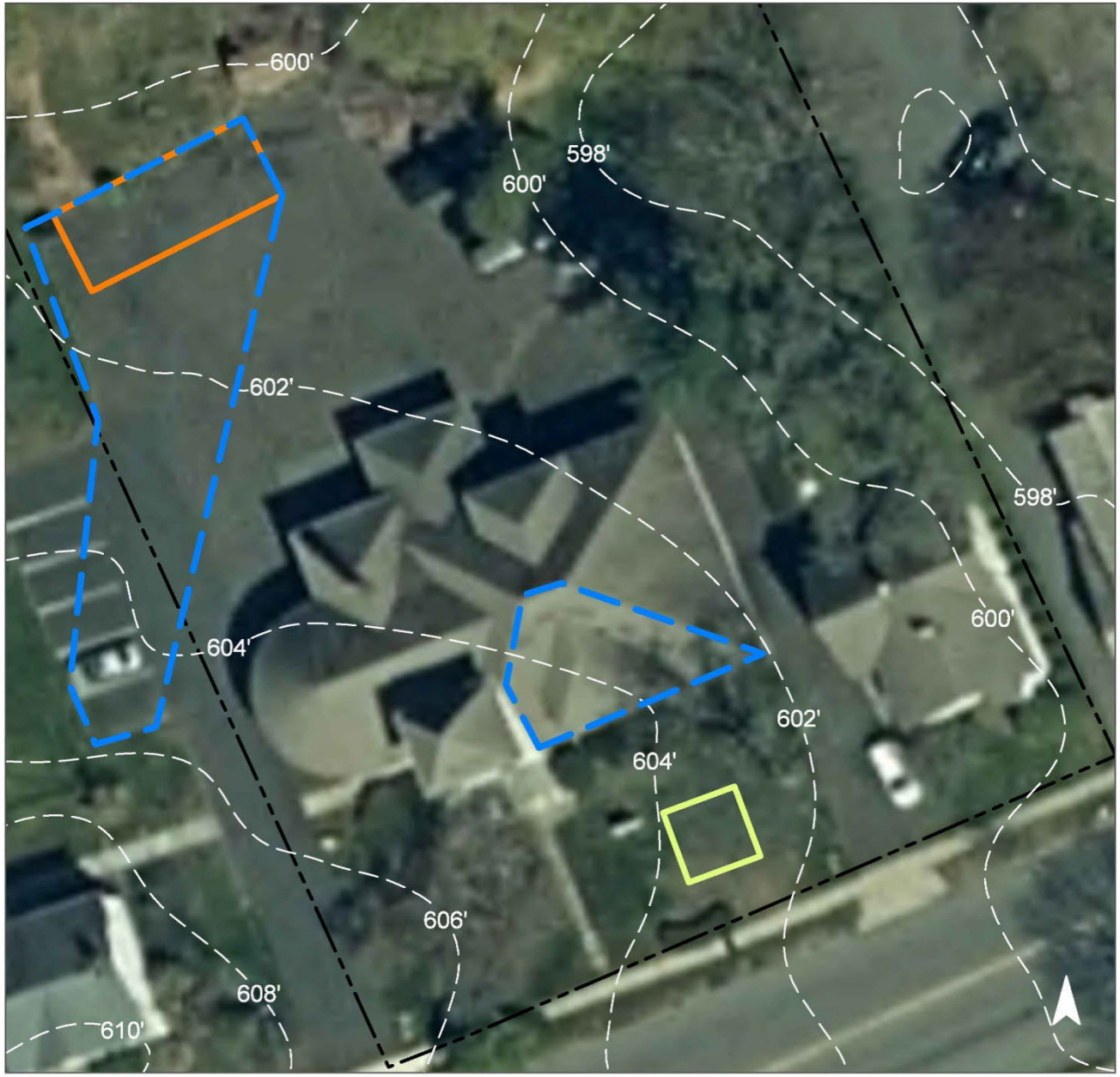


A rain garden can be installed to the south of the building using to capture, treat, and infiltrate the stormwater runoff from the rooftop. This will require downspout disconnection and redirection. Existing parking spaces in the northern area of the lot can be converted into pervious pavement to capture and infiltrate the stormwater runoff from the asphalt. 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 50"
20	20,403	1.0	10.3	93.7	0.016	0.64

Recommended Green Infrastructure Practices	Drainage Area (sq. ft.)	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	870	0.026	4	1,820	0.07	220	$2,200
Pervious pavement	3,310	0.098	15	6,900	0.26	715	$17,875

GREEN INFRASTRUCTURE RECOMMENDATIONS



Mendham United Methodist Church

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 15' 30'

NAILS OF MENDHAM & GRAND BAZAAR

RAP ID: 15

Subwatershed: Upper Passaic River

Site Area: 18,120 sq. ft.

Address: 6 Hilltop Road
Mendham, NJ 07945

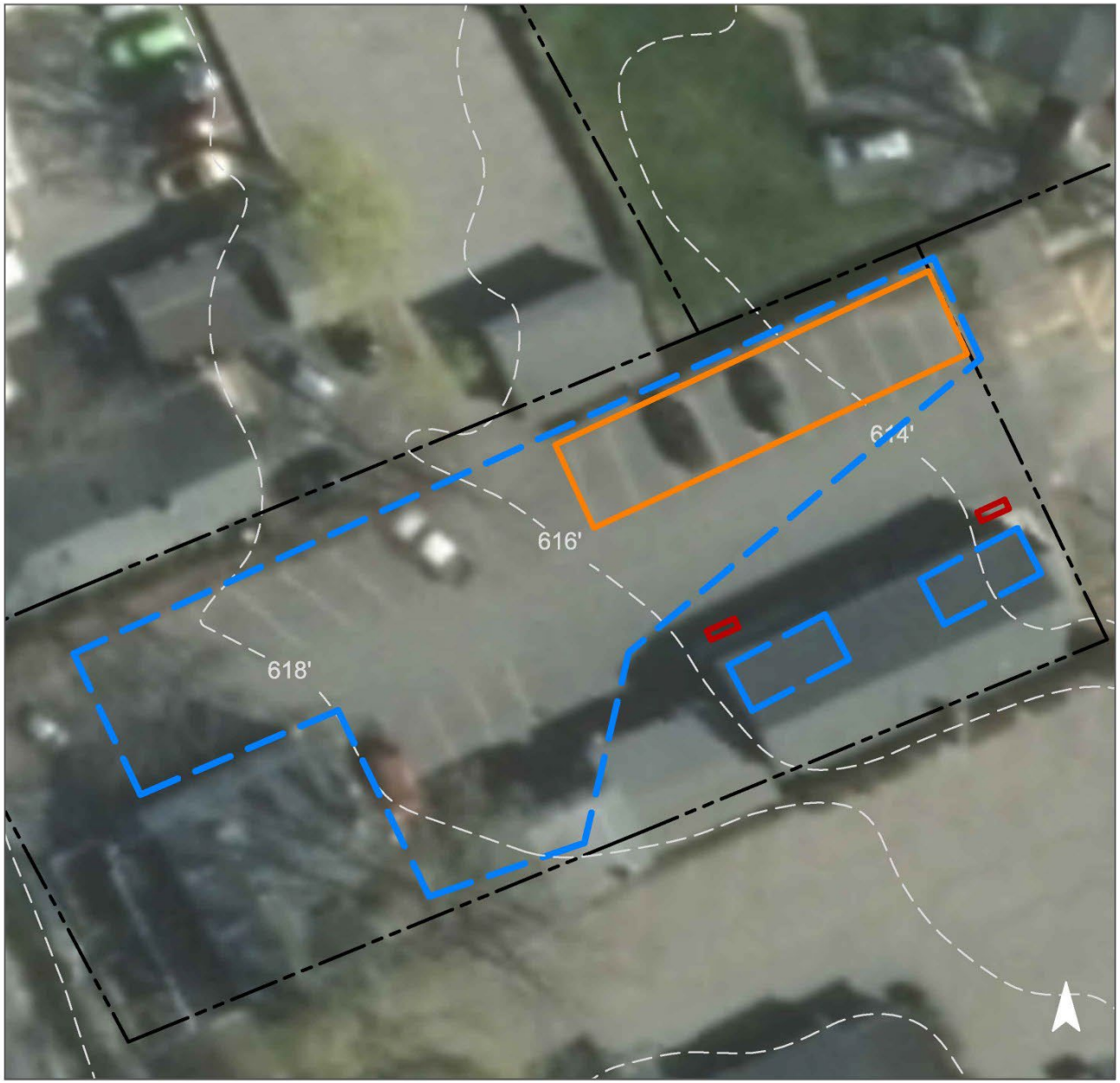
Block and Lot: Block 1501, Lot 41

Pervious pavement can be installed to decrease the pooling and erosion caused by the pitch of the pavement and the downspouts leading to the northeast corner of the parking lot. Downspout planter boxes can also be installed to capture runoff from the rooftop. 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"
79	14,252	0.7	7.2	65.4	0.011	0.39

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	0.213	36	15,630	0.59	1,460	$36,500
Planter boxes	n/a	4	n/a	n/a	2 (boxes)	$2,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Nails of Mendham & Grand Bazaar

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

0 15' 30'

WEST MORRIS MENDHAM HIGH SCHOOL

RAP ID: 16

Subwatershed: Upper Passaic River

HUC14 ID: 02030103010010

Site Area: 1,980,479 sq. ft.

Address: 65 East Main Street
Mendham Borough, NJ 07945

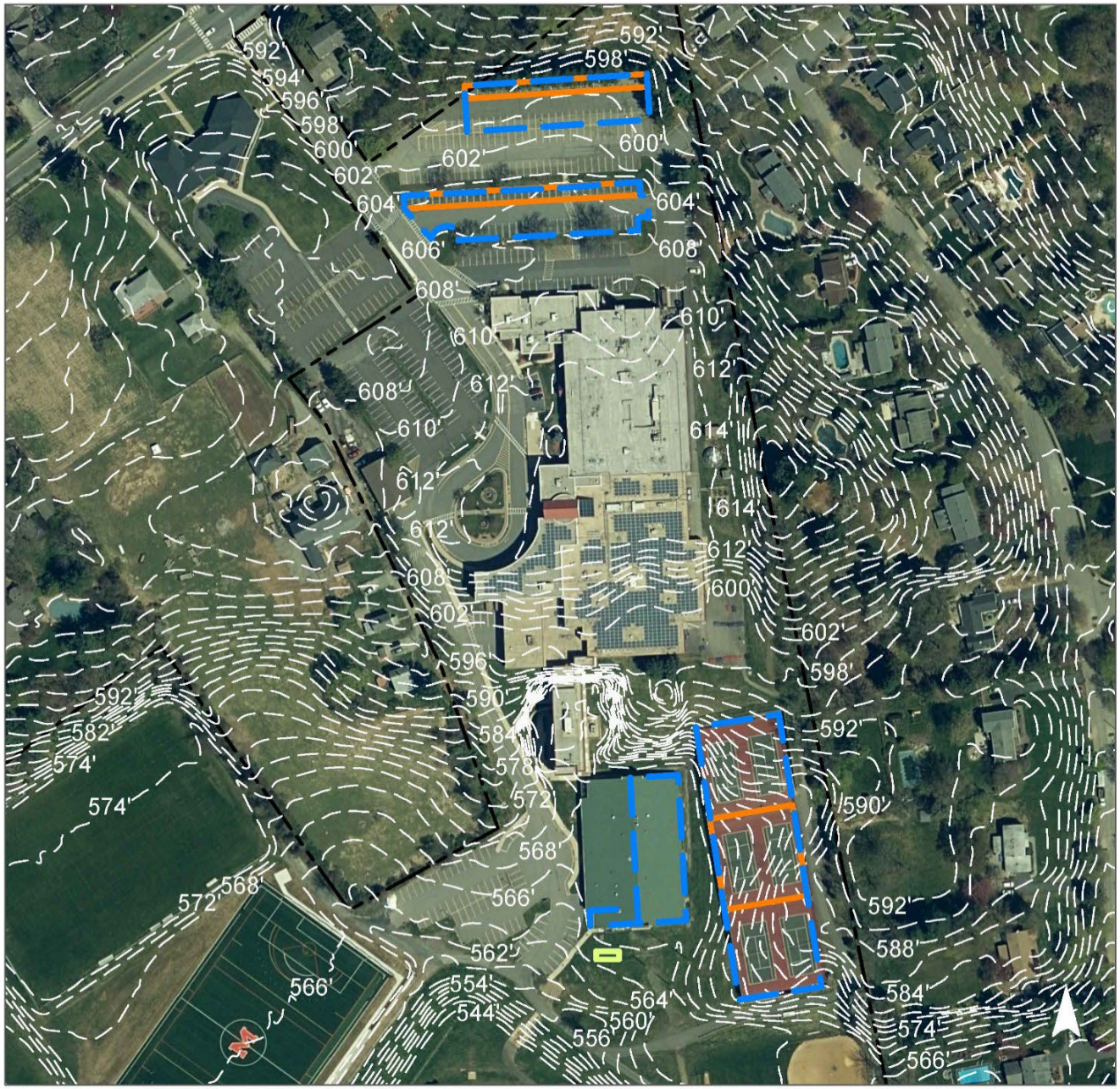
Block and Lot: Block 1401, Lots 8 & 9

A rain garden can be installed to the south corner of the building near the tennis courts to capture, treat, and infiltrate the stormwater runoff from the rooftop. This will require downspout disconnection and redirection. The center tennis courts can be converted into pervious pavement to capture and infiltrate the stormwater runoff from all the courts. The downspouts on the adjacent building can be disconnected and redirected to the courts as well, to manage rooftop runoff with the pervious pavement. Existing parking spaces in the northern lot can be converted into pervious pavement to capture and infiltrate stormwater runoff from the asphalt. Trench drains may be required. 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 50"
34	667,501	32.2	337.1	3,064.7	0.520	20.80

Recommended Green Infrastructure Practices	Drainage Area (sq. ft.)	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	1,260	0.037	6	2,630	0.10	315	$3,150
Pervious pavement	83,990	2.487	367	175,190	6.58	22,550	$563,750

GREEN INFRASTRUCTURE RECOMMENDATIONS



West Morris Mendham High School

- bioretention system
- pervious pavement
- captured drainage area
- property line
- 2020 Aerial: NJOIT, OGIS

0 100' 200'

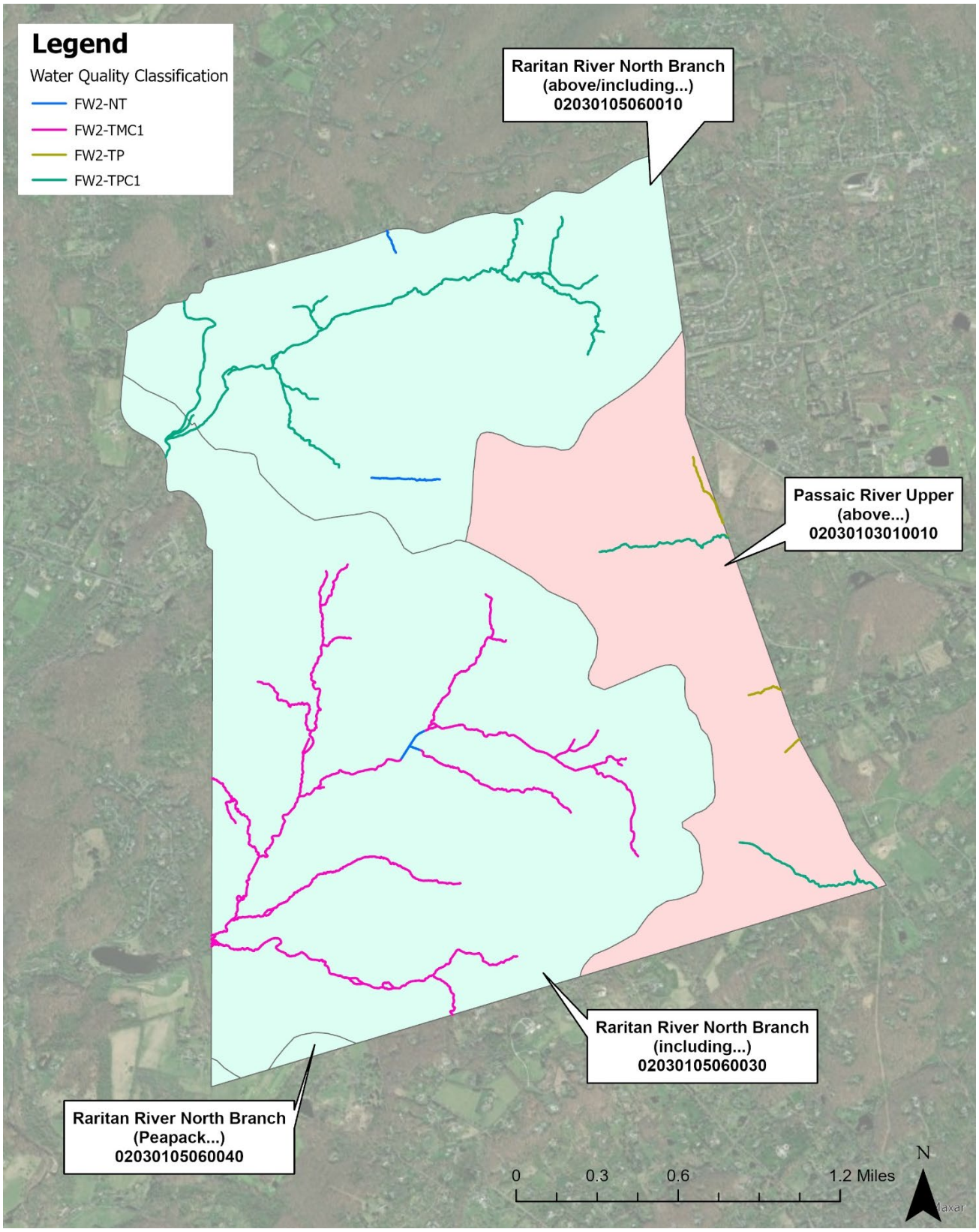


Figure 13. Water Quality Classification of Surface Waters in Mendham Borough

Table 11. Water Quality Classification of Surface Waters in Mendham Borough

Surface Water Quality Classification	Surface Water Quality Code	Miles	Percent of Municipal Streams
Freshwater 2, non-trout	FW2-NT	0.6	3.3%
Freshwater 2, trout production, Category One	FW2-TPC1	6.4	37.5%
Freshwater 2, trout production	FW2-TP	0.5	3.0%
Freshwater 2, trout maintenance, Category One	FW2-TMC1	9.6	56.2%