7. Ecological Resources

7.1. Existing Conditions

7.1.1. Land Cover

Land cover has been identified and mapped via spectral analysis of Year 2007 color-infrared imagery for the six study areas, i.e., Areas A, B, C, D, E and F. (The source of the imagery – for which the spectral classification was conducted – is the New York State Office of Cybersecurity and Critical Infrastructure Coordination.)

The land cover classification comprises seven categories as follows:

1. Coniferous Forest – patches or contiguous areas of needle-leaved, evergreen and/or cone-bearing trees (e.g., pines, spruces and firs)

2. Deciduous Forest – patches or contiguous areas of trees that shed foliage at end of growing season (e.g., oaks, maples)

3. Developed Impervious – manmade surfaces that shed precipitation (e.g., buildings and paved surfaces)

4. Developed Pervious – disturbed areas that allow rainwater infiltration (e.g., gravel driveways and lots, cleared land including farmland, unpaved trails and/or other infrequently used rights-of-way)

5. Lawns / Landscaping – lawns maintained by homeowners, businesses and institutional uses that are regularly mowed

6. Unmanaged Grasslands – fields or patches of native grasses and forbs that are not regularly mowed; these can include previously cleared or disturbed areas adjacent to Developed Pervious areas

7. Shrub / Transitional – areas of low, woody plants that can include grasses and forbs, or areas that are transitioning from grassland to forest

The majority of land cover for all six study areas is comprised of deciduous and coniferous forest (Table 7-1) Deciduous forest, at approximately 230.3 acres in area, comprises the majority of the land cover, or 75.8% of the total; coniferous forested areas represent the next largest land cover class at 44.8 acres, or 14.8% of the total study area. Except for the southern half of Area D, conifers are typically found in patches within much larger swaths of deciduous forest. Thus, it may alternatively be concluded that the majority of land cover (i.e., 275.19 acres or 90.57% of the total) is mixed forest, i.e., an oak-pine association, that is dominated by deciduous (primarily oak) trees.

Table 7-1: Existing Land Cover Summary by Type and Acreage for all Areas.

Land Cover Class	Acreage	Percent of Total
Coniferous Forest	44.88	14.77%
Deciduous Forest	230.31	75.80%
Developed Impervious	6.29	2.07%
Developed Pervious	8.52	2.80%
Lawn / Landscaping	2.02	0.66%
Unmanaged Grassland	4.36	1.43%
Shrub / Transitional	7.48	2.46%
Totals	***277.36***	***100.00%***

Source: Spectral analysis of Year 2007 NY State Color-Infrared Imagery.

Land cover varies only slightly – with respect to its overall distribution by class – among Areas B through F. (See Table 7-2 for a breakdown of land cover by Area.) For example, forested areas – including Coniferous and Deciduous types – comprise more than 90 percent of the total land cover for each of Areas B through F. Areas B, C and E are more than 97 percent forested, while Areas D and F are approximately 91 and 93 percent forested, respectively. Because Areas B through F are not developed, they contain no Developed Impervious or Lawn/Landscaping land cover. Developed Pervious areas comprise a minimal amount of Areas B through F, i.e., less than 3 percent of cover for each. However, Shrub/ Transitional and Unmanaged Grassland are significant in Areas D and F, comprising 7.9 and 6.6 percent, respectively of their areas.

Table 7-2: Summary of Land Cover Classes for Areas A through F

Land Cover Type	Area A		Area B		Area C		Area D		Area E		Area F	
	Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent	Area	Percent
Conifer	1.60	4.69%	9.46	7.81%	2.11	7.44%	25.31	26.72%	4.13	27.51%	2.28	21.70%
Deciduous	16.73	48.96%	108.37	89.46%	25.89	91.40%	60.99	64.37%	10.82	72.11%	7.53	71.73%
Developed Impervious	6.29	18.42%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Developed Pervious	4.34	12.70%	2.88	2.38%	0.33	1.16%	0.97	1.02%	0.00	0.00%	0.00	0.00%
Lawn / Landscaping	2.02	5.90%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%
Unmanaged Grassland	3.19	9.33%	0.42	0.35%	0.00	0.00%	0.00	0.00%	0.06	0.38%	0.69	6.57%
Shrub / Transitional Field	0.00	0.00%	0.00	0.00%	0.00	0.00%	7.48	7.89%	0.00	0.00%	0.00	0.00%
Totals	**34.16**	100.0%	**121.13**	100.0%	**28.32**	100.0%	**94.75**	100.0%	**15.00**	100.0%	**10.49**	100.0%

Source: Spectral analysis of Year 2007 NY State Color-Infrared Imagery.

Area A differs substantially in land cover composition from Areas B through F. Forested areas comprise only 53.7 percent of land cover in Area A as compared with over 91 percent forest cover in each of Areas B through F. As shown in Figure 7-1, the balance of the land cover in Area A, i.e., those areas that are not forested, consist mostly of Developed Impervious and Pervious surfaces. The Developed Impervious areas comprise 18.4 percent of the total land cover of Area A, consisting mostly of paved areas (i.e., parking lots and roadways) and, to a lesser degree, structures such as bulk material storage buildings, maintenance shops and offices. Developed Pervious areas, accounting for 12.7 percent of Area A land cover, are typically unpaved lots and storage areas for vehicles and equipment.

Less significant land cover types in Area A include Unmanaged Grassland and Lawn/Landscaping. The Unmanaged Grassland areas, which account for 9.3 percent of the land cover in Area A, are located primarily at the periphery of unpaved lots and bulk material storage areas. Unmanaged Grassland is likely to comprise areas that have been disturbed by storage and maintenance activities on the adjacent paved and unpaved storage lots. Approximately 5.9 percent of Area A consists of Lawn/Landscaping that typically surrounds paved lots, structures and active roadways.

As shown in Figure 7-2, Deciduous forest and, to a much lesser degree, Coniferous forest patches dominate the land surface in Area B, accounting for 97.3 percent of the total land cover. A mere 2.6 percent of the total land cover in this study area consists of Developed Pervious surfaces which are simply unpaved access roads for the high-tension electrical utility corridors. There is also a minimal amount of Unmanaged Grassland, accounting for only 1.1 percent of the total land cover; much of the Unmanaged Grassland is likely former forested areas that were cleared by power line construction activities and that now support native grasses and forbs.

Area C, as depicted in Figure 7-3, is almost 99 percent forested. The vast majority of forest is Deciduous, i.e., 91.4% of total land cover with patches of Conifers occupying 7.44% of the total land cover. Two unpaved roads (or trails) account for the remaining land cover. Classified as Developed Pervious, this land cover class account for only 1.2 percent of the total land cover in Area C. No other land cover types are evident.

The land cover characteristics for Area D (Figure 7-4) are similar to Areas B, C, E and F in that the land surface is dominated by forest. However, in this study area, and particularly in its southern rectangular tract, Conifer stands account for a more significant amount of the forested area, or 26.72% of the total land cover. Area D also contains the largest amount of Coniferous forest (25.3 acres) compared with all other study areas. Area D also supports significant swaths of Shrub/Transitional Field areas. These areas – which will eventually transition to Deciduous forest through the process of succession – account for almost 8 percent of the total land cover in Area D. As in Areas B, C, E and F, unpaved roads and/or exposed-soil trails in Area D account for a minimal percent (about 1%) of the total land cover. These pervious surfaces are evident only in the northern rectangular portion of Area D.

Areas E and F, as depicted in Figure 7-5, are the smallest of the study areas, encompassing only 15.00 and 10.49 acres, respectively, out of the total 303.86-acre project area. Forested areas cover 99.6% of Area E and 93.4% of Area F. The balance of the land cover within Areas E and F consist of Unmanaged Grassland at 0.4% and 6.6% of the total land cover, respectively.

In summary, the overwhelming majority of the land cover within the six Areas A through F is in a natural, undeveloped condition, comprising mostly forested areas and, to a lesser degree, unmanaged grasslands and shrub/transitional fields. Area A is an exception in that almost half (46.4%) of its area is developed, consisting of buildings, paved and unpaved lots, turf and cleared areas.

7.1.2. Water Resources

The project area is located in the region of the Upper Glacial Aquifer, Magothy Aquifer and the Atlantic Ocean/Long Island Sound watershed. This watershed covers marine waters of New York Harbor, Long Island Sound, Block Island Sound and the South Shore of Long Island and includes 1,650 square miles of land, 522 miles of freshwater rivers and streams, 132 freshwater lakes, ponds and reservoirs and 118 miles of Atlantic Ocean coastline.

Wetlands

A review of NYSDEC Wetland Maps, USFWS NWI maps and field surveys in August and September 2010 identified no wetlands or surface waters on or immediately adjacent to Areas B, C and D (Figure 7-6 and Figure 7-7).

The NYSDEC Wetland Map and the United States Fish and Wildlife Service National Wetland Inventory (NWI) Map indicate that palustrine forested (PFO) and palustrine unconsolidated bottom (PUBH) wetlands associated with the Carmans River are located approximately 1000 feet northeast of Area A (Figure 7-6 and Figure 7-7). One of these wetlands, Weeks Pond, is a coastal plain pond described by the New York State Department of Environmental Conservation (NYSDEC) Natural Heritage Program as supporting several state-listed plant species (Appendix E).

Streams

A small intermittent stormwater diversion channel was identified in Area A east of the existing large road salt storage building. Runoff from the east and south drains to the southeastern edge of Area A and flows to a level area behind an earthen berm in the forest. This does not appear to connect with the Carmans

River. Area A is approximately 1000 feet west of the Carmans River and is outside of the 100 year floodplain (Figure 7-8).

The Carmans River is located approximately 1000 feet east from Study Area A and is the closest perennial water body to Study Areas A, B, C, D, E or F. According to the Carmans River Environmental Assessment (Cashin Associates, 2002), the Carmans River is almost entirely fed by shallow groundwater; has been recognized by New York State as a Wild, Scenic and Recreational River; and provides a diversity of wildlife habitat for both aquatic and terrestrial organisms. Baseflow within the Carmans River accounts for almost 100% of the discharge (Rozell, 2010). Groundwater discharge into the Carmans River appears to be from a much larger geographic area than that area suggested by the surface topography and is dominated by baseflow contributions from the shallow Upper Glacial Aquifer as well as the deeper Magothy Aquifer (O'Malley, 2008). Numerous existing sources of nutrients and other contaminants have been identified along the Carmans River including Federal and State Superfund sites, landfill leachate, historic duck farming areas, septic systems, residential lawns, road salt and agriculture (Cashin Associates, 2002; USGS, 1999; O'Malley, 2008).

Water quality data collected by the SCDHS at the USGS gauging station on the Carmans River at Yaphank indicate total nitrogen concentrations are in the 1-2 ppm range (Cashin Associates, 2002; Monti 2003). Intermittent traces of 1,1,1-trichloroethane have also been detected. Total polyaromatic hydrocarbons (PAH) in sediment associated with the Carmans River were reported to range from 345ppb to 744ppb (Zaikowski et al., 2008). Water quality data from the Carmans, Patchogue and Swan Rivers suggest that nutrient levels, temperature and pH were similar (Zaikowski et al., 2008). The Carmans River was significantly less saline than the Patchogue and Swan Rivers. Zaikowski et al. (2008) indicated that the Carmans River experienced significantly less warm season hypoxia as compared with the Patchogue and Swan Rivers. Benthic invertebrate assessment of the Carmans River suggests that the river is non-impacted to slightly impacted according to the biotic index and EPT criteria (Zaikowski et al., 2008). Zaikowski et al. (2008) suggest that the physical attributes of the river are a major factor contributing to warm season hypoxia rather than nutrient levels in the river.

7.1.3. Vegetation

Areas A, B, C, D, E, and F all lie within the pitch pine-oak forest community type within the Coastal Lowlands Ecozone (Reschke 1990). This fire dependent natural community type is part of the broadly defined Pine Barrens Ecosystem. However, the site is not within the regulated Pine Barrens Core or Compatible Growth Areas (Figure 7-9). Although the existing forest types contain a relatively small component of pitch pine, this is likely the result of fire exclusion and land use history and not representative of the suitability of these areas to support "characteristic" pine barrens communities. Specific vegetative diversity identified within each study area during site field visits in August and September 2010 is described in Table 7-3.

Area A contains approximately 34.16 acres within the northeastern parcel of county property (Figure 1-1). The site is bordered by the Long Island Expressway (LIE) to the north, Yaphank Avenue to the west, the Suffolk County Department of Public Works (DPW) complex to the south, and a buffer area along the Carmans River to the east. The northern/interior portion of Area A supports native vegetation while most of the disturbed perimeter habitats support several species of invasive vegetation along with some native plant species. The northern/interior portion of Area A is predominately mixed pitch pine/oak forest. The most dominant species within the forested portion of the property was white oak (*Quercus alba*) followed by pitch pine (*Pinus rigida*), black oak (*Quercus velutina*), blueberry (*Vaccinium pallidum*), huckleberry (*Gaylussacia baccata*) and American holly (*Ilex opaca*). Vegetation identified along disturbed edge areas bordering the highway yards and Yaphank Avenue include black locust (*Robinia pseudoacacia*), red maple (*Acer rubrum*), northern catalpa (*Catalpa speciosa*), multiflora rose (*Rosa multiflora*), autumn olive (*Elaeagnus umbellata*), eastern red cedar (*Juniperus virginiana*), black cherry (*Prunus serotina*), blackberry/bramble (*Rubus* sp.), rough-stemmed goldenrod (*Solidago rugosa*), oriental bittersweet (*Celastrus orbiculata*) and bamboo.

Land use within the majority of Area A includes the Suffolk County highway yards, public works buildings, a large road salt storage building, and vehicle parking. Discontinued traffic lights and traffic poles, approximately twenty (20) barrels of road paint, numerous county vehicles and drainage pipes are scattered

around storage areas within the highway yards. Potential contamination of the soils and water resources is a concern given the lack of containment measures within existing storage areas. Fuel, lubricants and chemicals from the vehicles and paint barrels have the potential to leach into the ground and/or be washed away with storm runoff. The topography of Area A is generally flat to moderately sloped with the gradient gently sloping to the east.

Area B is a 121.13+ acre rectangular parcel south of the County Farm, west of the Police Headquarters and north of the County Correctional Facility Figure 1-1). Species within this mixed pitch pine/oak forest include pitch pine, white oak (dominant), black oak, scrub oak (*Quercus ilicifolia*), post oak (*Quercus stelata*), scarlet oak (*Quercus coccinea*), sassafras, blueberry, huckleberry and bracken fern. The greatest herbaceous diversity is along the power line right-of-way at the southern edge of the parcel. The topography of Area B is generally flat to moderately sloped with the gradient gently sloping to the south.

Area C contains 28.32+ acres immediately south of Area B and west of the County Correctional Facility (Figure 1-1). Species within this mixed pitch pine/oak forest include pitch pine, white oak (dominant), black oak, scrub oak, post oak, scarlet oak, sassafras, blueberry, huckleberry and bracken fern. The greatest herbaceous diversity is along the power line right-of-way at the northern edge of the parcel. The topography of Study Area C is generally flat to moderately sloped with the gradient gently sloping to the south.

Area D is a 94.75+ acre rectangular parcel in the southern portion of the County's holdings along Horseblock Road (Figure 1-1). An active quarry is located immediately to the west and The County Correctional Facility is located to the northeast. The entire parcel is mixed pitch pine/oak forest. The northern portion of Study Area D is dominated by white oak. The southern portion of Study Area D along Horseblock Road is dominated by pitch pine. Other species within Study Area D include black oak, scrub oak, blueberry, huckleberry and bracken fern, sweet fern (*Comptonia peregrina*), Virginia creeper (*Parthenocissus quinquefolia*) and pipsissewa (*Chimaphila maculata*). The greatest vegetative diversity is within the southern portion of Study Area D, along Horseblock Road. A dirt road traverses the center of Study Area D from the northern boundary with

Study Area C to the southern boundary with Horseblock Road. Several side trails branch off the main dirt road in the interior of the study area. The topography of Study Area D is generally flat to moderately sloped with the gradient gently sloping to the south.

Study Area E contains 15.00 acres immediately east of Area D and adjacent to the County Correctional Facility (Figure 1-1). Species within this mixed pitch pine/oak forest include pitch pine, white oak (dominant), black oak, scrub oak, scarlet oak, sassafras, blueberry, huckleberry and bracken fern. The topography of Study Area E is generally flat with the gradient gently sloping to the south.

Study Area F contains 10.49 acres immediately east of Area D and adjacent to the County Correctional Facility (Figure 1-1). Species within this mixed pitch pine/oak forest include pitch pine, white oak, black oak, scrub oak, scarlet oak, sassafras, blueberry, huckleberry and bracken fern. The topography of Study Area F is generally flat with the gradient gently sloping to the south.

Table 7-3: Plant Species Observed from Areas A through F

Common Name	Scientific Name	Invasive	A	B	C	D	E	F
White Oak	*Quercus alba*		X	X	X	X	X	X
Black Oak	*Quercus velutina*		X	X	X	X	X	X
Scrub Oak	*Quercus ilicifolia*			X	X	X	X	X
Post Oak	*Quercus stelata*			X	X			
Scarlet Oak	*Quercus coccinea*			X	X		X	X
Pitch Pine	*Pinus rigida*		X	X	X	X	X	X
Black Locust	*Robinia pseudoacacia*		X					
Red Maple	*Acer rubrum*		X					
Northern Catalpa	*Catalpa speciosa*		X					
Sassafras	*Sassafras albidum*			X	X		X	X
Multiflora Rose	*Rosa multiflora*	X	X					
Autumn Olive	*Elaeagnus umbellata*	X	X					
Eastern Red Cedar	*Juniperus virginiana*		X					
Blueberry	*Vaccinium pallidum*		X	X	X		X	X
Huckleberry	*Gaylussacia baccata*		X	X	X	X	X	X
Bracken Fern	*Pteridium aquilinum*			X	X	X	X	X
Sweet Fern	*Comptonia peregrina*					X		
Virginia Creeper	*Parthenocissus quinquefolia*					X		
Pipsissewa	*Chimaphila maculata*					X		
American Holly	*Ilex opaca*		X					
Black Cherry	*Prunus serotina*		X					
Blackberry/Bramble	*Rubus* sp.		X					
Rough-Stemmed Goldenrod	*Solidago rugosa*		X					

Common Name	Scientific Name	Invasive	A	B	C	D	E	F
Oriental Bittersweet	*Celastrus orbiculata*	X	X					
Bamboo	*Pseudosasa japonica*	X	X					

7.1.4. Wildlife

Wildlife species observed during field surveys included white-tailed deer (*Odocoileus virginianus*), gray squirrel (*Sciurus carolinensis*) and a variety of songbird species. A network of deer trails meanders through the study areas. Mammal and bird species identified from the nearby Brookhaven National Laboratory property that are expected to inhabit similar pitch pine/oak habitats within the study areas include raccoon (*Procyon lotor*), eastern chipmunk (*Tamias striatus*), red fox (*Vulpes fulva*), gray fox, eastern mole (*Scalopus aquaticus*), masked shrew (*Sorex cinereus*), pine vole (*Microrus pinetorum*), white-footed mouse (*Peromyscus leucopus*), southern flying squirrel (*Glaucomys volans*), rufous-sided towhee (*Pipilo erythrophthalmus*), common yellowthroat (*Geothlypis trichas*), field sparrow (*Spizella pusilla*), prairie warbler (*Dendroica discolor*), pine warbler (*Dendroica pinus*), blue jay (*Cyanocitta cristata*) and whip-poor-will (*Caprimulgus vociferus*) (BNL, 1994; Reschke, 1990).

A review of the New York State Department of Environmental Conservation (NYSDEC) Natural Heritage Program database was conducted to describe the occurrence of rare or state-listed animals and plants, significant natural communities, and other significant habitats which occur or may occur on the project site or in the immediate vicinity (Appendix E). No state-listed animals, plants, natural communities, or habitats were identified on the project site. The NYSDEC database identified State-listed plant species from a coastal plain pond approximately 1000 feet northeast of Study Area A and from Yaphank in the town of Brookhaven and State-listed animal species including a skipper species and a dragonfly species from Yaphank in the town of Brookhaven.

The Final Scope for this DGEIS raised the question of whether the gray fox was found on this site. During field studies in support of this investigation, no gray fox were observed within the study area. The gray fox (*Urocyon cinereoargenteus*) typically prefers a mixture of hardwood and pine woodlands with dense understory, rocky areas, old fields bordering extensive forested areas and farmlands. These opportunistic feeders consume primarily small mammals and

insects and they will forage on vegetation including acorns, grapes, apples and berries. The gray fox can climb trees and will make its den in rocky crevices, caves, hollow logs and trees.

The gray fox is not a species listed by the NYDEC as rare, threatened or endangered. This species ranges throughout New York State although little is known about the current status of their population on Long Island. Studies of the gray fox at the nearby Brookhaven National Laboratory have positively identified this species as recently as 2006 (Finn 2005; Mallin 2007; Fallier 2008; BNL 1994; T. Green pers. comm.). In addition, the Town of Brookhaven has observed the gray fox on property located directly across from the police headquarters, east of the Schmidt Farm (McConnell 2010; T. Green pers. comm.). Beyond these observations, little is known about the population of gray fox on Long Island. Long Island is geographically isolated from the rest of New York State and contains habitats and geography unique to the state. It is very unlikely that gray fox or any other wildlife species are able to migrate beyond the limits of the island. Concern has been expressed for the protection of the gray fox on Long Island (McConnell 2010). While there may be merit to this concern, the New York Department of Environmental Conservation (NYDEC) maintains designated trapping and hunting seasons for red fox and gray fox throughout New York State, including Long Island (NYDEC Hunting and Trapping Guide, 2010-2011).

7.2. Potential Impacts of Proposed Project

7.2.1. Land Cover

The proposed project will significantly change land cover within Areas A through F. Table 7-4 summarizes the changes in land cover from the existing conditions to the post-development conditions.

Table 7-4: Summary of Proposed versus Existing Land Cover Classes for Areas A through F

Land Cover Class	Proposed		Existing		Change in Acreage
	Acreage	Percent	Acreage	Percent	
Coniferous Forest	3.53	1.16%	44.88	14.77%	-41.35
Deciduous Forest	42.65	14.04%	230.31	75.80%	-187.66
Developed Impervious	162.09	53.34%	6.29	2.07%	173.26
Developed Pervious	2.05	0.67%	8.52	2.80%	-6.47
Lawn / Landscaping	92.82	30.55%	2.02	0.66%	73.33
Unmanaged Grassland	0.72	0.24%	4.36	1.43%	-3.63

Shrub / Transitional	0.00	0.00%	7.48	2.46%	-7.48
Totals	***303.86***	*100.00%*	***303.86***	*100.00%*	*0.00*

Source: Spectral analysis of Year 2007 NY State Color-Infrared Imagery.

The post-development land cover classification and areal estimates for Areas A through C are based upon an overlay of conceptual plans onto the existing land cover (See Figure 7-10 through Figure 7-12). For Area D – which is located within an industrially-zoned district (L-1) – a conceptual, five-acre subdivision was prepared for the purposes of this analysis; the subdivision (Figure 7-13) depicts the developed area, yards (i.e., rear, front and side), a recharge basin and a roadway. For Areas E through F, it was conservatively assumed that all of the existing land cover would be cleared and replaced with Developed Impervious surfaces. Areas E (15.0 acres) and F (10.49 acres) are located within a partially built-out 271-acre parcel in the A-1 district. It was calculated that Areas E and F – which comprise only 25.49 acres of the entire 271-acre lots (or 9.4% of the total) – may be completed developed with impervious building and paved surfaces.

According to the summary provided in Table 3, Developed Impervious surfaces – occupying 162.09 acres, or 53.34% of the total area of Areas A through F – would comprise the single largest land cover in the proposed project. The second largest land cover class, covering 92.82 acres or 30.55% of all of the study areas, would be Lawn/Landscaping; in addition to grass lawns and athletic fields, this land cover may also comprise landscaping shrubs, flowers and other plants. Together, Developed Impervious and Lawn/Landscaping surfaces could ultimately comprise 254.91 acres (i.e., 83.89 %) of all land cover (303.86 acres) in Areas A through F if the proposed project were completed.

The proposed project would result in a significant loss of trees and other vegetation. Approximately 229.02 acres of forest – consisting of 187.66 acres of Deciduous Forest and 41.35 acres of Coniferous Forest – would be permanently cleared. In addition, all of the approximate 7.48 acres of Shrub/Transitional fields would be removed. Most of the Unmanaged Grassland, or 3.64 of 4.36 total acres, would be converted into Developed Impervious and Lawn/Landscaping surfaces. Most of the Developed Pervious land cover would also be paved or landscaped; only 2.05 acres of Developed Pervious cover would remain, located almost entirely along the utility rights-of-way or trails. The remaining natural areas

would comprise 42.65 acres of Deciduous Forest (14.03% of total project area), 3.53 acres of Coniferous Forest (1.16% of total project area) and 0.72 acres of Unmanaged Grassland (0.24% of total project area).

7.2.2. Water Resources

Wetlands

No wetland areas were identified within study areas A, B, C, D, E or F. Therefore, the proposed plan will not directly impact any wetland resources.

Streams

No streams or surface water features were identified within study areas A, B, C, D, E or F. Therefore, the proposed plan will not directly impact any surface water resources.

Area A is the closest area to a perennial water body (i.e. Carmans River). This area would support a variety of uses including an athletic field, roads, parking areas, buildings, lawns and landscaping. The proposed structures, including mixed-use commercial and residential buildings and an arena, would occupy approximately 6.0 acres of the area. Additional area would be utilized for parking and turfgrass.

The project proposed within Area A will result in a net increase in impervious surfaces and turfgrass. The area of impervious surfaces within Long Island watersheds has been documented to have a negative effect on fish and aquatic invertebrates within the stream (Ayers et al., 2000). Increased road density and parking areas may require increased use of deicing agents such as road salt and increased turfgrass and landscaped areas may require increased use of fertilizers. O'Malley (2008) reported a direct correlation between the density of roads and the concentration of both sodium and chloride ions in the Carmans River. The proposed development within Study Area A will also result in an increased water demand which will likely be met through additional withdrawal of groundwater by the municipal supplier. Increases in groundwater withdrawal within the Carmans River groundwater basin could negatively impact the hydrology of the river since the hydrology of the river is almost entirely dominated by baseflow

(Rozell, 2010). Additionally, installation of sanitary sewers and stormwater conveyances could alter flow patterns of shallow groundwater. Conversely, the increase in impervious cover within Study Area A could result in increased surface runoff to the river. Surface runoff from developed areas is often associated with increased levels of nutrients, sediment and other contaminants.

However, it should be noted that existing conditions within Study Area A may also contribute negatively to the water quality within the Carmans River. Current uses within the majority of Area A include 10 acres of County highway yards, 13,000 square feet of public works buildings, a 16,600 square foot road salt storage building, a 90 vehicle parking area and a doctor's cottage and shed. Discontinued traffic lights and traffic poles, road paint, county vehicles and drainage pipes are stored within the County highway yard. Therefore, existing uses within Area A also have potential for contamination of soils and shallow groundwater.

Areas B, C, D, E and F are greater than 1 mile from the Carmans River but within the estimated groundwater contributing area. The proposed development within Area B includes mixed income residential housing and a day care center. The proposed development within Study Area C includes athletic fields and trails. The proposed development within Area D includes light industrial and alternative energy production facilities. The proposed development within Areas E and F includes relocation of the Suffolk County Department of Public Works facilities from Area A and expansion of the County's wastewater treatment facility. Although distant from the Carmans River, the proposed developments could negatively affect both water quality and quantity within the river due to decreased groundwater recharge, increased groundwater withdrawal, introduction of contaminants into shallow groundwater from surface runoff and increased use of fertilizers and deicing materials.

7.2.3. Vegetation

The proposed project will result in the clearing and conversion of existing forest land to other cover types. The surface area of the Carmans River watershed is approximately 22,700 acres with 6,064 acres (27%) currently preserved. The Town of Brookhaven contains approximately 42,989 acres (26%) of recreational

and open space area (Suffolk County Department of Planning, 2007). According to U.S. Forest Service statistics, the area of forest land within Suffolk County, NY increased from 123,300 acres in 1980 to 182,600 acres in 1993 (Considine and Frieswyk, 1982; Alerich and Drake, 1994). This trend is similar to trends observed throughout the last half of the 20th century in the eastern U.S. as agricultural lands were abandoned and reverted to forest land (Houghton and Hacker, 2000). U.S. Geological Survey (USGS) land cover data indicate a decrease in forest land within the broader Atlantic Coastal Pine Barrens Ecoregion from 1,107,502 acres (4482 km2) in 1973 to 1,021,511 acres (4134 km2) in 2000 (Drummond and Loveland, 2010). It is unclear if the USGS data trends also apply specifically to Suffolk County or the Carmans River watershed.

Installation of buildings, roads and associated infrastructure would increase the fragmentation of habitats for plants and animals and would encourage the establishment of invasive plant species. Forest fragmentation can reduce the movements of wildlife species and limit the amount of genetic diversity within populations. The forest fragmentation would favor "edge" species at the expense of forest interior dwelling species.

7.2.4. Wildlife

The loss of upland, woodland habitat resulting from the proposed project is the most potentially significant impact to wildlife populations and species in the area. The proposed project would clear or disturb approximately 75% of the existing forest within Study Areas A, B, C, D, E and F and most of the shrub/transition fields and unmanaged grasslands. The total area of developed/impervious and lawn/landscaped surfaces would increase. As a result of the overall development plan, a small amount of natural habitat will remain for wildlife to inhabit. Resident wildlife populations would be expected to disperse from the project area and into adjacent natural areas during construction of the proposed project. The loss of natural habitat within the project areas may discourage the return of certain wildlife species. Those species most adapted to suburban habitats, fragmented natural habitats and human activity would be expected to return to the study areas and reestablish populations within the altered landscape.

7.3. Mitigation Measures

7.3.1. Water Resources

Wetlands

No wetland areas will be impacted as a result of the proposed development.

Streams

No streams or surface water features will be directly impacted as a result of the proposed development. Due to the correlation between land use and water quality in the Carmans River, the proposed development activities could potentially affect the quality and quantity of baseflow discharge into the Carmans River. Potential mitigation measures may include limitations on impervious surfaces, preparation of a Stormwater Pollution Prevention Plan (SWPPP), construction of stormwater retention facilities to promote infiltration of surface runoff from impervious surfaces, construction of pre-treatment cells or wetlands to promote the removal of contaminants from stormwater runoff, restrictions on the use of fertilizers and pesticides in the proposed landscaping and turfgrass areas and limitations on the type and use of deicing materials.

The proposed stormwater treatment design will allow for the detention and infiltration of up to 8 inches of precipitation from impervious surfaces within the proposed development. The use of fertilizers and pesticides on turfgrass areas would be mitigated by recently adopted regulations discussed in Section 5.3. Additionally, since the County currently owns the site of the proposed project, these limitations on fertilizer and pesticide use effectively limit the application of pesticides and fertilizer on the property. The County intends to continue this practice on this land following its sale as a condition of sale. Therefore, these stringent requirements will apply in perpetuity to the land purchased by the Selected Developer.

The proposed project would result in increased withdrawal of groundwater from the Upper Glacial and Magothy aquifers. According to the SCWA their wells are an interconnected system and water to serve this project could be supplied through dozens of wells, both existing and new, if needed. Some of these existing

wells are screened in the Upper Glacial aquifer and some are screened in the Magothy aquifer. If new wells are needed, the decision on where the wells are screened is based upon water quality and that decision cannot be made until the location of the well is known. According to the SCWA, the proposed withdrawal from this project would not be anticipated to have a significant effect on baseflow to the Carmans River due to the size of the watershed recharging the aquifer and the fact that the water supply would be from an interconnected system that draws from a large area and from both aquifers. In addition, the wastewater generated by the project will be treated and discharged to groundwater, thus maintaining the water table over the long term. Therefore, additional groundwater withdrawals resulting from the project will be mitigated by utilizing multiple supply aquifers and discharging treated wastewater back to groundwater.

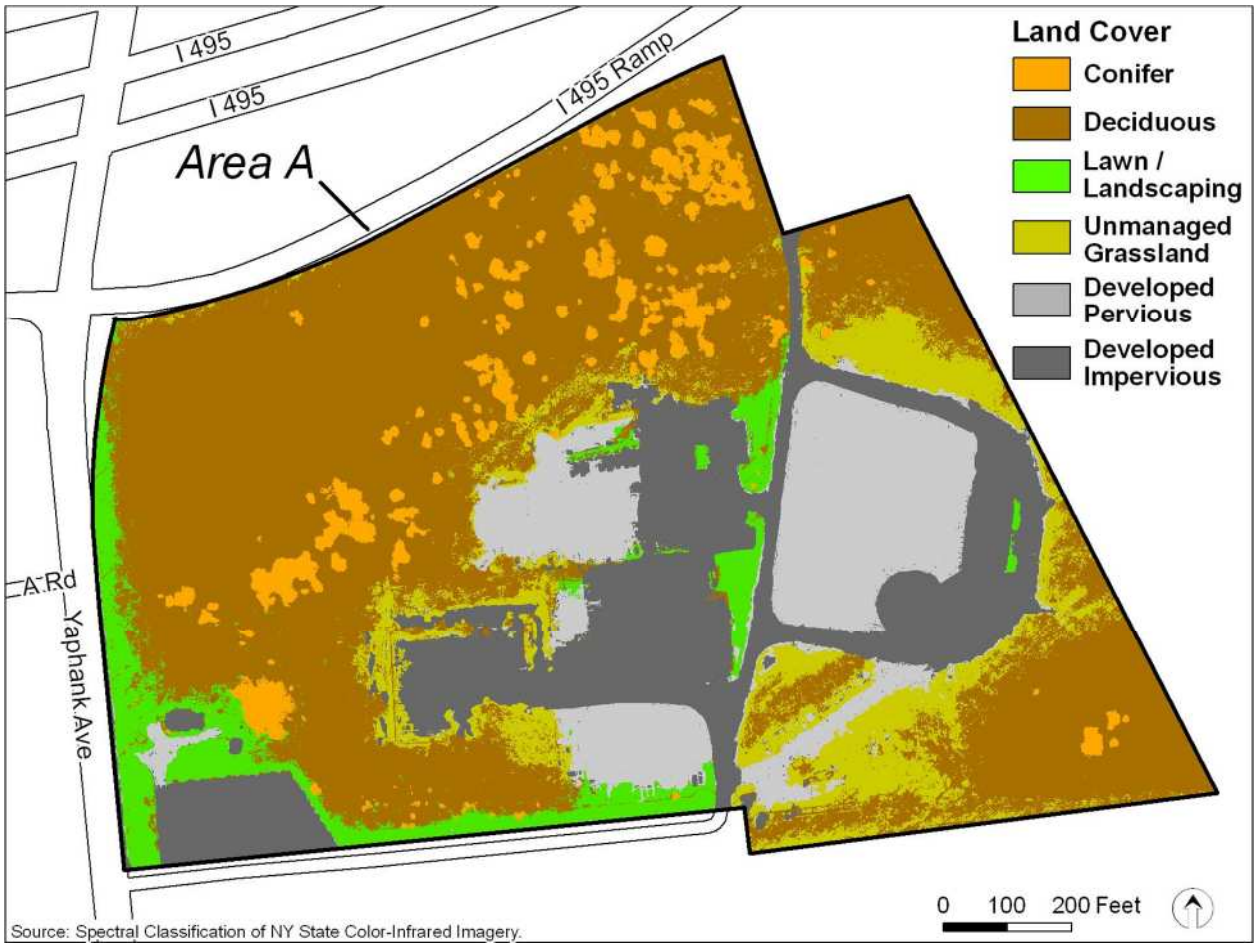
Additional mitigation measures may include the use of water conservation practices, limits on irrigation of turfgrass areas and installation of water conserving fixtures in residential and commercial facilities.

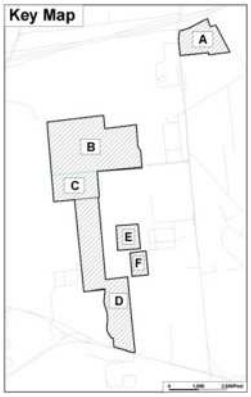
7.3.2. Vegetation

Removal of the native forest cover type could be partially mitigated through the use of native tree and shrub species in the proposed landscaping. Native grassland species could be substituted instead of maintained turfgrass. Additionally, specific project designs could strive to minimize the clearing of forest areas through cluster development or modifications to densities.

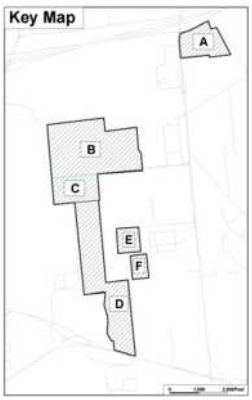
7.3.3. Wildlife

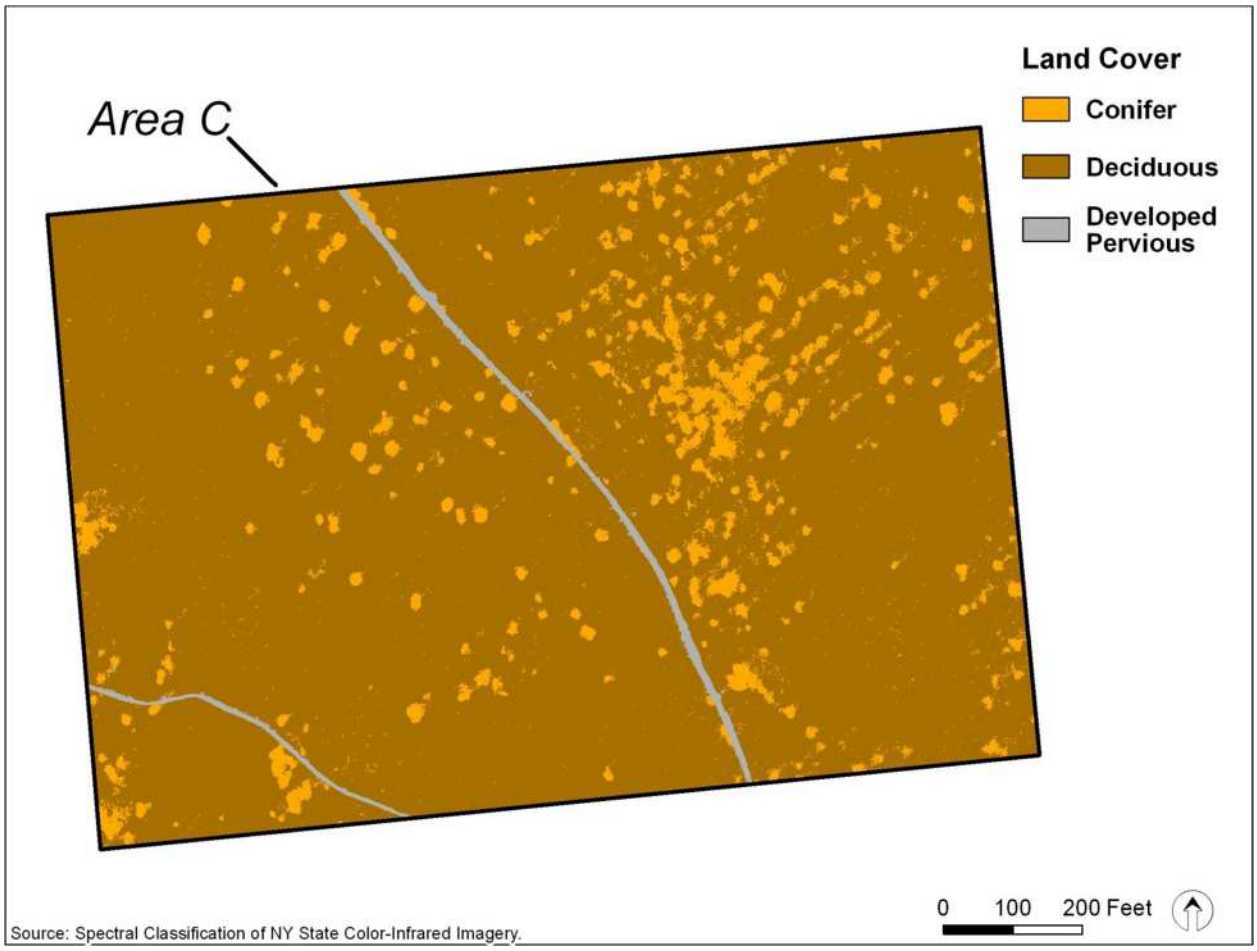
Maximizing the preservation of existing forest will mitigate the impacts on native wildlife populations. Specific project designs should strive to maintain travel corridors and contiguous habitat. The use of native tree, shrub and grassland species will promote re-colonization of the developed areas by wildlife species.

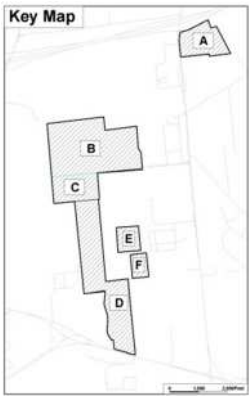

I 495
I 495
I 495 Ramp
Area A
A Rd
Yaphank Ave
Land Cover
Conifer
Deciduous
Lawn / Landscaping
Unmanaged Grassland
Developed Pervious
Developed Impervious
0 100 200 Feet
Source: Spectral Classification of NY State Color-Infrared Imagery.

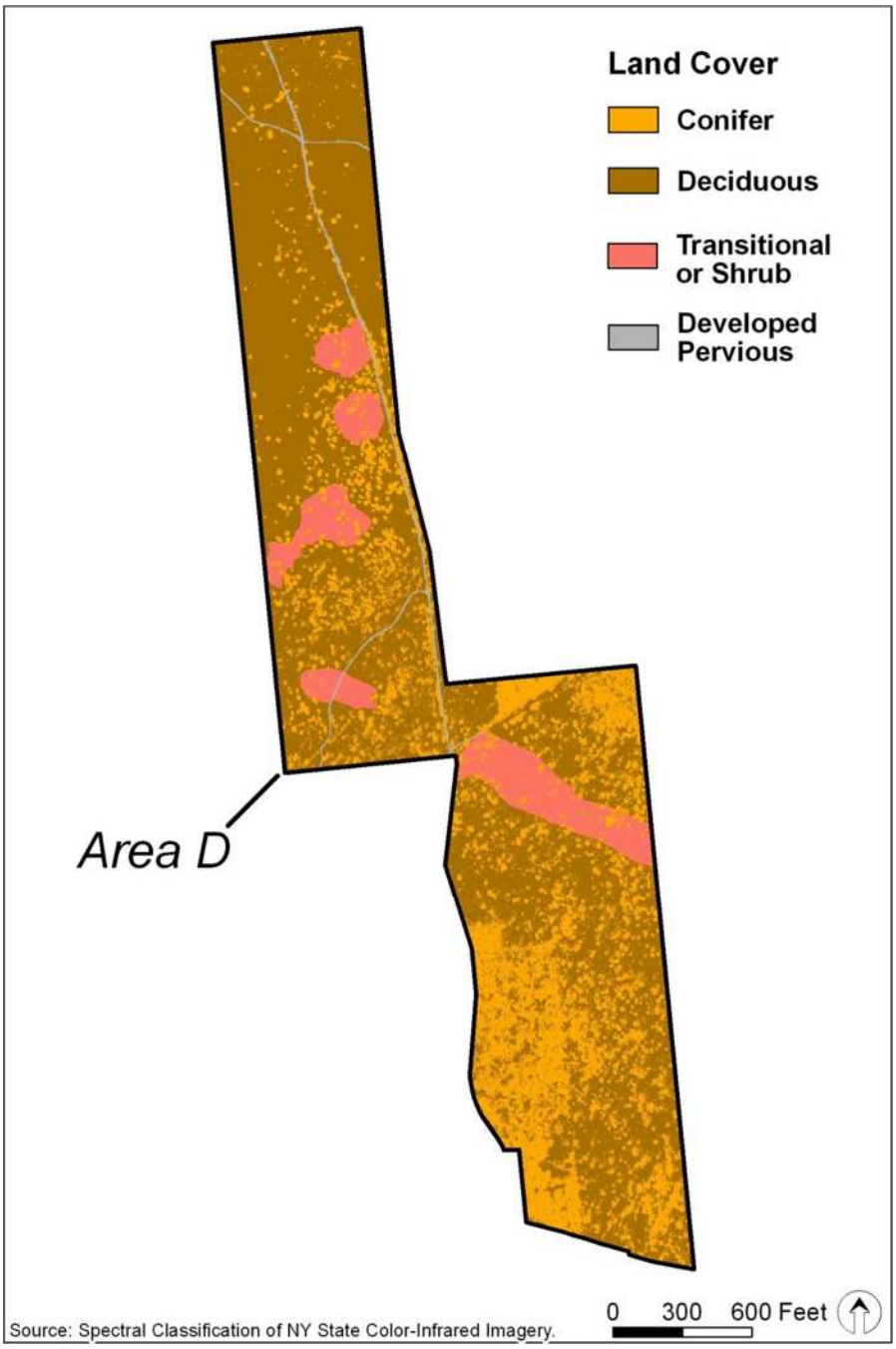

Key Map
A
B
C
E
F
D

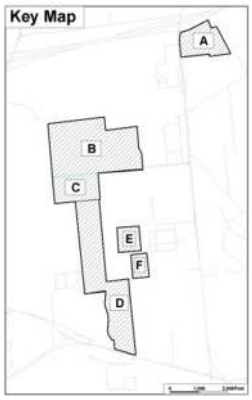

Land Cover
Conifer
Deciduous
Unmanaged Grassland
Developed Pervious
Area B
State St
Glover Dr
0 200 400 Feet
Source: Spectral Classification of NY State Color-Infrared Imagery.

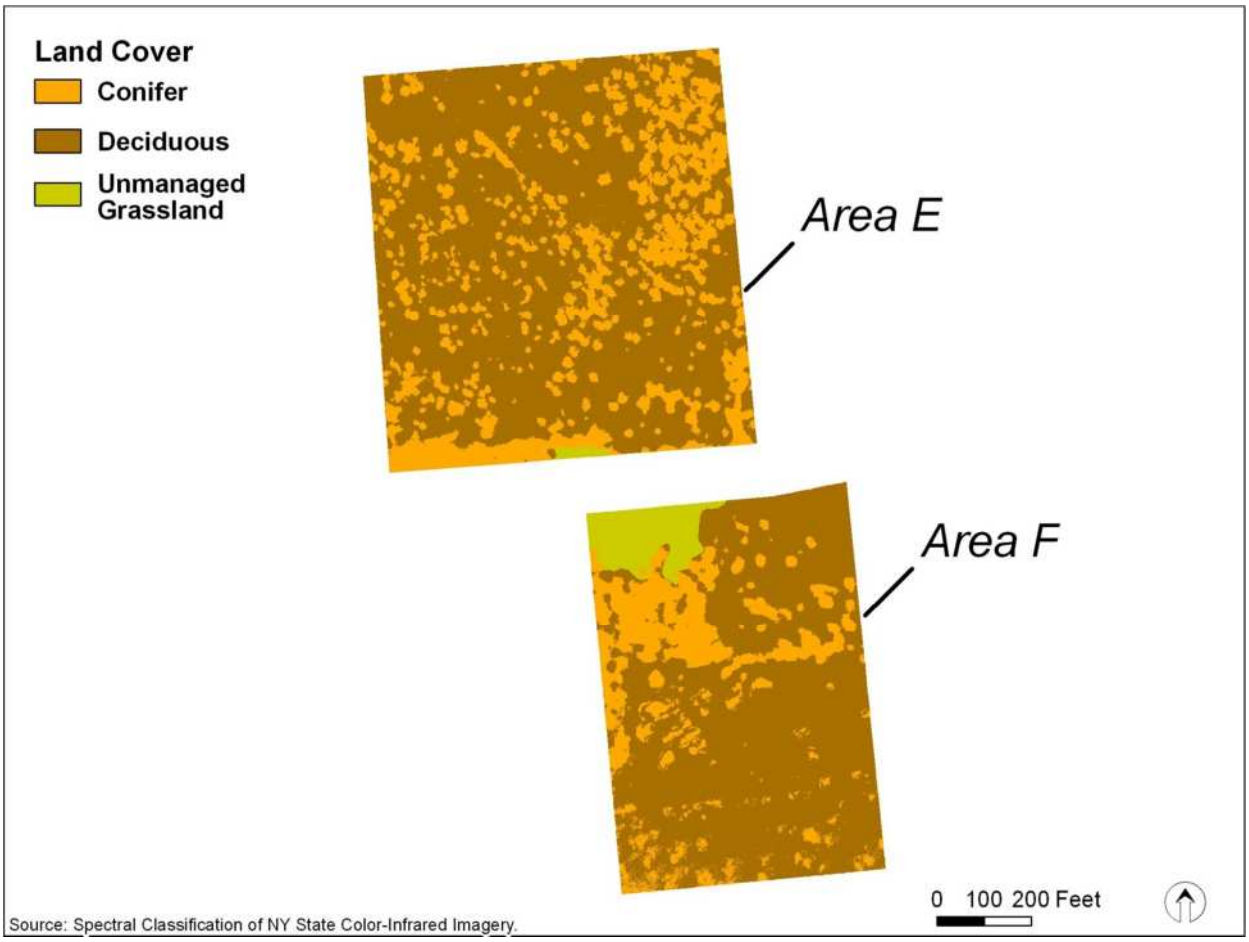

Key Map
A
B
C
E
F
D

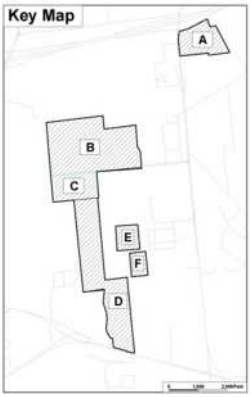

Area C
Land Cover
Conifer
Deciduous
Developed Pervious
0 100 200 Feet
Source: Spectral Classification of NY State Color-Infrared Imagery.

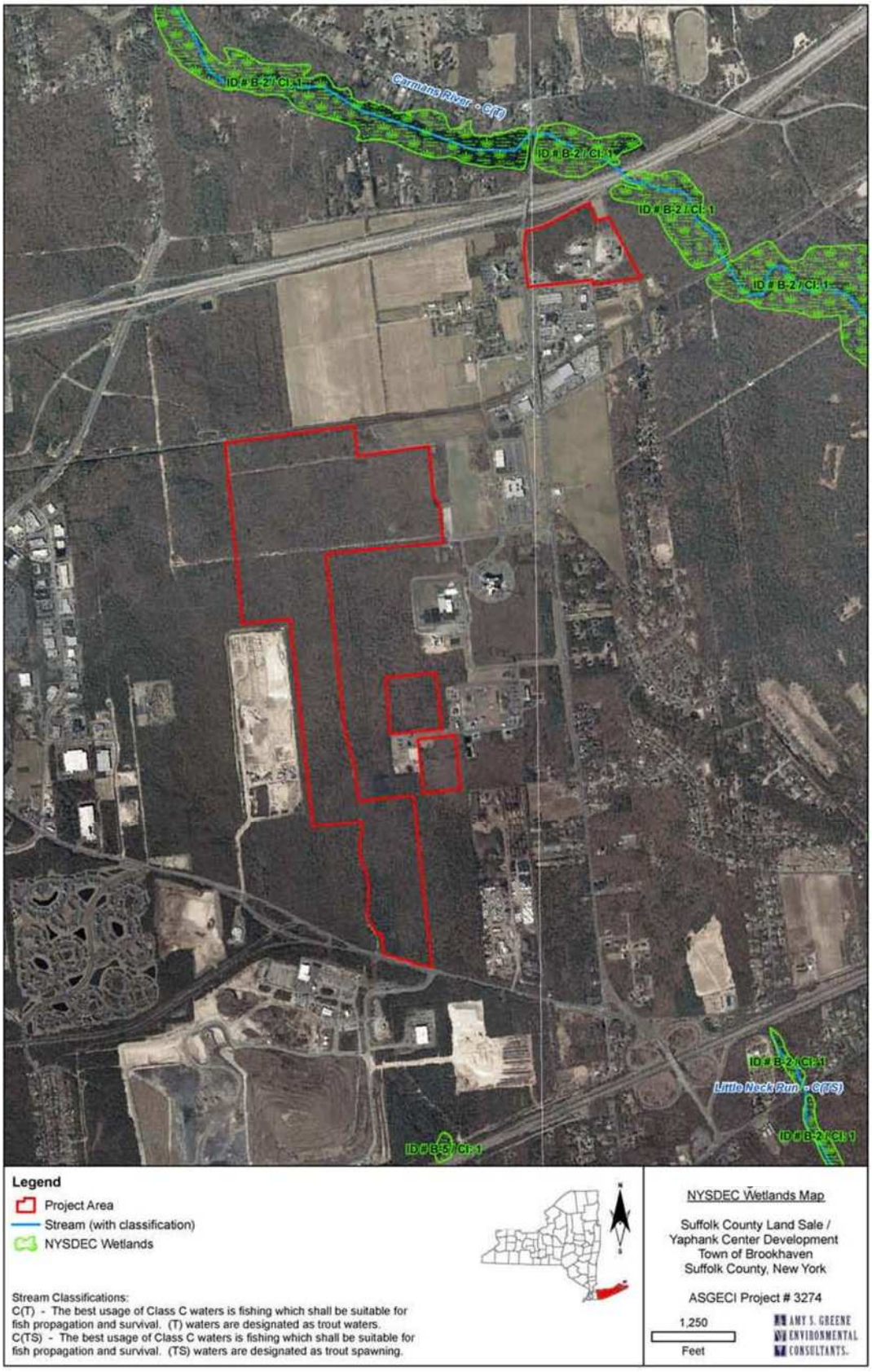

Key Map
A
B
C
E
F
D

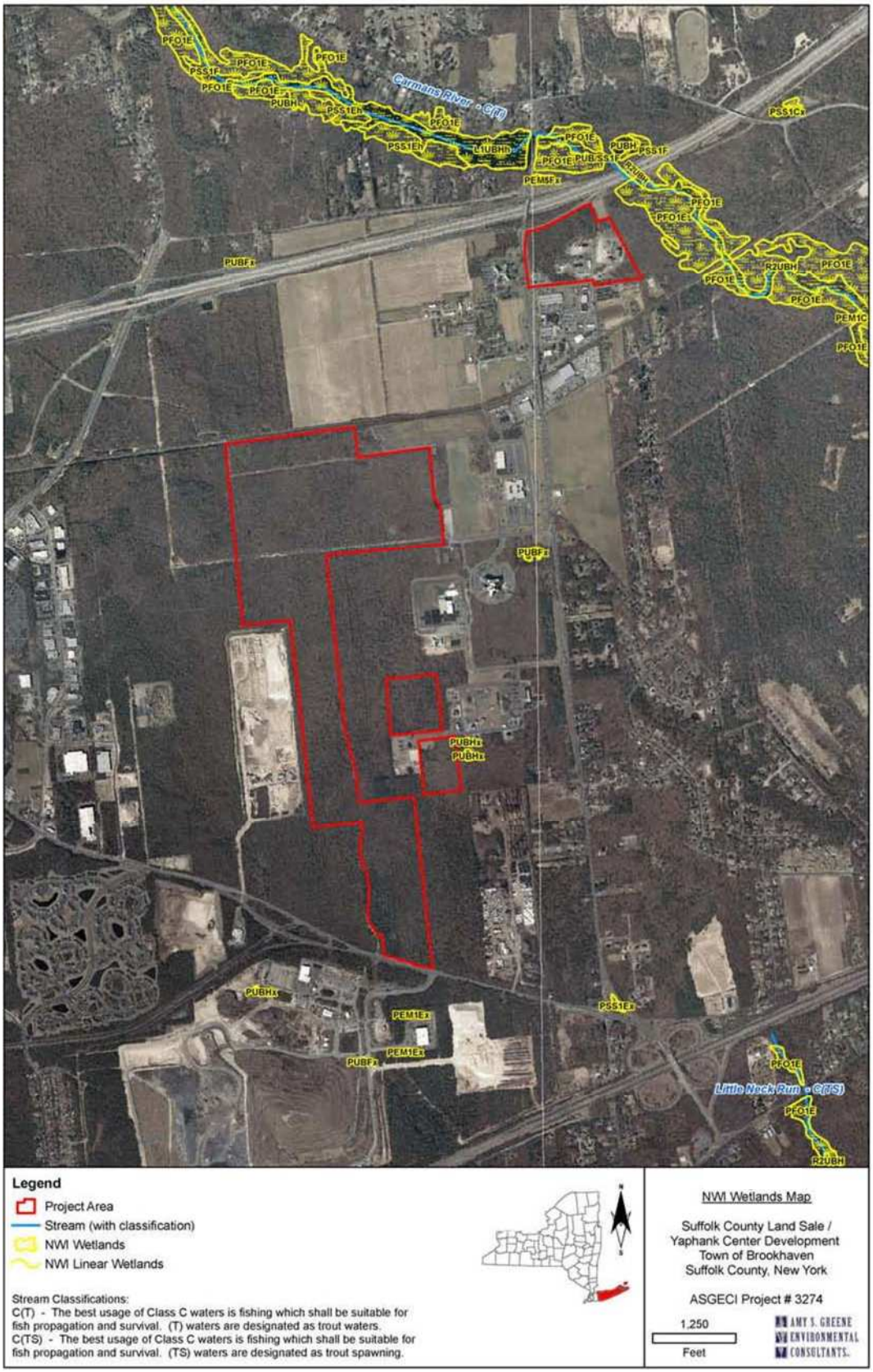

Land Cover
Conifer
Deciduous
Transitional or Shrub
Developed Pervious
Area D
Source: Spectral Classification of NY State Color-Infrared Imagery.
0 300 600 Feet

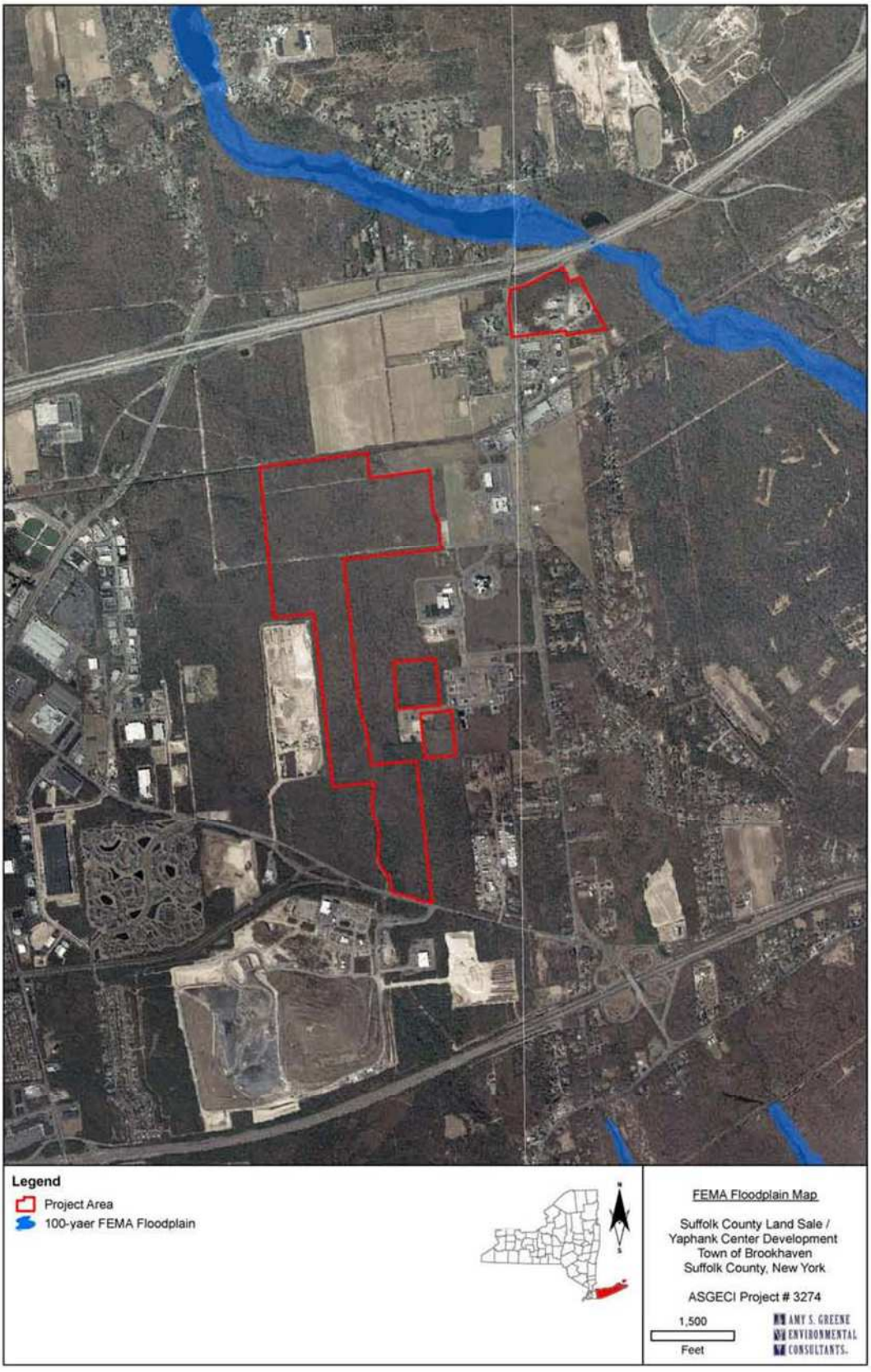

Key Map
A
B
C
D
E
F

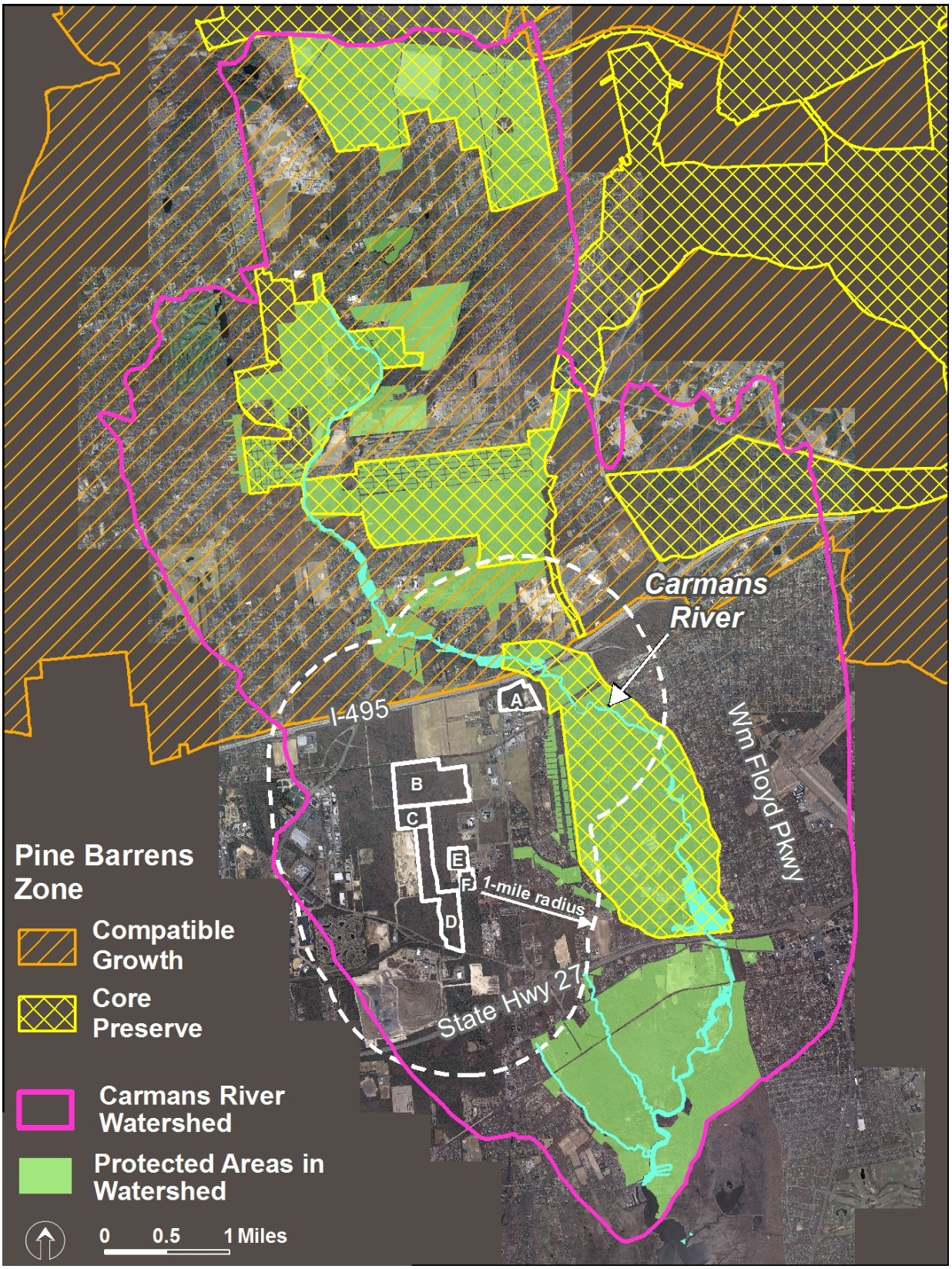

Land Cover
Conifer
Deciduous
Unmanaged Grassland
Area E
Area F
0 100 200 Feet
Source: Spectral Classification of NY State Color-Infrared Imagery.

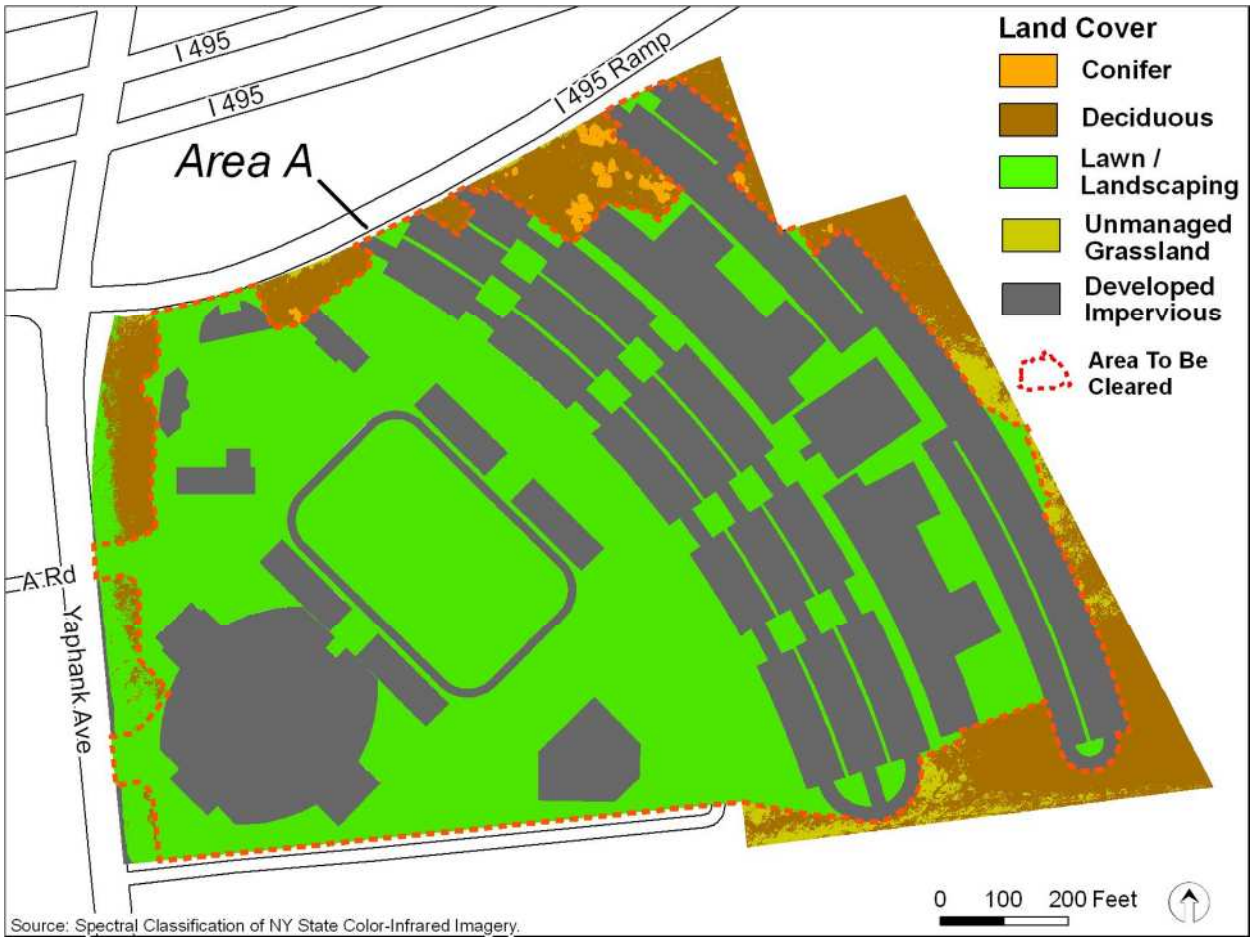

Key Map
A
B
C
E
F
D

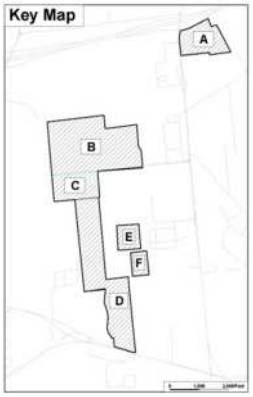

ID # B-2 / CL: 1
Carmans River - C(T)
ID # B-2 / CL: 1
ID # B-2 / CL: 1
ID # B-2 / CL: 1
ID # B-2 / CL: 1
Little Neck Pond - C(TS)
ID # B-2 / CL: 1
ID # B-5 / CL: 1
Legend
Project Area
Stream (with classification)
NYSDEC Wetlands
Stream Classifications:
C(T) - The best usage of Class C waters is fishing which shall be suitable for fish propagation and survival. (T) waters are designated as trout waters.
C(TS) - The best usage of Class C waters is fishing which shall be suitable for fish propagation and survival. (TS) waters are designated as trout spawning.
NYSDEC Wetlands Map
Suffolk County Land Sale / Yaphank Center Development
Town of Brookhaven
Suffolk County, New York
ASGECI Project # 3274
1,250
Feet
AMY S. GREENE ENVIRONMENTAL CONSULTANTS.


Carmans River - C(T)
Little Neck Run - C(TS)
PFO1E
PSS1F
PUBH
PSS1Ex
L1UBHh
PEM5Fx
PSS1Cx
R2UBH
PEM1C
PUBFx
PUBHx
PEM1Ex
PSS1Ex
Legend
Project Area
Stream (with classification)
NWI Wetlands
NWI Linear Wetlands
Stream Classifications:
C(T) - The best usage of Class C waters is fishing which shall be suitable for fish propagation and survival. (T) waters are designated as trout waters.
C(TS) - The best usage of Class C waters is fishing which shall be suitable for fish propagation and survival. (TS) waters are designated as trout spawning.
NWI Wetlands Map
Suffolk County Land Sale / Yaphank Center Development
Town of Brookhaven
Suffolk County, New York
ASGECI Project # 3274
1,250
Feet
AMY S. GREENE ENVIRONMENTAL CONSULTANTS.

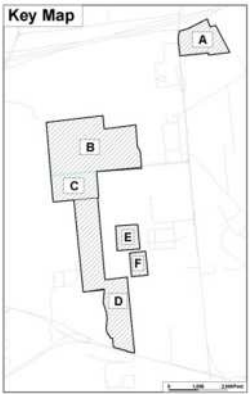

Legend
Project Area
100-yaer FEMA Floodplain
FEMA Floodplain Map
Suffolk County Land Sale /
Yaphank Center Development
Town of Brookhaven
Suffolk County, New York
ASGECI Project # 3274
1,500
Feet
AMY S. GREENE
ENVIRONMENTAL
CONSULTANTS.


Carmans River
I-495
Wm Floyd Pkwy
State Hwy 27
1-mile radius
A
B
C
D
E
F
Pine Barrens Zone
Compatible Growth
Core Preserve
Carmans River Watershed
Protected Areas in Watershed
0 0.5 1 Miles

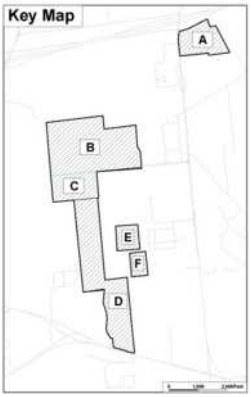

I 495
I 495
I 495 Ramp
Area A
A Rd
Yaphank Ave
Land Cover
Conifer
Deciduous
Lawn / Landscaping
Unmanaged Grassland
Developed Impervious
Area To Be Cleared
0 100 200 Feet
Source: Spectral Classification of NY State Color-Infrared Imagery.

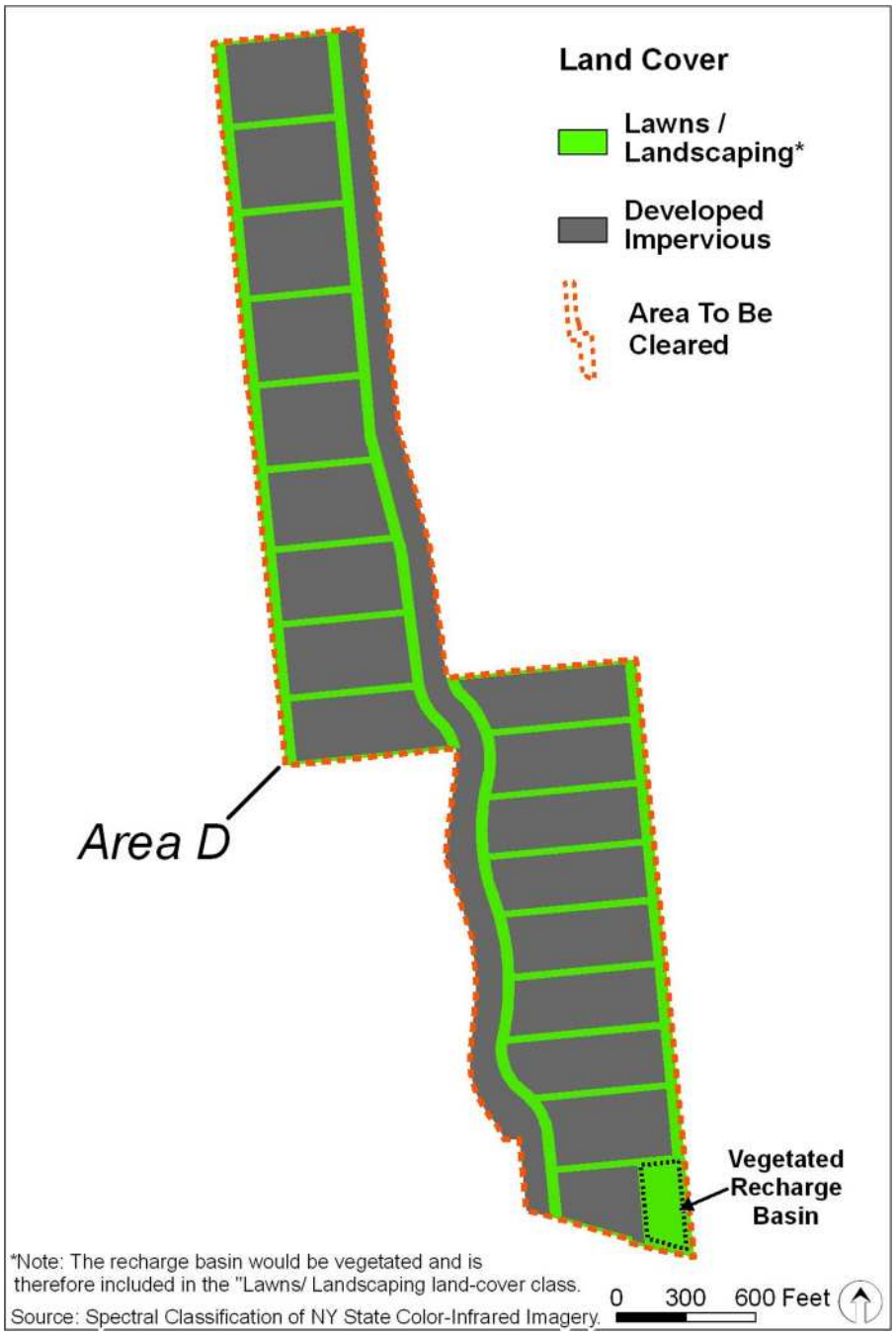

Key Map
A
B
C
E
F
D

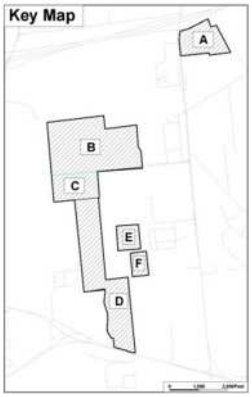

Land Cover
Conifer
Deciduous
Lawn / Landscaping
Unmanaged Grassland
Developed Impervious*
Developed Pervious
Area To Be Cleared
State St
Area B
Lake
Glover Dr
*Note: The lake area is defined as impervious due to the requirement for an impermeable liner.
Source: Spectral Classification of NY State Color-Infrared Imagery.
0 200 400 Feet


Key Map
A
B
C
E
F
D


Land Cover
Conifer
Deciduous
Lawns / AthleticTurf
Unmanaged Grassland
Developed Impervious
Developed Pervious
Area To Be Cleared
Area C
0 100 200 Feet
Source: Developer's proposal.


Key Map
A
B
C
D
E
F


Land Cover
Lawns / Landscaping*
Developed Impervious
Area To Be Cleared
Area D
Vegetated Recharge Basin
*Note: The recharge basin would be vegetated and is therefore included in the "Lawns/ Landscaping land-cover class.
Source: Spectral Classification of NY State Color-Infrared Imagery.
0 300 600 Feet


Key Map
A
B
C
D
E
F