

APPENDIX B

BIOLOGICAL INVESTIGATION
AND
RELATED CORRESPONDANCE FROM THE
NYS NATURAL HERITAGE PROGRAM

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BIOLOGICAL EVALUATION

WARWICK VIEWS, LLC

Blooms Corners Road

Town of Warwick, Orange County, NY

Site description:

This site has recently been an active farm with many hay fields and several barns. The on site evidence seems to indicate that large animals such as horses or cattle were on this site. A series of open fields are located in the lower two thirds of the site, extending in a northwesterly direction from the property boundary along Blooms Corners Road, on each side of an open meadow wetland area. The northwesterly portion of the site is rather steep and is heavily wooded in a hardwood forest of various classifications.

The site is 249.9 acres. The roadway frontage is at an approximate elevation of 530, sloping in a northwesterly direction to the wetland corridor which runs across the site at an elevation of 456. The land then slopes gently through several grassy meadows (former agricultural fields) to an approximate elevation of 470. At the rear of the meadows, and a portion of the grassy wetland in the northeasterly portion of the site, the land slopes rather steeply to an ultimate elevation of 540.

The proposed site development will develop 75 acres in single family housing along a winding roadway system that begins on Blooms Corner Road, and that provides for a future connection on the adjoining land to the south. Wildlife corridors are provided for in the subdivision layout, one through the continuation of the wetland PI 21 for a distance of approximately 400 feet, and a second between proposed lots 38 and 39. In addition, a 100 foot wide utility easement for a gas main runs through the length of the site from Blooms Corners Road to the northwesterly end of the property, which also provides for a wildlife corridor.

The ecological communities that exist on this site are all common and this site reflects hundreds of years of human impacts. All the more level or gently sloping land on this property shows signs of being utilized for agriculture.

The forest here is composed mostly of early successional, light-loving species (hickories, oaks, elm, tulip poplar, etc) and contains old stonewalls, abandoned lanes, etc. The largest, oldest trees on this site are red and white oaks that may have seeded into the open, sunny, ridges about seventy-five years ago.

The wetlands here occur in valleys with slow, seeping streams. These areas may have been pastureland long ago but are now reed canary grass (*Phalaris arundinacea*) meadows. These wetlands are of rather low ecological value and will remain undisturbed.

The soils nearby this site are well suited for agriculture, so farming, no doubt, began early in the history of this region and remained a primary activity here until not long ago. As expected, this site displays many of the characteristics of a long past history of intensive use including activities such as mining, logging, burning, grazing, plowing, etc. Agricultural practices seem to have been continued here until a few years ago, and there remains some good quality hay fields, an extensive system of stonewalls, abandoned farm lanes and dirt roads. As a result, this land is characterized by early successional species and is missing many of the more fragile species that that could not withstand nearly 300 years of continuous disturbance. The principal vegetative types on this property are primarily successional old fields, and an Appalachian oak hickory forest.

Methods

In general, the methodology suggested in Hudsonia's Biodiversity Assessment Manual has been followed. Existing material in the form of topographical maps, soil surveys, biological literature relevant to the Hudson Highlands region, etc. was reviewed and analyzed. An inquiry was sent to the New York Natural Heritage program (NYNHP) requesting records of rare communities and species in the vicinity and the U.S. Fish & Wildlife Service web site for Orange County was investigated for their list of threatened or endangered species.. From this, predictions were made regarding the occurrence of significant habitats.

The Southern Wallkill Biodiversity Plan project premises and goals were evaluated as to their applicability to the proposed residential project. The Bloom Corners Swamp and adjacent wetlands runs through this property, from south to north, and is a classified NYSDEC protected wetlands, with the required 100 foot wide adjacent area, as a minimum, protected from development.

Field reconnaissance was conducted on May 29, 2007 noting geological features, vegetation structure, plant species, and abundance, animals, human impacts, etc. To describe the dominant plant communities, the criteria followed were those established in "***Ecological Communities of New York State***" by Carol Reschke produced by the New York Natural Heritage Program and the New York State Department of Environmental Conservation, January 2002.

The site visit was conducted in late May when the various plant and animal species of concern could be expected to be easily recognizable. No evidence of any endangered or threatened plant or animal species was found here.

Results

This property contains five ecologically distinct communities identified in "*Ecological Communities of New York State*" by Reschke. The following is a description of these communities with the specific compositional variations that occur on this property.

Community Type Successional Old Field

Heritage Ranking G5 S4

Location:

The former fields are located generally across the site from southwest to northeast bordering the freshwater wetlands that run across the site in the lower third of the land.

Description

This ecological community is a meadow dominated by forbs and grasses that occurs on sites that have been cleared and plowed (for farming or development) and then abandoned. Characteristic herbs found here include goldenrods (*Solidago altissima*, *S. nemoralis*, *S. rugosa*, *S. Canadensis* and *Euthamia graminifolia*). These fields are composed primarily of introduced, tame grasses, timothy (*Phleum pratense*), orchard grass (*Dactylis glomerata*) Reed canary grass (*Phalaris arundinacea*) with a mixture of common chickweed (*Cerastium arvense*), old-field cinquefoil (*Potentilla simplex*), Queen Ann's lace (*Daucus corota*), ragweed (*Ambrosia artemisiifolia*), hawkweeds *Hieracium spp.*. As farming has declined and the fields were mowed or grazed on an irregular basis, the quality of the hay has deteriorated and the fields were invaded by wildflowers and other herbaceous plants.

Community type. Hemlock northern hardwood forest

Rank: G4 S2S3

Location

Upper slopes along the steeper portions of the site in the northeasterly part of the site, in steep terrain that abuts the wetland in the northeasterly corner of the site and which extends to the property boundary in that vicinity.

Description:

Hemlock-northern hardwood forest: a mixed forest that typically occurs on middle to lower slopes of ravines, on cool, mid-elevation slopes, and on moist, well-drained sites at the margins of swamps.

In any one stand, hemlock (*Tsuga canadensis*) is codominant with anyone to three of the following: beech (*Fagus grandifolia*), sugar maple (*Acer saccharum*), red maple (*A. rubrum*),

black cherry (*Prunus serotina*), white pine (*Pinus strobus*), yellow birch (*Betula alleghaniensis*), black birch (*B. lenta*), red oak (*Quercus rubra*), and basswood (*Tilia americana*). The relative cover of hemlock is quite variable in ravines to as little as 20% of the canopy cover. Striped maple (*Acer pensylvanicum*) is often prominent as a mid-story tree.

The shrub layer may be sparse; characteristic shrubs are hobblebush (*Viburnum lantanoides*), mapleleafviburnum (*Viburnum acerifolium*), and raspberries (*Rubus* spp.). In some ravines, especially in the southern part of the state, rosebay (*Rhododendron maximum*) forms a dense subcanopy or tall shrub layer. Canopy cover can be quite dense, resulting in low light intensities on the forest floor and hence a relatively sparse groundlayer.

Characteristic groundlayer plants are Indian cucumber-root (*Medeola virginiana*), Canada mayflower (*Maianthemum canadense*), shining clubmoss (*Lycopodium lucidulum*), common wood fern (*Dryopteris intermedia*), mountain wood fern (*Dryopteris campyloptera*), christmas fern (*Polystichum acrostichoides*), star flower (*Trientalis borealis*), bellwort (*Uvularia sessilifolia*), common wood-sorrel (*Oxalis acetosella*), partridge berry (*Mitchella repens*), foamflower (*Tiarella cordifolia*), round-leaf violet (*Viola rotundifolia*), twisted stalk (*Streptopus roseus*), purple trillium (*Trillium erectum*), and the moss *Leucobryum glaucum*. In forests that have beech as codominant, beech-drops (*Epifagus virginiana*) is a common herb.

Characteristic birds include wild turkey (*Meleagris gallopavo*), pileated woodpecker (*Dryocopus pileatus*), golden-crowned kinglet (*Regulus satrapa*), blackthroated green warbler (*Dendroica virens*), and Acadian flycatcher (*Empidonax virescens*).

This is a broadly defined and very widespread community, with many regional and edaphic variants. For example, in the Hudson Valley, hemlock is sometimes codominant with red oak; in the Adirondacks, yellow birch and sugar maple are sometimes codominant, with a relatively small number of hemlocks as well as a few red spruce (*Picea rubens*).

Community Type Appalachian Oak-Hickory Forest

Heritage Ranking G4G5 S4

Location

This ecological community occurs on the well-drained, upland sites in the northwesterly portion of the upland forest adjoining the meadows.

Description

Appalachian oak-hickory forest: a hardwood forest that occurs on well-drained sites, usually on ridgetops, upper slopes, or south- and west-facing slopes. The soils are usually loams or sandy loams. This is a broadly defined forest community with several regional and edaphic variants.

The dominant trees include one or more of the following oaks: red oak (*Quercus rubra*), white oak (*Q. alba*), and black oak (*Q. velutina*). Mixed with the oaks, usually at lower densities, are one or more of the following hickories: pignut (*Carya glabra*), shagbark (*C. ovata*), and sweet pignut (*C. ovalis*). Common associates are white ash (*Fraxinus americana*), red maple (*Acer rubrum*), and Eastern hop hornbeam (*Ostrya virginiana*).

The trees on this site consist of a fairly mature forest, with the larger hickories and oaks being up to 36 inches in caliper, and approximately 60 feet in height. The overall tree canopy on this site reaches to a fairly even 60 feet in height throughout the major trees.

There is typically a subcanopy stratum of small trees and tall shrubs including flowering dogwood (*Cornus florida*), witch hazel (*Hamamelis virginiana*), shadbush (*Amelanchier arborea*), and choke cherry (*Prunus virginiana*). Common low shrubs include maple-leaf viburnum (*Viburnum acerifolium*), blueberries (*Vaccinium angustifolium*, *V. pallidum*), red raspberry (*Rubus idaeus*), gray dogwood (*Cornus foemina* ssp. *racemosa*), and beaked hazelnut (*Corylus cornuta*). The shrublayer and groundlayer flora may be diverse, although on this site there is little understory due to the heavy overstory of the more mature trees.

Characteristic groundlayer herbs are wild sarsaparilla (*Aralia nudicaulis*), false Solomon's seal (*Smilacina racemosa*), Pennsylvania sedge (*Carex pensylvanica*), tick-trefoil (*Desmodium glutinosum*, *D. paniculatum*), black cohosh (*Cimicifuga racemosa*), rattlesnake root (*Prenanthes alba*), white goldenrod (*Solidago bicolor*), and hepatica (*Hepatica americana*).

Characteristic birds in addition to those animals described below include red-bellied woodpecker (*Melanerpes carolinus*), whip-poor-will (*Caprimulgus vociferus*), and wild turkey (*Meleagris gallopavo*).

Distribution: throughout upstate New York north of the Coastal Lowlands ecozone; most common south of the Adirondacks ecozone.

Community Type Intermittent Stream

Heritage Ranking G4 S4

Location

These ecological communities occur near the center of the property forming part of the wetland corridor. There are several very poorly defined shallow drainage areas within the several wetland areas that could be classified as intermittent streams.

Description

This community typically is a small, ephemeral streambed with a moderate to steep gradient, where water flows only during the spring or after a heavy rain. Its flora and fauna varies as it flows through forest or grassland and is limited to species that do not require a

permanent supply of running water, or that inhabit the streambed only during the rainy season. The streambed, at times may be covered with mosses.

Community Type Shallow Emergent Marsh

Heritage Ranking G5 S5

Location

The entire freshwater wetland on this site is thus classified. This ecological community occurs through the lower third of the site and which extends from the southwest property line through to the northeast property line across the entire site. Much of this area may have been farmed fields in the past. A forested "island" lies in the middle of this wetland habitat which has a Appalachian Oak-Hickory habitat, and which rises to approximately 14 feet above the adjoining wetland.

Description

This is a marsh meadow community that occurs on mineral soil that is permanently saturated to near the surface and may be seasonally flooded. This marsh is better drained than a deep emergent marsh, water depths may vary from 6 inches to nothing during flood stages, but the water level usually drops by mid to late summer and the substrate is exposed during the average year.

This wetland community is a shrub/emergent meadow composed primarily of reed canary grass (*Phalaris arundinacea*), silky dogwood (*Cornus Amomum*), purple loosestrife (*Lythrum salicaria*), etc. with some multiflora rose (*Rosa multiflora*), Poison ivy (*Rhus toxicodendron*), Goldenrods (*Solidago spp*) on the drier spots. This is not a deep emergent wetland or other high quality wetland that would sustain significant populations of fish, amphibians, reptiles or waterfowl in need of protection.

Most abundant herbaceous plants include bluejoint grass (*Calamagrostis canadensis*), cattails (*Typha latifolia*, *T. angustifolia*, *T. x glauca*), sedges (*Carex spp.*), marsh fern (*Thelypteris palustris*), manna grasses, (*Glyceria pallida.*, *G. canadensis*), spikerushes (*Eleocharis smalliana*, *E. obtusa*), bulrushes (*Scirpus cyperinus*, *S. tabernaemontani*, *S. atrovirens*), threeway sedge (*Dulichium arundianceum*), sweetflag (*Acorus americanus*), tall meadow-rue (*Thalictrum virginicum*), goldenrod (*Solidago rugosa*, *S. gigantean*), eupatoriums (*Eupatorium maculatum*, *E. perfoliatum*), smartweeds (*Polygonum coccineum*), marsh bedstraw (*Galium palustre*), Jewelweed (*Impatiens capensis*), loosestrifes (*Lysimachia thrysiflora*, *L. terristris*, *L. cilliata*). Frequently in degraded sites, as in this instance, reed canarygrass (*Phalaris arundinacea*) and/or purple loosestrife (*Lythrum salicaria*) become abundant.

This shallow emergent marsh includes scattered shrubs including rough alder (*Alnus incana spp rugosa*), water willow (*Decodon verticillatus*), shrubby dogwoods (*Cornus amomum*,

C. sericea), willows (*Salix spp.*) meadow sweet (*Spiraea alba var. latifolia*) and buttonbush (*Cephalanthus occidentalis*).

Wetland Crossing and Impact on Wildlife

The Southern Walkkill Biodiversity Plan, Prepared by the Metropolitan Conservation Alliance, MCA Technical Paper Series No. 8, discusses the importance of maintaining a diversity of habitats along a specific watercourse. An important issue in current site development is that of preserving and providing wildlife corridors along watercourses through an area of site development, and which includes areas that are currently in agriculture.

The current proposal does provide a substantial amount of undisturbed wildlife habitat, both wetland and upland habitat through the site.

As part of this development, a road is proposed to cross a portion of the wetland corridor. This small crossing is not expected to impact wildlife in any significant way because the type of wetland occurring here is not of high wildlife value. The shrub meadow is composed primarily of reed canary grass (*Phalaris arundinacea*), silky dogwood (*Cornus Amomum*), purple loosestrife (*Lythrum salicaria*), etc. with some multiflora rose (*Rosa multiflora*), Poison ivy (*Rhus toxicodendron*), Goldenrods (*Solidago spp*) on the drier spots. This is not a deep emergent wetland or other high quality wetland that would sustain significant populations of fish, amphibians, reptiles or waterfowl in need of protection. In fact, the only wildlife species seen or recorded near this wetland were deer, raccoons and American toads (*Bufo americanus*). To moderate the impact to such amphibians, reptiles and small mammals that may occur here, this roadway crossing will be constructed with sloping curbs and a 2' by 4' concrete box culvert will be installed under the roadway. Overall, this small crossing is expected to have very little impact on wildlife.

Woodland Wildlife

In general, the wildlife found on this property is typical of a region dominated by woodlands dissected by a mosaic of disturbed habitats such as mowed lawns, roadways, pathways, transmission line corridors and human development. Most animal species show a preference for certain habitats and may be more likely to be found within the vegetative communities described above but they move within and between these communities as they seek food, shelter, or mates. The animal species listed here were confirmed present by direct observation, calls or evidence such as tracks, droppings, molted feathers, skeletal remains, etc. Certainly other species are present both as permanent residents and migrants. The confirmed species are not extraordinary in any way but rather represent typical species of disturbed habitats with a lot of the edge effect that characterizes this property. This edge effect is evident wherever there are wooded areas of various ages, abutting roadways, lawns, wetlands, ponds, intermittent streams, etc.

The largest mammals on this site are white-tailed deer, raccoons, and woodchucks. Sightings, tracks, droppings or other sign confirmed their presence. The deer population here seems about average for this area, several were sighted and some sign was noted. Smaller mammals confirmed present are cottontail rabbit, chipmunk, gray squirrel, and white-footed mice. Most likely present but not recorded would be the meadow vole, short-tailed shrew, jumping mouse, long-tailed weasel, opossum, red and gray fox, muskrat, and others, but they were not confirmed present.

The largest birds confirmed present were wild turkey, red tailed hawk, Turkey vulture and crow. Common bird species confirmed on this property were, red-bellied woodpecker, downy woodpecker, red-winged blackbird, song sparrow, cardinal, blue jay, catbird, mockingbird, ovenbird, Carolina wren, phoebe, white breasted nuthatch and starling. Species expected to occur here but not seen or confirmed present are included in the attached list of species confirmed or expected.

Reptiles and amphibians are probably not well represented on this property, in fact only a few young American toads were seen. There is little standing or running water here, no ponds, permanent streams or vernal pools. The wetlands here are not deep and dry out in most years. No fish were found here and probably do not occur here. The protected wetlands here may possibly be breeding and overwintering areas for amphibians such as wood frogs, green frogs and spring peepers. These wetlands are protected and will remain undisturbed.

A site investigation was conducted on May 29, 2007 for the purpose of investigating the possible presence of Indiana Bat habitat, (*Myotis sodalists*) and of possible Bog Turtle, (*Clemmys muhlenbergii*) habitat within or near the subject site.

The NYSDEC and the USFWS has identified these species as endangered in New York State, and, specifically, Orange County.

Indiana Bat

The Indiana bat is one of nine bat species found in New York. With the coming of spring, Indiana bats disperse from their winter homes, known as hibernacula, some going hundreds of miles. Indiana bat hibernacula and hibernacula characteristics have been well documented by numerous observational studies reported in the literature. Indiana bats spend the winter months in secluded caves or mines. There are eight hibernacula currently known in Albany, Essex, Warren, Jefferson, Onondaga and Ulster Counties. To date there are three known hibernacula located in the immediate vicinity of Kingston, New York. The hibernacula are critical to the survival of this species because so few are known to exist. The USFWS and NYSDEC are continually documenting habitat utilization by this species once emergence occurs. In August or early September, Indiana bats swarm at the entrance of selected caves or mines. This is when mating takes place. Indiana bats spend the winter months in these secluded caves or mines which average 37 to 43 degrees F. Criteria for selecting hibernacula are not clearly understood; many apparently suitable sites are not occupied. Where this species is found, however, it can be extremely abundant, congregating in densities of more than 300/square foot.

Year after year, bats often return to exactly the same spots within individual caves or mines. Hibernation can begin as early as September and extend nearly to June.

Outside the hibernation period, Indiana bats are very mobile and use both live trees greater than 5 inches dbh especially containing dead wood and snags or dead trees in a variety of habitats for roosts during the summer months. They feed solely on flying insects during the summer months, and presumably males spend the summer preparing for the breeding season and winter that follows. Females congregate in nursery colonies, only a handful of which have ever been discovered. These nursery colonies found in the lower Hudson Valley vicinity were located near sources of open water, along the banks of streams or lakes in forested habitat, or adjacent to freshwater wetland areas, under the loose bark of mature shagbark hickory trees, and in some cases, in dead trees, mainly black locusts, that have open or hanging bark to provide shelter for the bats, and which can contain from 50-100 females. Although roosts have been documented in a wide array of hardwood and pine species, trees and snags that have exfoliating bark or crevices, such as Shagbark Hickory and Black Locust, appear to be most important to this species because females and their young rest under the bark. Trees, equal to or greater than 9 inches dbh with exfoliating bark and/or crevices, southern or western exposure, and solar exposure (tree structure above canopy) appear to be the most important habitat for maternal colonies during the summer months. In summer, most reproductive females occupy roost sites under the exfoliating bark of dead trees that retain large, thick slabs of peeling bark. Primary roosts usually receive direct sunlight for more than half the day. Roost trees are typically within canopy gaps in a forest, in a fenceline, or along a wooded edge. Habitats in which maternity roosts occur include riparian zones, bottomland and floodplain habitats, wooded wetlands, and upland communities. Indiana bats typically forage in semi-open to closed (open understory) forested habitats, forest edges, and riparian areas.

According to the literature, roost-tree density necessary to support Indiana bats is not understood and negative or positive biological thresholds linked to roost abundance are unknown. Similarly, there are no quantitative studies that adequately describe species composition of forest stands or stand structure surrounding occupied roosts. There is evidence however that Indiana bats return to the same summer foraging and roosting areas and sometimes to an individual tree each year.

Bog Turtle

The bog turtle is New York's smallest turtle, reaching a maximum length of 4.5 inches. It is one of seventeen species of turtles found in New York State, including marine turtles. The secretive bog turtles are the smallest species in the Genus *Clemmys*, with the maximum length not exceeding 4.5 inches. The carapace is domed and from light brown to ebony, with scutes often having lighter-colored centers in a starburst pattern. The distinguishing feature is a large, conspicuous, bright orange, yellow, or red blotch on each side of the head. This blotch is present from birth in both sexes.

The Bog Turtle normal habitat extends from New York and Massachusetts south to southern Tennessee and Georgia. This is a semi-aquatic species, preferring habitat with cool, shallow, slow-moving water, deep soft muck soils, and tussock-forming herbaceous vegetation.

In New York, the bog turtle is generally found in open, early successional types of habitats such as wet meadows or open calcareous boggy areas generally dominated by sedges (*Carex spp.*) or sphagnum moss. Like other cold-blooded or ectothermic species, it requires habitats with a good deal of solar penetration for basking and nesting. According to a variety of sources, Bog Turtles' preferred habitat includes shallow, spring-fed fens, sphagnum bogs, swamps, marshy wet meadows with soft, muddy, organic bottoms, slow moving water, and open canopies bordered by shrub and red maple swamps. Plant species found in association with bog turtles include shrubby cinquefoil (*Potentilla fruticosa*), sedges (*Carex spp.*, especially *Carex stricta*), sphagnum moss (*Sphagnum spp.*), and skunk cabbage (*Symplocarpus foetidus*). The turtles frequently lay eggs atop tussock sedges in areas with open canopies and sparse shrub vegetation that would not shade the nests.

According to NYSDEC and the Natural Heritage Program (2003) optimal habitat (in New York) has the following attributes:

- <25% canopy cover;
- Headwater or spring head water sources;
- Muddy substrate;
- Shallow, uneroded rivulets;
- Cinquefoil, sedges, rushes, sphagnum moss;
- No obvious threats or evidence of negative impacts to wetland in the past.

Habitat suitability declines as canopy cover increases and threats and impacts to the wetland increase in severity or proximity. Degraded water quality, due to siltation and eutrophication, is a primary threat to the turtles, as well as successional processes that lead to closed canopies, human influenced habitat changes, and collecting.

HABITAT ASSESSMENT/CONCLUSION

Bog Turtle - The Phase 1 Bog Turtle habitat suitability assessment followed the protocols outlined by the Fish and Wildlife Service (2001)¹.

The project area and immediately adjacent observable areas were reviewed to determine if suitable hydrology, soils, and vegetative structure that constitute bog turtle habitat occurs on the site.

This emergent wetland area did not contain cattail and generic tussock sedge sometimes linked to bog turtle reproduction. These wetland areas were extensively evaluated and determined not to be potential bog turtle habitat as no fen indicator species were observed and

¹ US Fish and Wildlife Service 2001. Bog Turtle (*Clemmys muhlenbergii*) Northern Population, Recovery Plan. Hadley, Massachusetts

the hydrology and substrate material were too variable or unstable to support bog turtle specimens. The remaining wetlands on the property are generally densely canopied and do not possess stable hydrology for bog turtles.

Indiana Bat

The property was also surveyed for the presence of Indiana Bat summer roost and maternal colony habitat. This assessment included field observation of the existing habitat cover types on the property. Field surveys were conducted using multiple methods as multiple methodologies increase the potential accuracy of surveys.

1. Establish sampling routes throughout the property in areas that provide the necessary environmental conditions for summer habitat, to cover all of the identified vegetation cover types.
2. Established sampling routes throughout the site (transects) were walked and trees greater than 9 inches dbh were investigated. Trees meeting the above criteria were examined to determine their suitability to support Indiana Bats such as exfoliating bark, holes, cavities, and crevices.
3. General conditions of surrounding habitat were also reviewed to determine tree location, size, and position in habitat.

The property is considered to possess potential habitat in the vicinity upslope from the northeasterly portion of the uplands adjoining the wetland for the Indiana Bat. There were several shagbark hickories of from 8 to 12 inches in caliper in the slopes next to the wetlands. It is understood that to avoid direct impacts to individual Indiana Bats removal of trees for construction activities or within building envelopes will occur during the time period from October 1 to March 30. No further mitigation is proposed for the Indiana Bat.

Biodiversity Evaluation:

The fact that 174 acres of the overall 249 acre site is being maintained in its existing state, that of former agricultural fields with wooded fencerows and an open meadow wetland, a significant amount of habitat for many of the woodland, open meadow and wetland species will remain undisturbed from their present state. As mentioned in the Southern Wallkill Biodiversity Plan, a significant amount of land beyond that protected by the NYSDEC wetland regulations will remain for continued wildlife habitat. This Blooms Corners swamp and adjacent wetlands habitat extends for a considerable distance offsite in each direction which habitat is protected and will remain a viable habitat for the existing aquatic and wetland species.

The existing wetland habitat which will remain will continue to provide for the variety of amphibians and birds that currently utilize the site and the open meadows (former agricultural fields) in the protected upland areas that will remain will continue to provide for habitat for the upland species – birds and mammals.

The two forested habitats on this site in the northeasterly and northwesterly portions of the site will have some residential development through the middle portion of the site, along the north side of the gas main easement. A significant portion of the Hemlock northern hardwood forest to the south of the gas main easement will remain entirely undisturbed. This woodland habitat extends offsite for a significant distance on adjoining lands. The present habitats for wildlife in this area will not be disturbed at all, and the gas easement presently provides an open buffer of sorts along the northern edge of this forest type. A portion of the Appalachian Oak-Hickory Forest to the north of the proposed development will remain undisturbed. This area presently abuts a significant amount of similar forest land to the north which will continue to provide a significant amount of undisturbed native wildlife habitat in the overall area.

Note that, in the case of deer, woodchucks, and other ground mammal species, the presence of delicious home landscaping does not deter those species from visiting and inhabiting residential areas that exist near their former undisturbed woodland. The issue of biodiversity is thus encouraged in these cases.

The former agricultural lands which will now remain in the central portion of the site are an evolving habitat, in that an evolving mix of forbs, shrubs and trees will become established, thus providing a continuing evolution of habitat types to benefit the birdlife as well as the smaller mammals that would otherwise not exist in open fields.

The Town of Wallkill, adopted Southern Wallkill biodiversity Plan, suggests the type of site planning that is an integral part of this project. The provision of several wildlife habitat corridors, the passage of a significant box culvert under the access road in the wetland crossing area and the provision of almost three quarters of the site as a protected conservation area are all significant benefits to the maintenance of a viable wildlife and vegetative habitat in the immediate area.

Species Lists

The following plants and animals were found present on one or more areas of the property. Other species are present but not represented because they are not evident at the time of day and season that this survey was conducted. This is especially true of migratory birds, nocturnal animals, herbaceous plants, etc. In some cases identification was not possible for many plants where the key elements of flower fruit or leaf were not available. Also attached is a list of wildlife species expected to occur at a site such as this.

TREES

American beech	<i>Fagus grandifolia</i>
American elm	<i>Ulmus americana</i>
Apple	<i>Pyrus malus</i>
Ash	<i>Fraxinus pensylvanica</i> or <i>nigra</i>
Bigtooth aspen	<i>Populus grandidentata</i>
Bird cherry	<i>Prunus avium</i>

Bitternut hickory	<i>Carya cordiformis</i>
Black birch	<i>Betula lenta</i>
Black gum	<i>Nyssa sylvatica</i>
Black cherry	<i>Prunus serotina</i>
Black locust	<i>Robinia pseudo-acacia</i>
Black oak	<i>Quercus velutina</i>
Black walnut	<i>Juglans nigra</i>
Black willow	<i>Salix nigra</i>
Chestnut oak	<i>Quercus montana</i>
Choke cherry	<i>Prunus sp.</i>
Elm	<i>Ulmus sp.</i>
Gray birch	<i>Betula populifolia</i>
Hop-hornbeam	<i>Ostrya virginiana</i>
Hornbeam	<i>Carpinus caroliniana</i>
Norway Maple	<i>Acer platinoides</i>
Pignut hickory	<i>Carya glabra</i>
Pin oak	<i>Quercus palustris</i>
Quaking aspen	<i>Populus tremuloides</i>
Red cedar	<i>Juniperus virginiana</i>
Red maple	<i>Acer rubrum</i>
Red oak	<i>Quercus rubra</i>
Sassafras	<i>Sassafras albidum</i>
Scarlet oak	<i>Quercus coccinea</i>
Shadbush	<i>Amelanchier sp.</i>
Shagbark hickory	<i>Carya ovata</i>
Sugar maple	<i>Acer saccharum</i>
Swamp white oak	<i>Quercus bicolor</i>
Tulip tree	<i>Liriodendron tulipifera</i>
White ash	<i>Fraxinus americana</i>
White oak	<i>Quercus alba</i>
Willow	<i>Salix sp.</i>

SHRUBS AND VINES

Arrow-wood	<i>Viburnum dentatum</i>
Barberry	<i>Berberis thunbergii</i>
Bittersweet	<i>Celastrus scandens</i>

Blueberry	Vaccinium sp.
Buckthorn	Rhamnus cathartica
Elderberry	Sambucus canadensis
Flowering dogwood	Cornus florida
Grape	Vitis sp.
Greenbrier	Smilax sp.
Honeysuckle	Lonicera sp.
Maple leaf Viburnum	Viburnum acerifolium
Multiflora rose	Rosa multiflora
Nannyberry	Viburnum lentago
Perwinkle	Vinca sp
Poison ivy	Rhus toxicodendron
Silky dogwood	Cornus Amomum
Smooth sumac	Rhus glabra
Spice bush	Lindera benzoin
Staghorn sumac	Rhus typhina
Sweet pepperbush	Clethra alnifolia
Virginia creeper	Parthenocissus quinquefolia
Wild grape	Vitis sp.
Winterberry	Ilex verticillata
Witch hazel	Hamamelis virginana

HERBACEOUS PLANTS

Asters	Aster sp.
Blackberry	Rubus sp.
Blue vervain	Verbena hastata
Burdock	Arctium sp.
Canada Mayflower	Maianthemum canadense
Celandine	Chelidonium majus
Christmas fern	Polystichum acrostichoides
Clovers	Trifolium spp.
Common mullein	Verbascum Thapsus
Crested wood-fern	Dryopteris cristata
Curly dock	Rumex crispus
Dandelion	Taraxacum officinale
Duckweed	Lemna major

Evening primrose	<i>Oenothera</i> sp.
Hawkweed	<i>Hieracium aurantiacum</i>
Garlic mustard	<i>Alliaria officinalis</i>
Goldenrods	<i>Solidago</i> spp.
Grasses	Family Gramineae (Poaceae)
Japanese knotweed	<i>Polygonum cuspidatum</i>
Jewelweed	<i>Impatiens</i> sp.
Narrow leaf plantain	<i>Plantago lanceolata</i>
Orchard Grass	<i>Dactylis glomerata</i>
Pokeweed	<i>Phytolacca americana</i>
Porcupine sedge	<i>Carex histrichina</i>
Purple loosestrife	<i>Lythrum Salicaria</i>
Queen-Ann's-Lace	<i>Daucus carota</i>
Raspberry	<i>Rubus occidentalis</i>
Rough fruited cinquefoil	<i>Potentilla recta</i>
Rush	<i>Juncus brachycarpus</i>
Sedges	<i>Carex</i> spp.
Sensitive fern	<i>Onoclea sensibilis</i>
Skunk cabbage	<i>Symplocarpus foetidus</i>
Smartweed	<i>Polygonum hydropiper</i>
Spinulose wood-fern	<i>Dryopteris spinulosa</i>
Sweet clover	<i>Trifolium repens</i>
Tearthumb	<i>Polygonum sagittatum</i>
Thistle	<i>Cirsium</i> sp.
Timothy	<i>Phleum pratense</i>
Trout Lilly	<i>Erythronium americanum</i>
Tussock sedge	<i>Carex stricta</i>
Violet	<i>Viola</i> sp
White woodland aster	<i>Aster divaricatus</i>
Wild geranium	<i>Geranium maculatum</i>
Wild leek	<i>Allium tricoccum</i>
Wild onion	<i>Allium</i> sp.
Willow herb	<i>Epilobium</i> sp.
Yarrow	<i>Achillea millefolium</i>

NON FLOWERING PLANTS

Sphagnum moss Sphagnum sp

MAMMALS

Chipmunk	Tamias striatus
Cotton-tail Rabbit	Sylvilagus floridanus
Gray squirrel	Sciurus caroliniensis
Opossum	Didelphis marsupialis
Meadow vole	Microtus pennsylvanicus
Muskrat	Ondatra zibethicus
Raccoon	Procyon lotor
White-footed Mouse	Peromyscus leucopus
White-tailed deer	Odocoileus virginianus
Woodchuck	Marmota monax

BIRDS

Bluejay	Cyanocitta cristata
Carolina wren	Thryothorus ludovicianus
Catbird	Dumetella carolinensis
Cardinal	Richmondia cardinalis
Crow	Corvus brachyrhynchos
Downy woodpecker	Dendrocopus pubescens
Mockingbird	Mimus polyglotos
Ovenbird	Seiurus aurocapillus
Red bellied woodpecker	Melanerpes carolinus
Red-tailed hawk	Buteo jamaicensis
Robin	Turdus migratorius
Song sparrow	Melospiza melodia
Starling	Sturnus vulgaris
Turkey Vulture	Cathartes aura
Wild turkey	Meleagris gallopavo
White-breasted Nuthatch	Sitta carolinensis

BIRDS Not found but expected

Black-capped chickadee	<i>Parus atricapillus</i>
Broad winged hawk	<i>Buteo platyterus</i>
Chestnut-sided warbler	<i>Dendroica pensylvanica</i>
Common Grackle	<i>Quiscalus quisculoa</i>
Great Crested Flycatcher	<i>Myiarchus crinitus</i>
House wren	<i>Troglodytes aedon</i>
Mallard duck	<i>Anas platyrhynchos</i>
Mourning dove	<i>Zenaidura macroura</i>
Northern Flicker	<i>Colaptes auratus</i>
Northern Yellowthroat	<i>Geothlypis trichas</i>
Red-eyed vireo	<i>Vireo olivaceus</i>
Wood Duck	<i>Aix sponsa</i>
Wood thrush	<i>Hylocichla mustelina</i>
Veery	<i>Catharus fuscescens</i>
Yellow-shafted flicker	<i>Coaptus auratus</i>
Yellow Warbler	<i>Dendroica petechia</i>

AMPHIBIANS

Spring peeper	<i>Hyla crucifer</i>
Woodfrog	<i>Rana sylvatica</i>

AMPHIBIANS (Not found but expected)

Green frog	<i>Rana clamitans</i>
Jefferson salamander	<i>Ambystoma jeffersonianum</i>
Marbled salamander	<i>Ambystoma opacum</i>
Spotted salamander	<i>Ambystoma maculatum</i>

REPTILES

Eastern garter snake

Thamnophis sirtalis

REPTILES (Not found but expected)

Black rat snake

Elaphe obsoleta

Eastern milk snake

Lampropeltis triangulum

Northern water snake

Nerodia sipedon

Northern brown snake

Storeria dekayi

Wood turtle

Clemmys insculpta

ROBERT G. TORGERSEN, LA, CPESC
LANDSCAPE ARCHITECTURE AND ENVIRONMENTAL SCIENCES

THREE MAIN DRIVE, NANUET, NY 10954
Tel 845 623 4835 Fax 845 627 6622 E mail - rtorger@verizon.net

NYS LA LIC. # 451
NJS LA LIC. # 148
CPESC CERT # 899

November 9, 2009

Kirk Rother, PE
5 St. Stephen's Lane
Warwick, NY 10990

Re: Warwick Views dual jurisdiction wetland boundary.
Federal and State wetlands

Dear Mr. Rother:

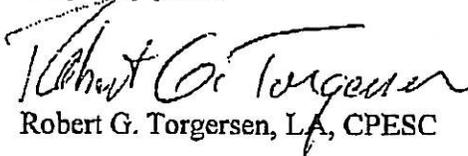
This office has been delineating freshwater wetlands for New York State DEC (NYSDEC) and Army Corps of Engineers (ACOE) Federal Wetlands since 1990. The criteria for the determination of the boundary of freshwater wetlands for each agency are the same. The boundary of each wetland is theoretically similar, being at some slight variance solely due to the interpretation of the specialist performing the determination.

The NYSDEC, in addition to the jurisdiction of the freshwater wetlands under their control, generally those over 12.4 acres in size, has jurisdictional control of the 100 foot adjacent area beyond the wetland boundary. In cases in which each agency has jurisdiction, the ACOE generally accedes to the NYSDEC to enforce their control of the jurisdictional wetlands, since their wetland protection effectively extends beyond the actual wetland boundary to include the 100 foot adjacent area.

The wetland boundaries on this project were defined by clearly visible breaks in topography, hydrophytic vegetation and hydric soils and did not leave any question regarding the wetland boundaries. As a result on these on site features, it would be impossible to come up with any result other than the wetland boundary as determined. Due to the site conditions, the boundaries were clearly defined with visible breaks in soils and vegetation.

In essence, the jurisdictional wetland boundary for each agency results in the same wetland boundary.

Very truly yours,


Robert G. Torgersen, LA, CPESC

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: WARWICK VIEWS Date: 5-31-07
Applicant/Owner: RICHARD STANFORD County: ORANGE
Investigator: ROBERT TORGERSEN State: NEW YORK

Do Normal Circumstances exist on the site? Yes No
Is the site significantly disturbed (Atypical Situation)? Yes No
Is the area a potential Problem Area? Yes No
(If needed, explain on reverse.)
Community ID: _____
Transect ID: _____
Plot ID: _____

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. PIN OAK	TREE	FACW
2. RED MAPLE	TREE	FAC
3. GREEN ASH	TREE	FACW
4. SILKY DOGWOOD	SHRUB	FACW
5. SPICE BUSH	SHRUB	FACW-
6. TUSSOCK SEDGE	GRASS	OBL
7. SOFT RUSH	GRASS	FACW+
8. REED CANARY	GRASS	FACW
9. SENSITIVE FERN	FERN	FACW

Large wetland area, mostly emergent marsh with some scrub/shrub or forest habitat along some edges.

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

HYDROLOGY

Recorded Data (Describe in Remarks): Wetland Hydrology Indicators: *mapped w/ 1/4 - N.W.I.*
 Stream, Lake, or Tide Gauge Primary Indicators: *numerous ditches within wetland.*
 Aerial Photographs Inundated
 Other Saturated in Upper 12 Inches
 No Recorded Data Available Water Marks

Field Observations:

Depth of Surface Water: — (in.)
Depth to Free Water in Pit: — (in.)
Depth to Saturated Soil: — (in.) *Bone dry on above date*

- Drift Lines
- Sediment Deposits
- Drainage Patterns in Wetlands
- Secondary Indicators (2 or more required):
- Oxidized Root Channels in Upper 12 Inches
- Water-Stained Leaves
- Local Soil Survey Data
- FAC-Neutral Test
- Other (Explain in Remarks)

Remarks:

SOIL SURVEY = DEC.

Project/Site: WARWICK VIEWS Date: 5-31-07

SOILS

Map Unit Name (Series and Phase): CARLISLE/ERIE Drainage Class: VPD/SPD

Field Observations Taxonomy (Subgroup): TYPIST MEDAPRIST/AERIC Confirm Mapped Type? Yes No

Profile Description:

Depth (inches) Matrix Color Mottle Colors Mottle Abundance/ Texture, Concretions, Size/Contrast Structure, etc.

Horizon	Depth (inches)	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Texture, Concretions, Size/Contrast Structure, etc.
CARLISLE	0-10"	7.5YR 4/1	7.5YR 4/4	mottled/clay/roots
	10-20"	7.5YR 5/1	7.5YR 4/4	mottled/clay
ERIE	0-6	10YR 3/2	-	topsoil/roots
	6-18	10YR 5/2	10YR 5/6	mottled/clay

Hydric Soil Indicators:

- Histosol Concretions
- Histic Epipedon High Organic Content in Surface Layer in Sandy Soils
- Sulfidic Odor Organic Streaking in Sandy Soils
- Aquic Moisture Regime K Listed on Local Hydric Soils List ERIE
- Reducing Conditions X Listed on National Hydric Soils List CARLISLE
- Gleyed or Low-Chroma Colors Other (Explain in Remarks)

Remarks:

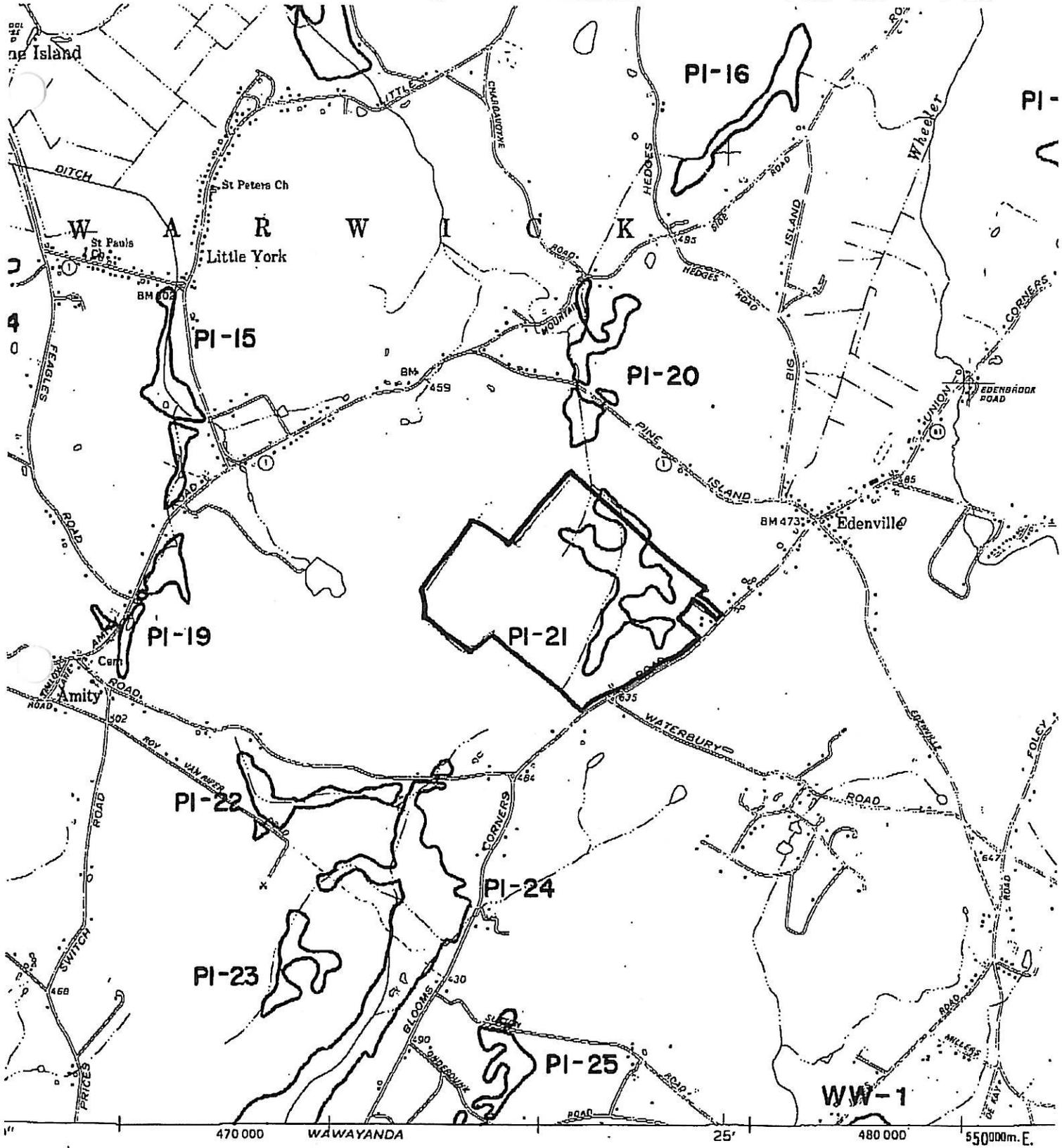
WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No (Circle) (Circle)

Wetland Hydrology Present? Yes No

Hydric Soils Present? Yes No Is this Sampling Point Within a Wetland? Yes No

Remarks:



SCALE 1:24 000

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 5 0 1 KILOMETER

Warwick Views
 Town of Warwick
 Orange County, New York
 New York State Freshwater Wetlands
 Pine Island Quad
 Scale 1" = 2000 Ft.

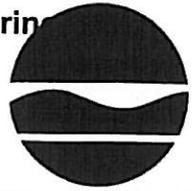
New York State Department of Environmental Conservation **Division of Fish, Wildlife & Marine Resources**

New York Natural Heritage Program

625 Broadway, Albany, New York 12233-4757

Phone: (518) 402-8935 • FAX: (518) 402-8925

www.dec.state.ny.us



Alexander B. Grannis
Commissioner

July 11, 2009

Kristen O'Donnell
Turner Miller Group
2 Executive Blvd, Suite 401
Suffern, NY 10901

Dear Ms. O'Donnell:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to an Environmental Assessment for the proposed 250-Acre Residential Subdivision, area as indicated on the map you provided, located at Blooms Corners Road, Town of Warwick, Orange County.

Enclosed is a report of rare or state-listed animals and plants, significant natural communities, and other significant habitats, which our databases indicate occur, or may occur, on your site or in the immediate vicinity of your site. The information contained in this report is considered sensitive and should not be released to the public without permission from the New York Natural Heritage Program.

The presence of the plants and animals identified in the enclosed report may result in this project requiring additional review or permit conditions. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, at the enclosed address.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our databases. We cannot provide a definitive statement on the presence or absence of all rare or state-listed species or significant natural communities. This information should not be substituted for on-site surveys that may be required for environment impact assessment.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

Sincerely,

Tara Salerno, Information Services
New York Natural Heritage Program

Enc.
cc:

Natural Heritage Report on Rare Species

NY Natural Heritage Program, NYS DEC, 625 Broadway, 5th Floor,
Albany, NY 12233-4757
(518) 402-8935



- ~This report contains **SENSITIVE** information that should not be released to the public without permission from the NY Natural Heritage Program.
- ~Refer to the User's Guide for explanations of codes, ranks and fields.
- ~We do not provide maps for species most vulnerable to disturbance.

Natural Heritage Report on Rare Species and Ecological Communities



MAMMALS

Myotis sodalis

Indiana Bat

NY Legal Status: Endangered

NYS Rank: S1 - Critically imperiled

Office Use

Federal Listing: Endangered

Global Rank: G2 - Imperiled

11288

County: Orange

ESU

Town: Crawford, Wawayanda, Minisink, Warwick, Montgomery, Blooming Grove, New Windsor, I

USFWS

Location: Documented within 2 miles of project site. Animals can move 2 miles or more from documented locations. For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager for the Region where the project is located.

1 Records Processed

More detailed information about many of the rare and listed animals in New York, including biology, identification, habitat, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.acris.nynhp.org, from NatureServe Explorer at <http://www.natureserve.org/explorer>, and from NYSDEC at <http://www.dec.ny.gov/animals/7494.html>.