

Chapter 6: Surface Water Resources and Wetlands

A. PROPOSED ZONING ACTION (GENERIC ANALYSIS)

EXISTING CONDITIONS

The proposed MOD Zoning Area contains several surface water resources and wetlands located in three distinct areas of the MOD (see **Figure 6-1**). The largest and most significant surface water resource and wetland complex is McGregor Brook which passes through the northern portion of the Proposed MOD on the NYPH property. This estuarine stream drains to the Hudson River and is surrounded by freshwater emergent wetlands. The McGregor Brook stream corridor has been classified by NYSDEC as a Hudson Valley Significant Biodiversity Area (SBA).

The second area containing surface water resources and wetlands is located in the eastern portion of the MOD Zoning Area on the Evergreen Manor site. This area contains three separate USACE jurisdictional wetlands including a pond and forested shrub wetland as well as two smaller wetlands.

The third wetland area is found in the southwestern portion of the MOD and includes Orchard Lake, an approximately 1.6 acre freshwater pond located on the Gyrodyne property and surrounded by forested shrub wetland.

FUTURE WITHOUT THE PROPOSED ACTION (NO-BUILD CONDITION)

In the Future without the Proposed Action, it is expected that the surface water resources and wetlands in the MOD Zoning Area would remain largely unchanged.

PROBABLE IMPACTS OF THE PROPOSED ZONING (BUILD CONDITION)

The Proposed MOD Zoning is not anticipated to adversely impact surface water resources and/or wetlands in the Town of Cortlandt as it does not directly authorize a specific development. However, the Proposed Zoning Action would result in the adoption of MOD Zoning which could potentially result in new development within the MOD Zoning Area at higher densities than allowed under existing zoning. Development actions could result in direct impacts to wetlands and buffers, add impermeable surfaces that will increase peak water flows into wetlands and waterbodies, and increase sedimentation into streams if shallow soils are eroded off steep slopes. There could also be increased contaminant concentrations in surface water by increasing peak flows from impermeable surfaces. Any project proposed under MOD Zoning would be required to conduct a site-specific SEQR analysis to determine if the project would result in any significant adverse impacts to surface water resources and wetlands. If any significant adverse impacts are identified, mitigation would be required to minimize or avoid impacts to surface water resources and wetlands.

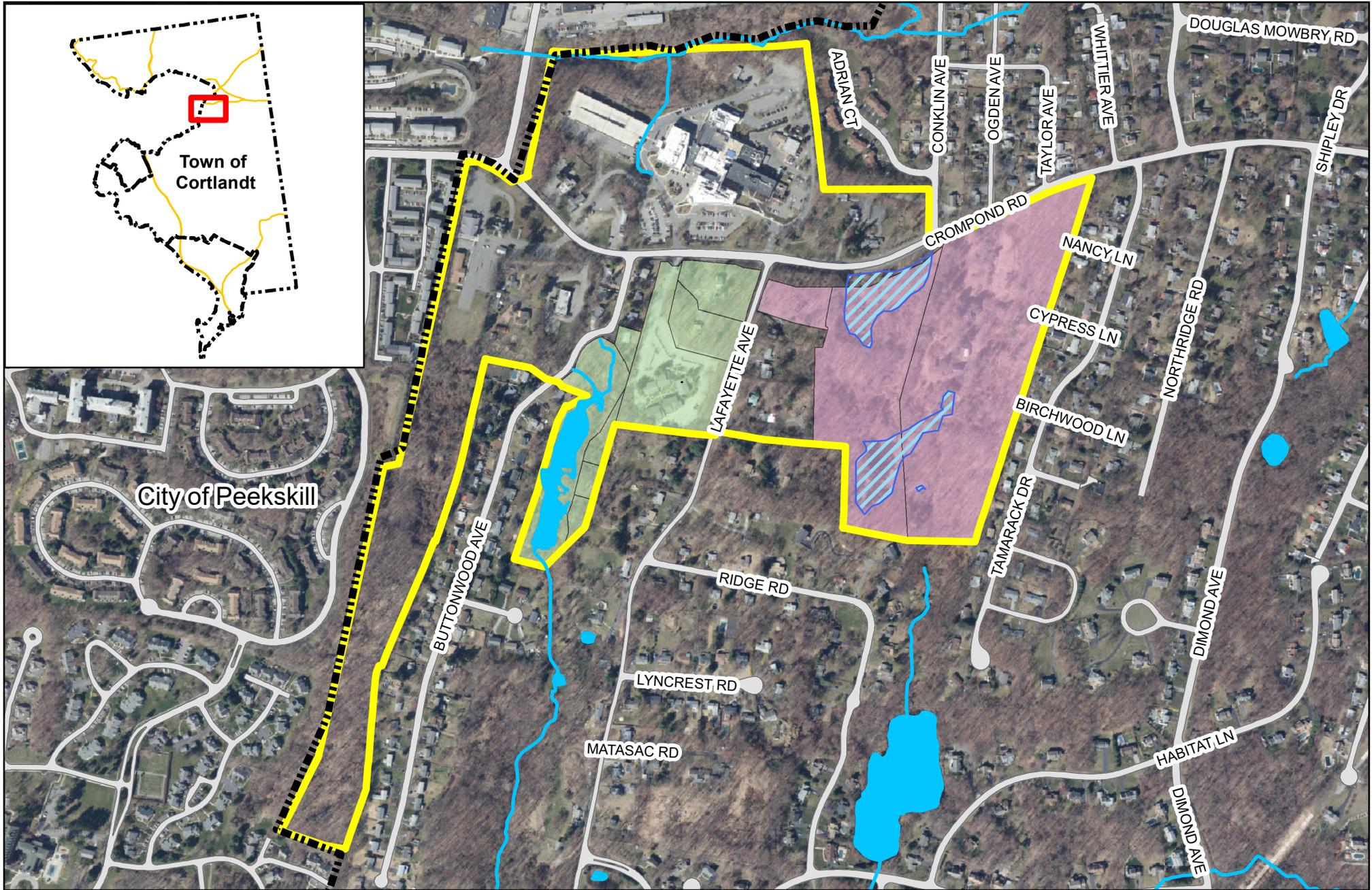


Figure 6-1
MOD
Wetlands, Waterbodies
& Watercourses
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Legend

- Municipal Boundary
- Watercourses
- Waterbodies
- Proposed MOD Boundary
- Approximate Wetland Extents (See DGEIS Chapter 6)

Sites Proposed for MOD Design

- Evergreen (VS Construction)
- Gyrodyne LLC

Scale: 0 0.0175 0.035 0.07 Miles

North Arrow: N

Project #: 1234567
 Map Created: January 2019

The town and its consultants do NOT provide any guarantee of accuracy or completeness and will NOT be held liable for any damages or losses due to its use. Data Sources: Westchester County GIS, Town of Cortlandt GIS, ESRI

MITIGATION

All projects proposed under MOD Zoning would be required to complete a site-specific SEQR analysis to identify the potential for specific impacts to surface water resources and/or wetlands. If any impacts are identified modifications to the project or mitigation would be required to avoid or lessen the potential for significant adverse impacts.

B. MOD DEVELOPMENT PLAN

EXISTING CONDITIONS

EVERGREEN

Existing Surface Water Resources and Wetlands

The approximately 28.6-acre Evergreen Manor Project Site has been mostly abandoned for a number of years, although a rental cottage on the property is still occasionally occupied. Portions of the site are wooded, with second growth trees and shrubs begin to dominate in formerly landscaped areas. There are no DEC mapped wetlands on the parcel; one National Wetlands Inventory (NWI) wetland (described as Wetland B, below) is shown on federal mapping. DEC and NWI mapping is attached (**See Figures 6-2 and 6-3**).

The wetlands located on the Evergreen Manor Project Site consist of three separate wetland areas, as shown on **Figure 6-4**.

Wetland B

The largest wetland (Wetland B) consists of a pond and forested wetland that also includes an intermittent stream as part of the wetland complex. This area was flagged from the rear (southern end) of the property and the boundary extends around the existing ponds and is located primarily inside existing stone walls that serve as the perimeter of this wetland complex. Vegetation within the forested section is typical of wetlands and includes tree dominants such as red maple and American elm and winterberry, silky dogwood, spicebush, and saplings of the dominant trees dominating the shrub layer. The herbaceous layer was sparse and consisted of skunk cabbage, sedges and fern varieties such as cinnamon, and sensitive fern. The soils present within the wetland consisted of organic soils with evidence of reduction and some mottles within the soil horizon. Several other hydric soil field indicators were readily apparent at the site. The site also exhibited hydrological indicators including soil saturation within the test hole or at the soil surface, inundation, and positive drainage patterns. Soils observed on site were consistent with NRCS soils mapping (**see Figure 4-4, Chapter 4, “Geology, Soils, and Topography”**). Overflow from Wetland B flows south, forming a tributary to Furnace Brook, eventually flowing to the Hudson River at Oscawana Island near Crugers.

Wetland C

The second wetland (Wetland C) receives drainage from Route 202 and overland runoff from higher elevations areas of the site. The wetland extends along the lower elevation portions of the property along the northern boundary, ultimately discharging to a culvert under Route 202 and flowing north. The watercourse exiting the site flows in a pipe under Conklin Avenue for approximately 260 feet. It then daylights for 30 feet before it goes back underground until it



Environmental Resource Mapper

Base Map: Topographical Using this map

Search

Tools

Layers and Legend

All Layers

★ Unique Geological Features

Waterbody Classifications for Rivers/Streams i

Waterbody Classifications for Lakes

State Regulated Freshwater Wetlands

State Regulated Wetland Checkzone i

Significant Natural Communities

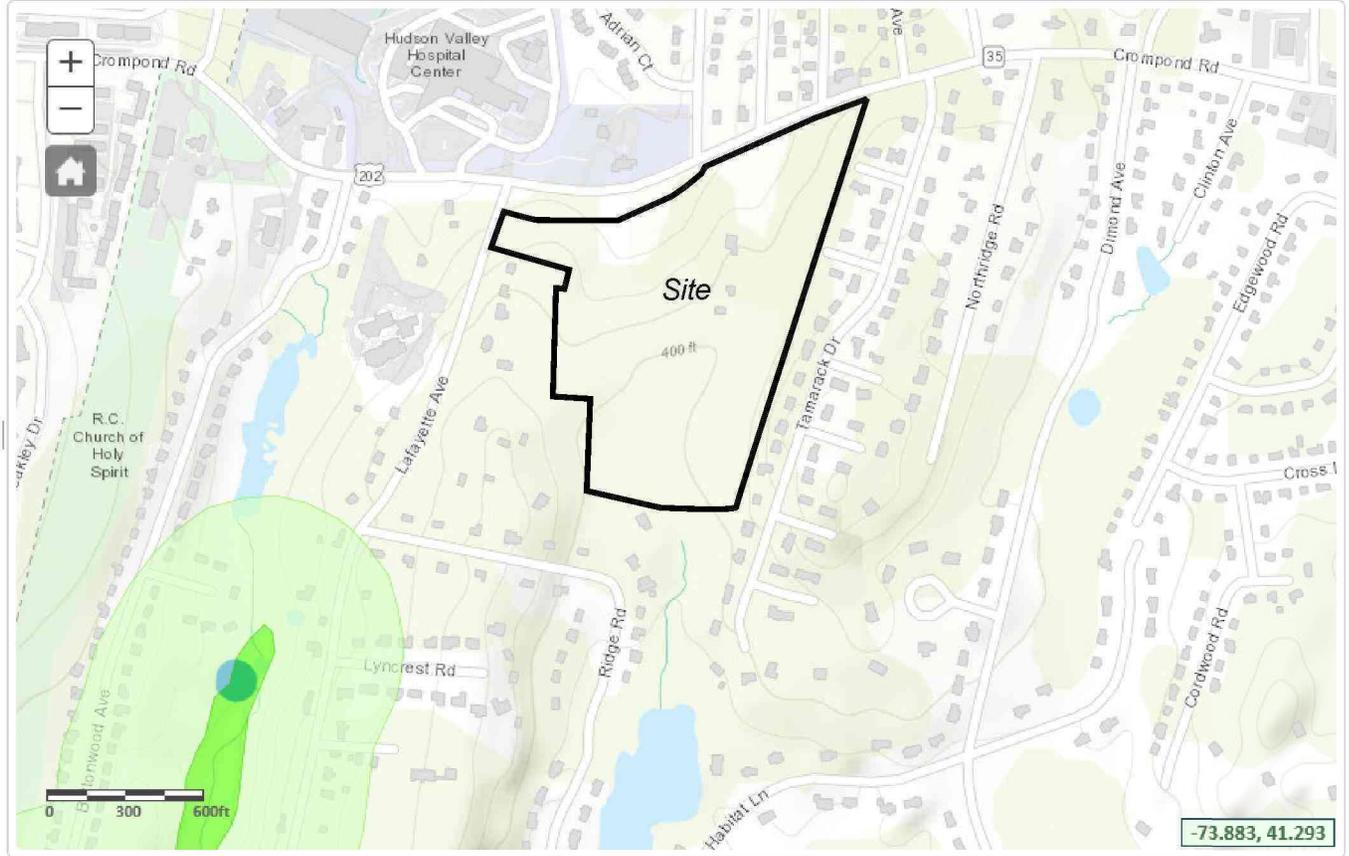
Other Wetland Layers

Reference Layers

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**Figure 6-2
DEC WETLAND
MAPPING**

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Environmental Resource Mapper

Base Map: Topographical Using this map

Search

Tools

Layers and Legend

Other Wetland Layers

National Wetlands Inventory

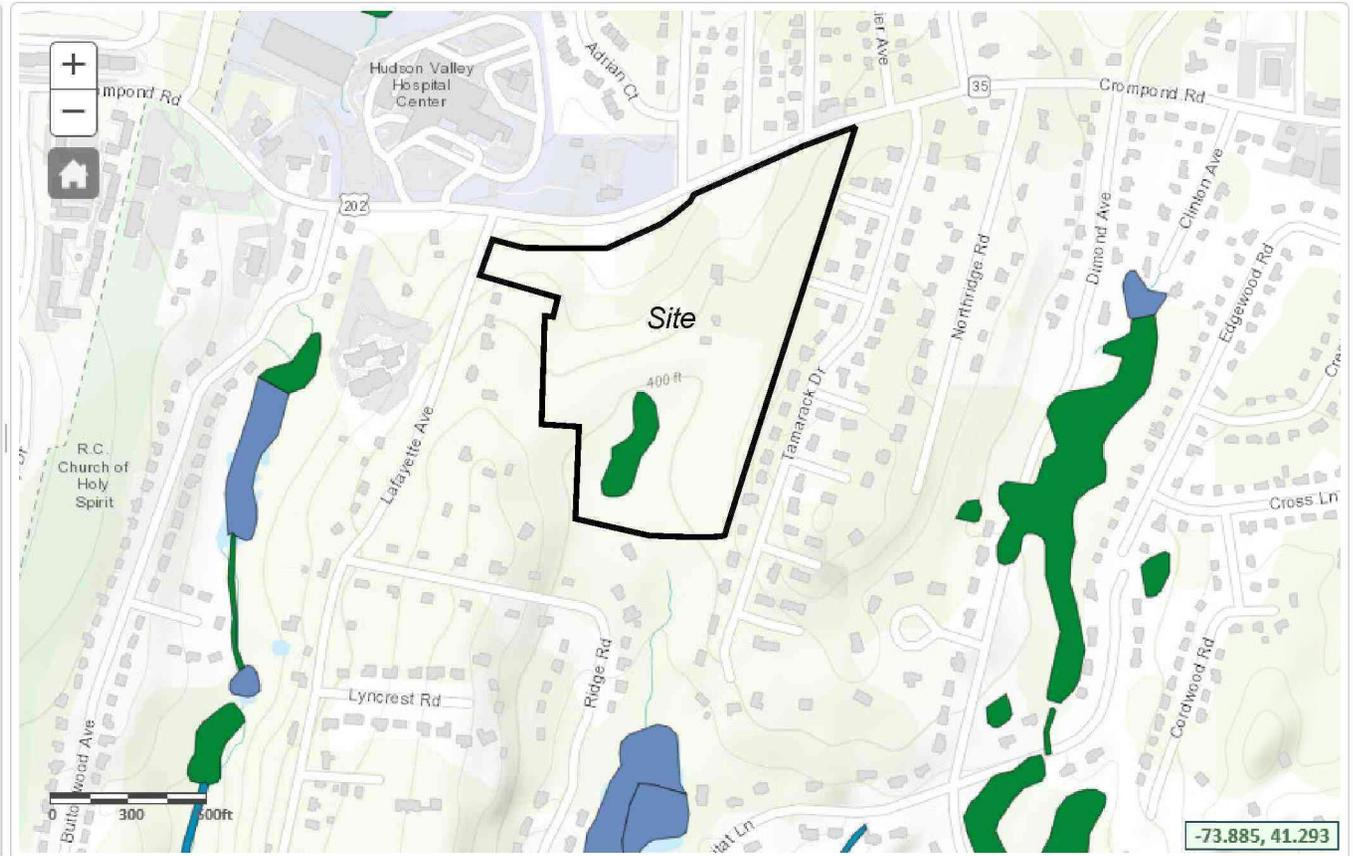
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

Reference Layers

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**Figure 6-3
NW1 WETLAND
MAPPING**

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**Figure 6-4
SITE WETLANDS**

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ultimately discharges to the wetland associated with McGregor Brook at an undetermined location approximately 600 feet from the inlet.

Wetland C shows signs of extensive site disturbance and the wetland has become dominated by invasive multiflora rose throughout the entire area. Interspersed throughout the hillside wetland are wetland shrubs and understory trees including silky dogwood, spicebush, winterberry, elderberry and arrowwood viburnum. Skunk cabbage, common rush and tussock sedge are prevalent within the ground vegetation. Several areas within the wetland edge exhibit evidence of significant saturation to the surface and low chroma soil colors.

Wetland A

The third wetland area is a small isolated wetland depression adjacent to the larger wetland in the southern portion of the property. It is located within the junction of two prominent stone walls and is separated from the main Wetland B complex. The soils were saturated to the surface and consist of low chroma colors indicative of hydric soils. Vegetation was dominated by red maple, American elm, spicebush, winterberry, and skunk cabbage and sensitive fern.

A prior wetland delineation was completed in 2005, and since that time the wetlands on the Evergreen Manor Project Site show significant signs of changes to hydrology and vegetative structure. Several invasive plant species have become dominant throughout the parcel. The property also appears to be much drier than when prior investigations were completed on the site. This was most notable within the larger rear forested wetland/pond complex. The depth of the pond appears to have decreased considerably since 2005.

Wetland Regulation Jurisdiction

New York State Department of Environmental Conservation (NYSDEC)

There are no NYSDEC mapped wetlands on the parcel.

Army Corps of Engineers

The subject wetlands located on the property would also meet the criteria to be regulated by the Army Corps of Engineers (USACE). If any direct wetland disturbance is proposed, a jurisdictional wetland permit would be required from the USACE. The USACE does not regulate any wetland buffer. If wetland disturbance is proposed, the USACE may require mitigation at a minimum of 2:1 replacement ratio. The USACE also would require that any mitigation be located within the same watershed that serves the wetlands resources on the property.

Wetland A does not overflow and is therefore hydrologically isolated from any tributaries to traditional navigable waters (TNWs).

Wetland B overflows to the south and is connected via surface connections to a larger pond south of the site, where it is then tributary to the large wetland complex associated with Furnace Brook Headwaters Reserve. From there, the waters form the Furnace Brook, a perennial relatively permanent water (RPW), flowing through a number of ponds and wetlands and ultimately to the Hudson River (the nearest TNW) at Oscawana Island. Wetland B is thus hydrologically connected to and adjacent to a TNW and associated wetlands along its route.

When water from Wetland C leaves the site flowing northward, it enters a pipe under Route 202 (See Figure 6-5, Photo 1). This pipe runs under the roadbed of Conklin Avenue, to the east of higher topography on the northwest corner of Route 202 and Conklin Avenue (See Figure 6-5, Photo 2). Approximately 260 feet to the north, the flow becomes part of the stormwater system for Conklin Avenue, and enters a catch basin which then diverts the flow to the west. This pipe daylight briefly on the north side of the adjacent property (See Figure 6-6, Photo 3), and flows through a small channel into another pipe inlet, where it is then conveyed approximately 600 feet further to the north in a pipe under the Adrian Court development (See Figure 6-6, Photo 4). It eventually reaches the wetland associated with the McGregor Brook (See Figure 6-7, Photo 5) at an undetermined location. This wetland is urban in nature and is dominated by *Phragmites australis*. Due to the density of the *Phragmites* and multiflora rose in this area, it was not possible to locate the pipe outlet. McGregor Brook eventually enters a pipe after Penelope Pond and is piped under the City of Peekskill (a minimum of 3,000 feet), discharging at an undetermined location into the Hudson River. Therefore, while it is hydrologically connected to the Hudson, intermediate topography, development and infrastructure effectively separate this wetland from other wetlands or streams.

Town of Cortlandt

Chapter 179 of the Town Code would also require mitigation of any wetland or regulated wetland buffer disturbance at a minimum of 1:1 replacement ratio for buffer disturbance, and that mitigation also be within the same watershed that serves the property. A 100-foot wetland buffer area is also required around the perimeter of a wetland or watercourse.

GYRODYNE

A small waterbody named Orchard Lake is located in the southwestern portion of the Gyrodyne Project Site. It consists of two small linear shaped ponds that run parallel to Buttonwood Avenue. The two ponds appear to be connected via culverts and a drainage channel. A dam and outlet structure is present along the south to southwestern edge of the smaller pond. Orchard Lake appears to be located within a ravine with relatively steep slopes on both sides, with a depth of approximately 6-10 feet. In August 2016, the freshwater wetland boundary was flagged and delineated by Stephen W. Coleman (see Appendix 6). It was determined that the waterbody met the criteria for being designated as a Town-regulated freshwater wetland because it possessed the three essential wetland characteristics: hydrophytic vegetation, hydric soils and wetland hydrology.

Surface water enters Orchard Lake from a culvert system underneath Crompond Road and travels in a north to south direction through freshwater wetlands located at the base of the lake on the northwesterly end, enters the Lake and discharges at the easterly end of the second pond area. Fringe freshwater wetlands are present along the entire length of Orchard Lake on the eastern side and extend to the property line of the existing homes located along Lafayette Avenue. At the northern end, freshwater wetlands are present that extend to the existing homes at the northern end of Buttonwood Avenue. Along the western border of Orchard Lake, the property drops off sharply along the rear property lines of the existing homes along Buttonwood Avenue. Beyond the dam at the southern end, freshwater wetlands are also present and extend towards the rear property lines of homes located along Birch Way. Drainage from the surrounding roads enters directly either via a stormwater drainage system or open drainage channels to the Lake.



Photo 1



Photo 2

**Figure 6-5
SITE PHOTOS**

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Photo 3



Photo 4

**Figure 6-6
SITE PHOTOS**

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Photo 5

**Figure 6-7
SITE PHOTOS**

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The freshwater wetlands consist of a remnant forested riparian wetland system with a perennial watercourse channel and open water ponds which form Orchard Lake. The associated wetland buffer areas appear to have been converted primarily to residential uses, consisting of lawn. The western side of the wetland buffer is more intact with the rear yards of existing homes more wooded and maintained in a natural state.

Orchard Lake and the property surrounding it provides important open space resources for the immediate area and provides other environmental benefits, such as attenuating stormwater and assisting with flood management and water quality maintenance. Accessibility to the Lake is limited and it does not appear to receive much use by local residents, other than via their rear yard areas. There is no visible trail system or other recreational areas to be utilized by the surrounding residents.

PROBABLE IMPACTS OF MOD DEVELOPMENT PLAN

EVERGREEN

Wetland Disturbance

In order to accomplish the proposed project on the Evergreen Manor site, some filling of regulated wetlands will be required.

Wetland C

Approximately 18,000 sf of Wetland C will be filled to provide access to Parcel 1 (proposed restaurant) and the creation of a building pad and parking area for Parcel 2 (two-story commercial building). Approximately 55,000 sf of this wetland (1.26 acres) will remain. The area to be filled will occur in the portion of the wetland identified as having the lowest function related to habitat, wetland vegetation, stormwater storage and aesthetic value. Historic aerial photos from 1926 clearly show this area as having been maintained as open field (see **Figure 6-8**). It is unclear when wetland characteristics developed in this portion of the site.

The proposed fill has the potential to alter site hydrology to the wetland, but this will be offset by runoff from the newly developed portions being routed through water quality basins before discharge back into the wetland.

As noted above, the functional connection between Wetland C and offsite/downstream wetlands is in question. The wetland does provide functions related to groundwater discharge and habitat, but these functions are compromised by the presence of invasive and non-native vegetation. In the Applicant's opinion, the filling of the southern part of this wetland is unavoidable in order to provide efficient internal access to Parcel 1. It is anticipated that the enhancement and restoration of the remainder of the wetland will provide mitigation for this impact, as further described below.

Wetland B

A road crossing at the northern edge of Wetland B is proposed in order to access proposed Parcel 4 (residential building). In this location the existing small pond overflows to the south, creating a narrow drainageway that ultimately conveys flows to the larger pond/wetland. A large culvert will be installed to minimize the disruption of this flow. A water quality basin will be constructed on the east side of the pond, and plantings will be added to make this a visual amenity.



Figure 6-8
1926 AERIAL
PHOTO

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GYRODYNE

The proposed Gyrodyne Project will disturb approximately 33,000 square feet (0.80 acres) of the delineated on-site wetland. The Proposed Action includes development within the wetland boundary and the wetland buffer area. This development includes the multi-family residential building, parking areas, the environmental education gateway, an amphitheater, a pedestrian bridge and gravel paths around Orchard Lake, as well as proposed landscaping. There will be no impacts related directly to Orchard Lake. The Gyrodyne Project proposes to keep the lake in its natural state without any disturbance.

A permit must be obtained from the Town in order to conduct any of the following activities: grading, cutting trees and development which disturbs any of the several functions served by the wetland. The Town may issue a permit to perform these regulated activities if it finds that the proposed regulated activities are consistent with the policies of Chapter 179 of the Town Code. According to Chapter 179 activities requiring a wetland permit must be consistent with the land use ordinances and regulations governing wetlands, compatible with the public health and welfare of the Town, and minimize the degradation to or loss of any part of the wetland.

The proposed Gyrodyne Project will not have any adverse impacts on any aquifer or on the local water table level. However, stormwater runoff will be contained on-site and discharged into Orchard Lake, providing for natural ground infiltration. This process will help ensure that a healthy water level is maintained in the lake that will support the surrounding natural environment.

The proposed Gyrodyne Project will not produce any impacts that will create areas of increased flooding risk on the Project Site.

MITIGATION

EVERGREEN

Wetland Mitigation Plan

In order to offset the functional impacts to the site wetlands that will be disturbed as part of the proposed construction, the Applicant is proposing a multi-phased mitigation plan that will result in expanded and enhanced existing wetlands. Stormwater management practices and buffer enhancement are also proposed to protect the wetlands in the long term.

The impacts to delineated wetland areas are necessary to provide efficient internal drives to access developable portions of the Evergreen Manor Project Site. It is the Applicant's opinion that this design represents the best layout for minimizing wetland, buffer and steep slope areas while allowing development of those portions of the site that will best support the proposed uses. The impacts to these areas result primarily in the loss of wetland vegetation and the disturbance of drainage and flow patterns. The proper design and implementation of the stormwater management plan will provide mitigation and allow the continuation of the stormwater conveyance and flood attenuation functions of the site wetlands. Because drainage patterns are not being significantly altered, the recharge/discharge capacity will not be altered. A detailed planting plan to offset the loss of wetlands vegetation is proposed (**see Appendix 6, SP-10.0, Wetland Mitigation Plan and Details for the Evergreen Manor Project**).

Two areas of potential wetland mitigation have been identified on site as shown on **Figure 6-9**, Wetland Mitigation Plan, and will result in the expansion of existing wetlands, and the sharing of wetland hydrology, rather than the creation of entirely new wetlands. These areas have been identified as having hydrology and topography that will allow expansion of existing wetlands and will offer additional water quality and habitat functions. The shared hydrology method can be a highly successful method of wetland mitigation when applied in small areas. The site topography precludes the creation of new, separate wetland areas without extensive regrading and diversion of hydrology sources.

The proposed wetland expansion could occur through the use of grading, soil amendment and planting of native wetland species suitable for the hydrologic regime prepared. The following species will be utilized as part of this wetland expansion/construction.

Table 6-1
Partial Plant List - Proposed Wetland Mitigation Areas

Plants	Wildlife Value ¹
Trees	
Red Maple (<i>Acer rubrum</i>)	very high
Black gum (<i>Nyssa sylvatica</i>)	Intermediate
Green Ash (<i>Fraxinus pennsylvanica</i>)	low
SMALL TREES:	
Shadblow Serviceberry (<i>Amelanchier canadensis</i>)	high
Shrubs	
Possumhaw viburnum (<i>Viburnum prunifolium</i>)	high
Arrowwood (<i>Viburnum dentatum</i>)	high
Highbush blueberry (<i>Vaccinium corymbosum</i>)	very high
Elderberry (<i>Sambucus canadensis</i>)	very high
Winterberry holly (<i>Ilex verticillata</i>)	high
Summersweet (<i>Clethra alnifolia</i>)	intermediate
¹ Source: G.L.Hightshoe, 1988: Native Trees, Shrubs, and Vines for Urban and Rural America. WILDLIFE VALUE KEY: Value as a food source: Very high: 50+ wildlife users, High: 25-49 wildlife users, Intermediate: 15-24 wildlife users, Low: 5-14 wildlife users, Very low: <5 wildlife users, NL: not listed.	



**Figure 6-9
WETLAND
MITIGATION PLAN**

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These species are native to the northeast, are well adapted to wetland hydrology and will provide food source, cover and nesting opportunities to local wildlife.

The construction of the stormwater management system, which includes water quality basins, bio-retention and subsurface infiltration, will mitigate the potential impact to the nutrient assimilation function of these onsite wetlands.

In summary, area is available for the creation/expansion of site wetlands as mitigation for unavoidable losses. A total of 35,944 square feet (0.83 acres) has been identified as potential mitigation areas, for a ratio of 2:1. Coupling this with an invasive species management program for Wetland C, which is the only significant wetland area of the site that is overgrown with non-native species, functional impacts to site wetlands can be more than offset by this development plan.

Invasive Species Monitoring and Control Program

By controlling exotic vegetation nearby native plants will have less competition and therefore have more resources available for their own growth. An invasive species monitoring and control program will be implemented at Wetland C as part of the overall development plan. Invasive species targeted for removal include the following:

- Tree-of-heaven (*Ailanthus altissima*)
- Multiflora rose (*Rosa multiflora*)
- Mugwort (*Artemisia vulgaris*)
- Autumn olive (*Eleagnus umbellata*)
- Garlic mustard (*Alliaria petiolata*)
- Purple loosestrife (*Lythrum salicaria*)
- Common reed (*Phragmites australis*)
- Oriental bittersweet (*Celastrus orbiculatus*)
- Porcelainberry (*Ampelopsis brevipedunculata*)
- Japanese Barberry (*Berberis thunbergii*)
- Japanese Stilt Grass (*Microstegium vimeneum*)
- Winged Euonymus (*Euonymus alatus*)
- Greenbriar (*Smilax rotundifolia*)

The above listed species and all other invasive non-native plants that are detrimental to the ecology of the project site will be removed during site development to the extent practicable. The goal of

this program is to reduce the presence of exotic/invasive species to a threshold of less than ten percent total cover. A qualified biologist/botanist will supervise the removal of invasive species.

The overall wetland mitigation plan also includes the enhancement of the buffer on the southern edge of Parcel 4. Due to parking requirements, the parking lot for the proposed residential development on this Parcel will be located within 100 feet of Wetland B. However, buffer enhancement is proposed to clear out brush and non-native vines, remove the rubbish from the site, and replant based on the submitted plan sheet. Vegetation on this part of the site is wooded immediately along the wetland edge but thins out to old field and a former dump site. At a minimum the following trees and shrubs will be used in this area.

**Table 6-2
 Partial Plant List – Proposed Buffer Enhancement Area**

Plants	Wildlife Value ¹
Trees	
Red Maple (<i>Acer rubrum</i>)	very high
Sweetgum (<i>Liquidambar styraciflua</i>)	low
Pin Oak (<i>Quercus palustris</i>)	very high
Shrubs	
Nannyberry (<i>Viburnum lentago</i>)	high
Arrowwood (<i>Viburnum dentatum</i>)	high
Witchhazel (<i>Hamamelis virginiana</i>)	low
Gray dogwood (<i>Cornus racemosa</i>)	very high
Inkberry Holly (<i>Ilex glabra</i>)	high
¹ Source: G.L.Hightshoe, 1988: Native Trees, Shrubs, and Vines for Urban and Rural America. WILDLIFE VALUE KEY: Value as a food source: Very high: 50+ wildlife users, High: 25-49 wildlife users, Intermediate: 15-24 wildlife users, Low: 5-14 wildlife users, Very low: <5 wildlife users, NL: not listed.	

GYRODYNE

The Gyrodyne Project includes development within the delineated boundary of the on-site freshwater wetland. While this development is an integral part of the overall campus plan, much consideration has gone into the mitigation proposed to off-set this impact (see **Appendix 6**, Gyrodyne Site Plan sheets C5.1 and C5.2). The area around Orchard Lake is proposed to become a recreational resource and will be enhanced with passive walking trails and landscaping. Great effort has been taken to revegetate the area with native wetland plants and ground cover, while also using natural materials and mulch to demarcate the path around the

lake. Orchard Lake itself will remain undisturbed and in its natural state. These improvements will help to improve the lake and wetland area in order to make it available and easily accessible for public use. Areas within the wetland boundary and wetland buffer will have permeable pavers and porous asphalt.

The stormwater improvements include an integrated approach that combines numerous green infrastructure components with traditional mechanisms to prevent flooding and reduce impacts downstream. As per the Town stormwater regulations which utilize the standards set forth in the New York State Stormwater Design Manual, the project results in a net reduction of stormwater runoff from the project site as compared with existing conditions (pre-development). Fundamental green infrastructure components to this approach include the use of pervious pavement throughout the site providing pre-treatment and surface infiltration, concrete structures below grade providing stormwater detainment and opportunity for sub-surface infiltration, bio-swales providing pre-treatment, surface detainment, and opportunity for surface infiltration. Also included are jellyfish chambers, providing high flow pre-treatment and membrane filtration which removes floatables, trash, oil, debris, TSS, fine silt-sized particles, and a high percentage of particle-bound pollutants; including phosphorous, nitrogen, metals and hydrocarbons.