

3.2 Wetlands

3.2.1 Existing Conditions

The majority of this site is upland woods, but there are some wetlands on the property. Most prominent is a New York State wetland on The Fairways parcel.

State Regulated Wetlands

A portion of New York State DEC Wetland LC-27 (approximately 30 acres) is located on The Fairways parcel (Figure 3.2-1). This wetland is a drowned marsh area which is now permanently inundated as the result of a beaver dam (see photo 5 in Appendix M). There continues to be recent evidence of beaver activity.

In the 1954 aerial photo, this area is shown as a well developed wooded swamp. The lack of trees remaining (or even dead tree trunks) leads to the conclusion that this area has been flooded for some time, unless it was logged prior to the beaver activity. Large trees do remain along the submerged fringes (photo 6). The ponded area of this wetland drains over the existing beaver dam at the south end of the wetland and into a stream corridor, described below.

This wetland has one to three feet of water, receiving surface runoff and shallow lateral flow from the hillsides on either side. Additional water drains by overflow from DEC Wetland LC-26, which is connected to LC-27 via a narrow stream channel. In the deeper, open parts of the marsh, vegetation is dominated by pickerelweed (*Pontederia cordata*), duckweed (*Lemna* sp.), woolgrass (*Scirpus cyperinus*), tussock sedge (*Carex stricta*) and occasional stands of cattail (*Typha latifolia*). Along the submerged fringes, tree and shrubs species dominate, including red maple (*Acer rubrum*), slippery elm (*Ulmus rubra*), American elm (*Ulmus americana*) and green ash (*Fraxinus pennsylvanica*). In higher and drier portions of the delineated wetland, shrub species including winterberry holly, witch hazel (*Hamamelis virginiana*), spicebush (*Lindera benzoin*) and northern arrow-wood (*Viburnum dentatum*). Soils within the main part of the wetland are described by the Putnam County soil survey as "Palms and Carlisle soils, ponded," which are very deep, very poorly drained organic soils that are inundated for most of the year. The adjacent wetland areas are Ridgebury loams (RdB), a common soil in transitional wetland areas on slopes of 3 to 8 percent.

Wetland LC-26 is situated south of Fair Street. It is mostly located on the Centennial Golf Club property, with a small section (approximately 0.16 acres) on the The Fairways site. This wetland is primarily a wooded swamp, dominated by red maples with spicebush and redosier dogwood in the understory. Groundcover within the central portion of this wetland is characterized by dense growth of tussock sedge and skunk cabbage. Hydrology to LC-26 is provided by shallow lateral flow and stormwater runoff from the adjacent slopes to the east, north and west, and runoff from Fair Street. Approximately 0.88 square feet of the 100-foot buffer from Wetland LC-26 is located on The Fairways site.

Federal and Locally Regulated Wetlands

An area of groundwater seepage, made up of the surface discharge of shallow lateral flows, exists in the east-central portion of the Gateway parcel, as shown on Figure 3.2-2, and is

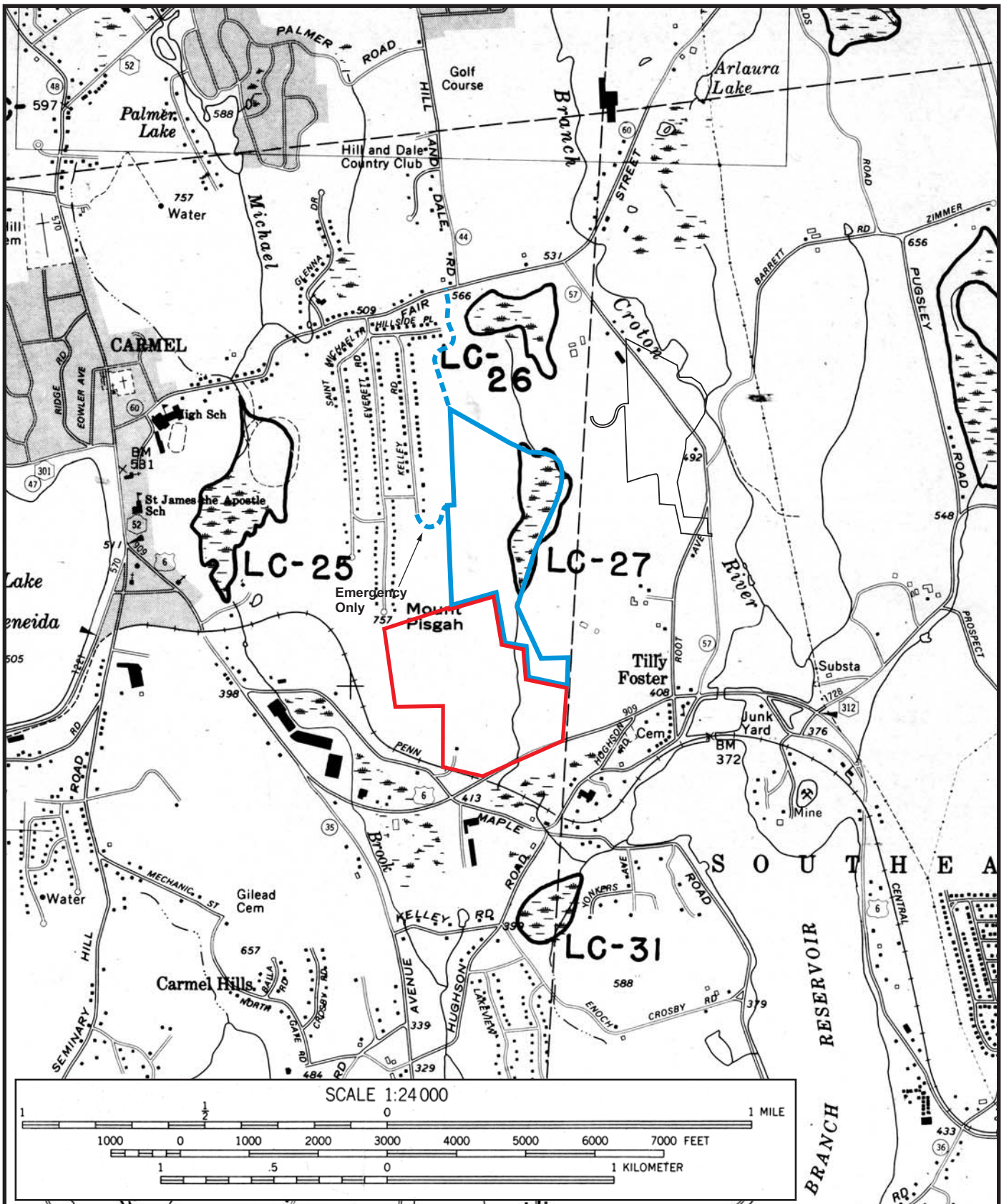


Figure 3.2-1: NYS Freshwater Wetlands
 Gateway Summit / The Fairways

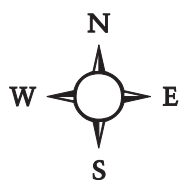
Town of Carmel, Putnam County, New York

Source: NYSDEC Freshwater Wetlands Map (Lake Carmel Quad)

Scale: 1" = 2000'

KEY

- = Gateway Summit
- = The Fairways
- - - = Fairways Access



File 02136 08/05/04

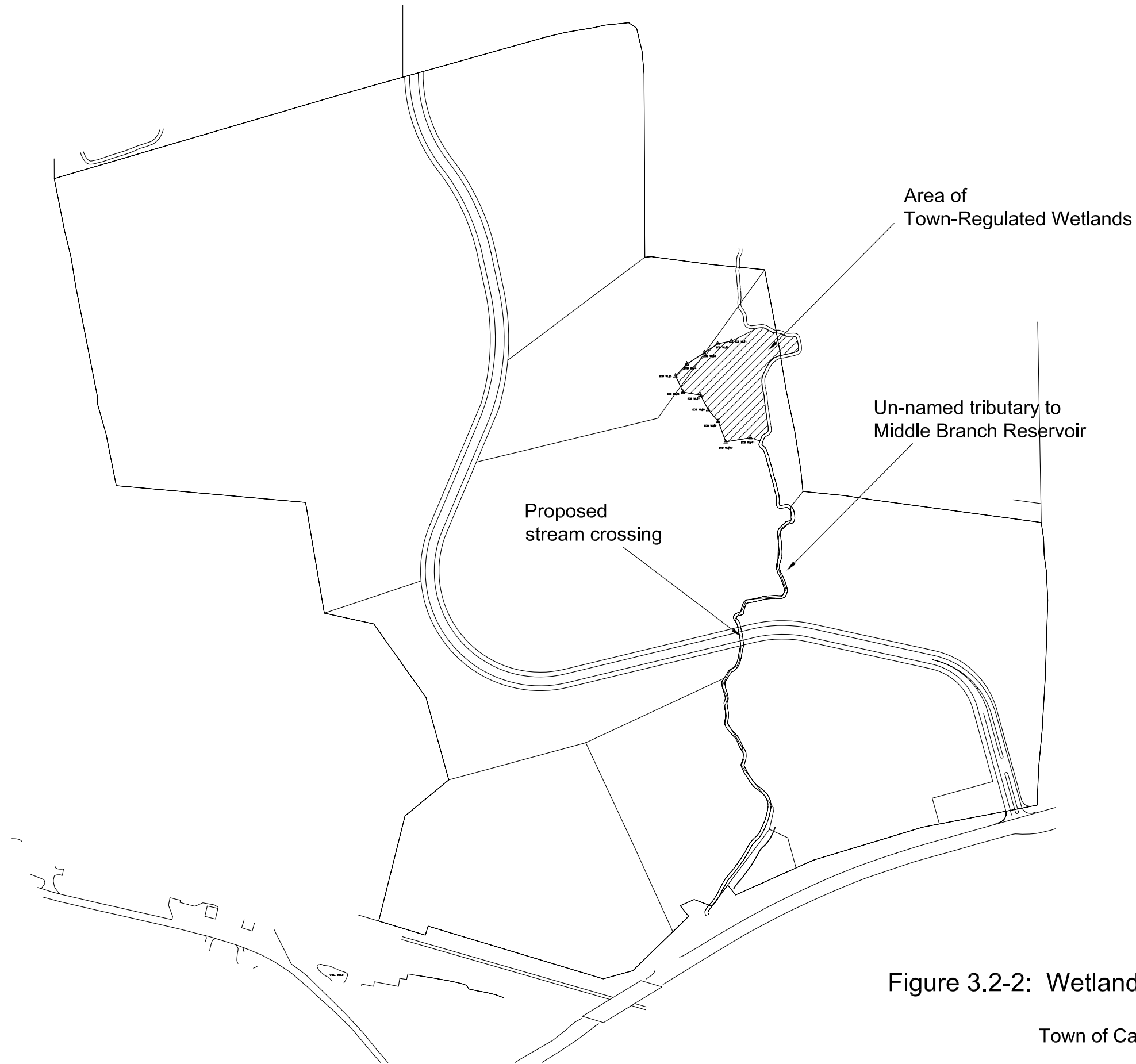
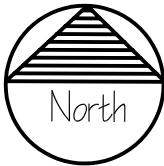


Figure 3.2-2: Wetlands on the Gateway Parcel

Gateway Summit/The Fairways
 Town of Carmel, Putnam County, New York

Source: Putnam Engineering, PLLC

Scale: 1 inch = 300 feet



located almost entirely on proposed Lot 8 (photo 7). Approximately 1.5 acres in area, this wetland is regulated by the Town of Carmel and the Army Corps of Engineers.

This wetland is not shown on the National Wetlands Inventory maps (Figure 3.2-3), and was flagged by Steve Marino, PWS, of Tim Miller Associates, Paul Jaehnig, CPG, of Paul J. Jaehnig Wetlands and Soils Consulting and Dave Klotzle, wetland inspector for the Town of Carmel. A copy of Mr. Jaehnig's report is included in Appendix N.

The boundaries of the wetland were determined by a dominance of hydrophytic vegetation, presence of hydric soils, and hydrological indicators. It exists primarily as a wooded wetland, dominated by red maple, spicebush, barberry, tussock sedge and various fern species. Soils in the wetland are identified by the Putnam County soil survey as being Ridgebury loams on 0 to 3 percent slopes, which is identified as a hydric soil. This identification was confirmed by field sampling of soils in the wetland. A stream, identified by the New York State DEC as a tributary to the Middle Branch Reservoir, flows along the eastern fringe of this wetland.

This wetland drains overland and through shallow braided channels to a riparian corridor that flows from north to south, as described below.

Stream Corridor

A stream corridor drains the site from the north to the south, and is identified by the New York State DEC as an un-named tributary to the Middle Branch reservoir. The DEC has classified the stream as a Class C waterbody. This watercourse begins in Wetland LC-26 at the north end of The Fairways site, then drains through Wetland LC-27 along the eastern side of the property. This perennial stream has a stony substrate, and in several places passes through stone walls that provide some additional habitat. Except for a small band on the west side of the stream channel, as described above under "Federal and Locally Regulated Wetlands", the stream does not have wetland vegetation along the majority of the channel. Photos 8, 9, 13 and 14 in Appendix M show various sections of the stream.

The damming of the stream by beaver activity (photo 5) has resulted in the submersion of what was once a wooded wetland in LC-27. The 1954 aerial photograph presented in Section 3.3 shows the wooded cover type that formerly existed and the general flow path the stream once followed prior to the damming.

Small reptiles, crustaceans and amphibians living within the stream corridor offer additional food sources to some of the larger omnivorous mammals that may be present (i.e., raccoons, fox), and the relatively undeveloped nature of the watershed draining to the watercourse system ensures good water quality both for the aquatic and semi-aquatic species and the larger mammals that feed on them. The watercourse leaves the site through two culverts under Route 6 (photo 9).

3.2.2 Wetland Function

Table 3.2-1 lists the regulated site features, including a description of the size and wetland type.

Table 3.2-1 - On Site Wetlands Gateway Summit - The Fairways Town of Carmel			
Wetland ID	Wetland Area (ac.)	Wetland Type	Wetland Description
DEC LC-27	30.03	Depressional	Marsh w/ wooded fringe
DEC LC-26	0.16	Depressional	Swamp
Town/Fed. Wetland	1.50	Slope	Swamp
Total	31.53		

Included with the description of each wetland area is an evaluation of wetland functions. This evaluation is based on a modified version of the Magee Hollands "Rapid Procedure for Assessing Wetland Functional Capacity". The analysis is set up to allow evaluation of several parameters related to wetland value and function. These parameters are:

1. Position in the landscape
2. Hydrology
3. Soils
4. Vegetation

When considering the functions of the wetlands, parameters are evaluated based on a number of specific variables, including:

1. Modification of groundwater discharge
2. Modification of groundwater recharge
3. Storm and Flood-water storage
4. Modification of Stream Flow
5. Modification of Water Quality
6. Export of Detritus
7. Contribution to Abundance and Diversity of Wetland Vegetation
8. Contribution to Abundance and Diversity of Wetland Fauna

By evaluating aspects of each of these variables based on existing site conditions, it is possible to evaluate the level at which the existing wetland is providing these functions.

Wetland LC-27

Wetland LC-27 on The Fairways site provides a number of environmental and public benefits and values, including wildlife habitat, stormwater quality and quantity management (including flood control) and providing a diversity in the vegetative community.

The flooding of this wetland resulted in a standing pool of water, which slows the movement of stormwater runoff through the property, resulting in the settling of particulates and additional residence time for biological activity to treat dissolved nutrients. This has a positive influence on water quality, which is important considering the presence of the golf course to the north, east and west.

The shallow depth of water within the marsh (typically from one to three feet) allows for the growth of emergent and submergent vegetation over much of the surface area, increasing the physical filtering of water moving through the system.

The availability of year round water also provides habitat for fish, salamanders and some reptiles. It is likely that a number of amphibian and reptile species utilize this wetland, including snapping turtles, painted turtles, northern water snakes, green frogs, pickerel frogs, bull frogs and spring peepers.

The stems and roots of the submerged vegetation provide cover for juvenile fish, tadpoles and other amphibian larvae and macroinvertebrates. The availability of these in the food chain provides food for predatory species, including the fish and turtles. Waterfowl are also utilizing this wetland, which offers a mix of food sources including seeds and invertebrates.

The size of the wetland in the landscape adds to its value. The watershed draining through the wetland has the benefit of the water quality treatment provided, and the tributary to the Middle Branch Reservoir that leaves the site is ensured a regular presence of baseflow, contributing to the moderation of stream flow and groundwater discharge functions.

The buffer to Wetland LC-27 is varied. On the east, the buffer includes a strip of woodlands between the open water and the play areas of the Centennial Golf Club. To the south and west, the buffer is a wooded slope. Occasional drainageways drain the upland areas through the buffer following storm events, with the majority of the wetland hydrology getting to the wetland via infiltration through the buffer area.

Wetland LC-26

A small portion of LC-26 (0.16 acres) is located on The Fairways site, as well as a 0.88-acre portion of the 100-foot buffer for this wetland. Similar to Wetland LC-27, LC-26 provides a number of functions that are valuable to water quality and the local ecosystem. Stormwater runoff from portions of the golf course property and Fair Street drain through the wetland, which absorbs and attenuates suspended and dissolved nutrients. The dense biomass, particularly in the groundcovers, provides physical filtering of flows through the wetland before they become concentrated within the stream channel that drains LC-26. The dense wooded areas within the center of the wetland provide valuable habitat for woodland bird and animal species, and edge habitat is provided adjacent to the open areas of the golf course.

Town/Federal Wetland

The small wetland area in the area of proposed Lot 8 of the Gateway parcel provides a different condition than the remainder of the property. With a moist substrate and occasional standing water, this area provides habitat for reptiles and amphibians that does not exist in dryer areas of the site. Because of drainage patterns in the area, this wetland becomes saturated within narrow drainage channels, which may become seasonally flooded in the spring, potentially providing breeding habitat for amphibians. The wetland also provide sheet flow as well as some shallow braided channels that convey water to the stream channel that borders the wetland on the east. Evapotranspiration then allows for drying out of the substrate and the growth of vegetation that acts as cover for small species. At 1.5 acres, however, this wetland is too small to provide diverse habitat for large numbers of wetland dependent species that are less common to the property.

Hydrology is provided by the discharge of shallow lateral flows from over compacted subsoils, which contributed to the discharge of groundwater and the provision of baseflow to the stream system. Good tree coverage within the wetland provides shade for the watercourse and moderates temperature fluctuations. Although no fish species have been observed on site, moderation and maintenance of stream temperatures is important to fish survival in downstream areas.

The buffer to this wetland is mostly wooded, but there are areas of open meadow and developed areas at the south end of the property. The buffer serves to filter overland runoff and provide a transitional zone for those species that utilize both the riparian corridor and the adjacent wooded uplands.

3.2.3 Potential Impacts

Gateway Summit

Construction of the subdivision road for the Gateway Summit project will require a crossing of the riparian corridor. This activity will require a permit from the Town of Carmel and possibly the Army Corps of Engineers. Permission for the impervious surfaces associated with this proposal will be required from the New York City DEP as part of a stormwater pollution prevention plan for activities within 100 feet of a perennial stream. An Article 15 permit from the New York State DEC is not required for the proposed road crossing.

A large box culvert or oval pipe is proposed for the stream crossing, and will allow the continued unimpeded flow of water from north to south and movement of wildlife. Final design of the crossing has not been completed, but could include an oval pipe or three-sided box culvert to allow for a naturalized stream bottom. Under the current plan, the stream will be conveyed through this pipe for a total of 190 feet. Final plans will be prepared to ensure that stream quality is not impacted by upstream activities, and diversion of the main flow will occur around the area of the culvert while under construction. A proposed pedestrian bridge will span the watercourse between Lots 1 and 2, and will require minor temporary disturbance of the stream buffer for the installation of pilings to support the bridge.

The proposed location of the stormwater quality basins for the subdivision road will require some encroachment into the 100 foot buffer of the Town-regulated wetland on Lot 8. This will consist of clearing trees in the area, regrading for the basins, then re-planting to stabilize the site. A similar approach will be taken to mitigate buffer impacts associated with water quality basins for the development on Lots 1, 2 and 7.

Impacts from these activities may include the short-term disruption of biological and physical activities within the existing stream bed, and the alteration of the flow through the stream channel, and the filtering of overland runoff and shallow subsurface flows that currently drain to the wetland and watercourse areas.

The Fairways

The construction of a stormwater quality basin and the access road from Fair Street will require activities within the 100 foot buffer to Wetland LC-26, which will require approvals from the NYSDEC and the Town of Carmel. These activities are unavoidable due to access

restrictions and the requirement to treat runoff from this section of the road. Some grading for the road access and stormwater management basin may encroach within 50 feet of the wetland. A retaining wall is proposed to minimize the grading and prevent any further encroachment. With the exception of this wall, no impervious surfaces are proposed within 100 feet of the wetland. Total buffer impacts are approximately 0.63 acres. These impacts are temporary in nature, due to grading, basin and wall construction activities. If the site is stabilized and re-vegetated following grading, no long term impacts to the wetland are expected.

No activities associated with The Fairways project will disturb the wetland or the wetland buffer to LC-27.

3.2.4 Mitigation Measures

Gateway Summit

With the exception of the proposed stream crossing, no direct impacts to regulated wetlands or watercourses are proposed. A detailed construction plan for the crossing will be provided to the NYCDEP, and will consider the type of crossing to be implemented (arch culvert, box culvert, etc.) and the sequencing of this construction to ensure that impacts to downstream receiving waters are avoided, in compliance with DEP and DEC regulations. This must be properly planned considering the relatively short distance to the Middle Branch Reservoir. This sequencing plan will consider the order of installation of stream diversion, footings and/or bridge abutments, side slope stabilization and other factors. The applicant will work closely with the DEP to finalize the crossing plans as he progresses the stormwater pollution prevention plan application.

The use of a box culvert and restoration of a naturalized stream bed under the culvert will allow for continued conveyance of flows from north to south and continued aeration of water as it moves through the site. The naturalized stream bottom will also provide for some biological activity under the culvert, although the absence of light will limit this function.

The proposed water quality basins, once stabilized and replanted will replicate the stormwater filtering and bioattenuation function that the existing buffers currently provide. Although this activity will alter the vegetative make up of the buffer, the absence of hard structures and the provision of vegetation that will not be maintained on a regular basis will result in the continuation of the buffer's ability to protect the adjacent wetlands.

The Fairways

Following construction of the access road from Fair Street, the side slopes and water quality basin will be seeded and re-planted. This will restore the buffer function, and protect LC-26 in the long term.