C. SURFACE WATER RESOURCES

C.1 Existing Surface Water Resources

The Fishkill Creek is approximately 200 feet west of the property boundary and is oriented in a north – south direction west of Creek Bend Road. The Fishkill Creek has a New York State Department of Environmental Conservation water identification number of H-95-10[16] and is classified[17] as having a "B (t)" standard.[18] Ultimately this creek receives most of the surface (and subsurface) runoff from the Hilltop Manor property where after the Fishkill Creek discharges into the Hudson River southeast of the project site. There are no Federal, State, or Town regulated wetlands or adjacent area on the property as per field investigations and NYSDEC published wetland maps.

As a part of the National Flood Insurance Program, the Federal Emergency Management Agency (FEMA) produces maps of the 100-year flood boundary. No 100- year flood boundary exists on the property as shown in the full sized plans (*Figure IIIC.1-1 Subdivision Layout Plan With Floodplain*). The Zone B floodplain for Fishkill Creek is immediately west of the southwest property boundary, bordering Creek Bend Road.

Currently, stormwater runoff follows the topographical contours of the property. The property occupies a broad ridge that generally runs in a north – south direction. The central portions of the site contain more level topography with steeper hillsides on the eastern and western edges of the site. Stormwater drainage currently drains towards the east and the west in two primary drainage areas. Existing stormwater run-off conditions are fully analyzed in the Stormwater Pollution Prevention Plan (SWPPP) prepared for the Hilltop Manor Subdivision (revised February 16, 2010). The SWPPP is provided in Appendix 4. Current stormwater drainage conditions are shown in the full sized drawing C.1-1 Pre-Development Analysis for Hilltop Manor (see attached). Stormwater from the non-point sources generally percolates through the soil.

The stormwater design points or watershed design points are the areas that the surface runoff leaves the property and proceeds onto abutting lands. These plans show the two primary drainage areas mapped on the property, as well as nine (9) subdrainage areas. As shown in the Pre-Development Analysis (Drawing C.1-1), drainage Area 1, including four subareas, flows towards the west eventually flowing to Fishkill Creek. Drainage Area 2, including five subareas, flows towards the east, also into the Fishkill Creek drainage area.

Pre-development stormwater run-off peak flow values were determined for the 1, 2, 10, 25 and 100 year design storm events. This analysis is further described in the SWPPP provided in Appendix 4. Times of Concentration (Tc) and Peak Flow values (Q) were calculated using mapped soil types and the site's topography.

[16] New York State Department of Environmental Conservation Stream Maps, Hopewell Junction Quadrangle.
[17] According to 6 NYCRR Article 2, Classifications and Standards of Quality and Purity. The classification of a stream defines the level of purity or quality for any waters in relation to their reasonable and necessary use with a Class A being the highest quality water with the most restricted uses and a Class D stream being the lowest quality water with the least restrictions on use. No portion of Fishkill Creek is on the site.
[18] 6NYCRR 862.6
[19] Drainage Design points depicted on Stormwater plans in Appendix 4.

Table C.1-1 Pre-Development Stormwater Runoff					
Drainage Design Point	**1Yr.**	**2 Yr.**	**10 Yr.**	**25 Yr.**	**100 Yr.**
	2.5 in.	**3.5 in.**	**5.0 in.**	**6.0 in**	**8.0 in.**
#1	10.55	23.66	46.76	63.36	97.90
#2	4.17	9.88	20.11	27.53	43.07
Source: Stormwater Pollution Prevention Plan (SWPPP) Hilltop Manor Subdivision (revised February 2010)					

C.2 Potential Surface Water Resource Impacts

Development of the project site will result in the modifications to the on-site stormwater flow, primarily as changes to the drainage subbasins. Overall, stormwater will continue to flow to the existing design points at the edges of the project site. Post-development drainage areas and stormwater management features are shown in drawing C.2-1 Post-Development Analysis for Hilltop Manor.

Stormwater management will include the construction of a system of catch basins and piping to redirect run-off from roadways and paved surfaces and direct it to stormwater management practices. Three management facilites practices are proposed to control stormwater flow rates and to provide water quality treatment. These faciliteis are further described in C.3 Surface Water Mitigation Measures., below.

Construction activities including construction of three stormwater management ponds will result in the removal of vegetative cover and topsoil from approximately 28.75 acres. Vegetative cover binds the soil and prevents erosion. Erosion of the soil surface can lead to siltation build-up with offsite impacts to resources including: increased turbidity, reduced dissolved oxygen levels, increased stream temperatures, , and decreased light penetration to submerged aquatic flora in offsite watercourses and wetland areas.

The proposed action will increase impervious surfaces on the site, including roads, driveways and residential structures. Based on the revised Site Plans, the project will result in approximately 4.44 acres of impervious surface. This impervious surface could result in increased pollutant loading into the local stormwater systems (see Drawing *C.2-1 Post Development Analysis for Hilltop Manor*). Those potential pollutants include oil and grease, heavy metals, and chloride from salts used to control icing of pavements. This pollution is typical of all pavement areas designed for use by automobiles and trucks. Additional impacts from stormwater runoff can result in erosion of soils and sedimentation into drainage design points. These potential impacts will be mitigated through the proposed stormwater management practices described in the SWPPP (Appendix 4) and in Mitigation Measures, below.

A wetland permit will be needed from the Town for stream buffer disturbance on the Dutcher Parcel as a result of Stormwater drainage over the easement.

C.3 Surface Water Mitigation Measures

A Stormwater Management Report is included as Appendix 4. The hydrologic evaluation and subsequent stormwater management design for this project, focused on the locations where collected stormwater leaves the property. The The proposed stormwater runoff quantities for each storm event are provided in Table C.2-1 - *Post- Development Stormwater Runoff* and in Appendix 4 – Stormwater Management Report.

Table C.2-1 Post Development Stormwater Runoff

Drainage Design Point	1Yr.	2 Yr.	10 Yr.	25 Yr.	100 Yr.
	2.5 in.	**3.5 in.**	**5.0 in.**	**6.0 in**	**8.0 in.**
#1	5.83	13.17	29.10	49.49	90.60
#2	3.33	7.87	16.01	21.91	34.27

Source: Stormwater Pollution Prevention Plan (SWPPP) Hilltop Manor Subdivision (revised February 2010)

As shown in the Table, post-development peak stormwater run-off rates are below the peak rates analyzed for the existing (pre-development) run-off conditions, for each of the analyzed storm events.

The watershed design points become the point where the degree and type of mitigation is determined; as it is at this point that the surface runoff leaves the property and proceeds onto abutting lands. No houses, structures, or other appurtenant structures will be built within the limits of any 100-year flood boundary or low-lying area.

Stormwater drainage will be accomplished on-site by a series of pre-cast catch basins and connecting “HDPE” pipe placed in the road network and the interior of the site. The pipe sizes will range from 12” to 24”. Other features of the drainage system will be Stormwater Quality Management Basins and surface swales to facilitate stormwater movement and purification (first flush) of the point and non-point sources, including increased pollutant loading from roads, driveways and other impervious surfaces. The following stormwater management practices are proposed:

- Pond P-1 – Micro Pool Extended Detention Pond: This facility is located near the project entrance and will provide attenuation and water quality treatment.
- Pond P-2 – Micro Pool Extended Detention Pond: This facility is located in the approximate center of the development and will detain and treat run-off from the loop road.
- Pond P-3 – Pocket Pond: This facility is located on the eastern portion of the project site and will manage both stormwater quality and quantity (flow rates).

The facilites and design details are provided in the SWPPP (Appendix 4). The facilities were designed according to the NYS Stormwater Management Design Manual (2008). The project engineer, M. Gillespie & Associates, has received approval to design the project based upon the 2008 Design Manual in accordance with the NYSDEC transition policy (see coorespondence in Appendix 1). The SWPPP will meet all requirements of the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-10-001).

The Stormwater Quality Management Basins are designed to discharge via a controlled outlet structure and will incorporate landscaping to enhance biological activity for pollutant removal. The stormwater management facilities are designed in accordance with NYSDEC Phase 2 guidelines in order to mitigate the increases associated with stormwater design point #1 and #2. As designed, the net post-development peak stormwater discharge rates will be maintained below the pre-development peak levels for all storm events analyzed.

The proposed development is designed to integrate the existing runoff patterns and natural features into the planned residential subdivision. In addition, the natural features on-site will be used to provide environmentally preferred stormwater management mitigation by improving runoff quality through the use of open- channel/wetland filtration, absorption, and evaporation that are efficient cleansing measures utilized to pre-treat stormwater prior to it entering an existing drainage system.

Maintenance

Short term and long term maintenance of the stormwater management facilities are described in the SWPPP (Appendix 4). During construction the project owner and the general contractor selected by the owner will be responsible for all stormwater management facilities, including structures, pipes, ponds, and swales. A maintenance schedule is provided in the SWPPP.

Following construction, the road and the project's associates stormwater management facilities will be dedicated to the Town of East Fishkill. Upon acceptance, the Town of East Fishkill will be responsible for maintenance of all on-site stormwater management facilites. All components of the system have been contained in drainage and maintenance easements and will be fully accesible to the Town. A detailed maintenance schedule for long term nainteance is provided in the SWPPP.

Construction Stormwater Management

The SWPPP prepared for the project provides site specific stormwater management measures and a construction schedule. The following structural and planting measures are proposed during project construction:

- Temporary swales
- Silt Fencing
- Sediment Traps
- Stabilized Construction Entrance
- Rock Outlet Protection
- Dust Control

Figure IV.C.1-1: Pre-Development Analysis
Hilltop Manor Residential Subdivision
Town of East Fishkill, Dutchess County, New York
Source: M. Gillespie & Associates Consulting Engineers, PLLC.
NTS

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Figure IV.C.2-1: Post-Development Analysis
Hilltop Manor Residential Subdivision
Town of East Fishkill, Dutchess County, New York
Source: M. Gillespie & Associates Consulting Engineers, PLLC.
NTS

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