3.13 Utilities – Water

3.13.1 Proposed Water System

The project site will be served by the Village of New Paltz Water System, which obtains its water supply from a connection to the New York City Catskill Water Aqueduct. A pump station draws water from the Aqueduct to a water treatment plant (WTP) located one-quarter mile northwest of the Aqueduct near Mountain Rest Road in the Town of New Paltz. The Village also maintains four reservoirs in the vicinity of the water plant for back-up flow when water from the Aqueduct is not available.

Water is treated through one of three Trident Microfloc rapid sand filters, each of which is rated for a capacity flow of one million gallons per day (mgd). The permitted limit of the plant assumes that one of the filters will be off line at any given time; therefore, water flow capacity of the WTP is rated at two million gallons per day. The WTP also provides disinfection and pH adjustment for corrosion control. Treated water is piped to the Village of New Paltz Water Distribution System where it enters storage tanks for potable water and fire suppression; water storage capacity is 2.4 million gallons.

The WTP has excess water capacity based on monthly averages of daily flow and peak day flow between January 2003 and May 2005. The highest average daily flow was recorded in February 2005 at 897,200 gpd, and the highest peak daily flow was in October 2003 at 1.33 mgd, leaving excess water capacity at approximately 700,000 gpd based on worst case scenario peak daily flow.

3.13.1a SDEIS – Proposed Water System

There has been no change to the existing water system since the publication of the DEIS.

3.13.2 Potential Impacts

The Stoneleigh site will connect to the Village of New Paltz Water System via a 12-in. diameter line along Bonticou View Drive. A 12-in. line is necessary to service Stoneleigh and the Woodland Ponds site. The water line will enter the Stoneleigh site where an 8-in. diameter single line loop system will be installed to serve the site. A 12-in. line will continue across the site and service the Woodland Ponds site.

The proposed distribution system will consist of about 3,500 linear feet of Class 52, 8-in., cement-lined, ductile iron pipe complying with American Water Works Association (AWWA) Standards C151 and C104. Water mains will be pressure tested and disinfected with chlorine solution prior to installation.

The connections will conform to requirements defined in the New York State Sanitary Code 10 NYCRR Subpart 5-1, design standards in the "Recommended Standards for Water Works" by the Great Lakes Upper Mississippi River Board of State Public Health & Environmental Managers, 1997, also known as the "Ten States Standards for Water", and the National Fire Protection Association (NFPA) standards for fire protection.

Water lines will be installed 48 inches to 60 inches below grade and will generally be located on one side of the roadways. Hydrants and valves will be installed as per Ten State Standards. The Ulster County Department of Health (UCDOH) will be responsible for review of the water systems.

The project water demand is the same as the wastewater projected flow presented in section 3.13.1; 72,000 gpd (avg.).

Water Pressure

Data provided by the Village Engineer and Chazen Companies suggest the static residual pressure at Bonticou View Drive is 80-100 psi. The highest floor elevation at the site is about 330 ft EL and the connection at Bonticou View Drive is at 275 ft EL for a difference of 55 ft or 25 psi +/-. With residual pressure at 80 psi, a drop of 25 psi results in a site pressure of 55 psi. Ten State Standards recommends normal working pressures of 35 psi. Therefore, no intermediate pressure booster stations are needed and the site will have a working pressure of 55 psi up to 70 psi in some areas particularly on the south side, which is at elevation 280-300 ft EL.

Fire Flow

Fire flow water demand requirements are based on National Fire Protection Association (NFPA) 13 and ISO Guide for Determination of Needed Fire Flow (08-2005 editions.). NFPA Section 11.2.2 table 11.2.2.1 recommends fire flow for ordinary hazard classifications is between 850 and 1,500 gpm at 60 to 90 minutes. ISO is used to calculate the flow based on construction class and classification. The calculation below determined the fire flow to be 1,000 gpm. Therefore, the recommended fire flow is 1,000 gpm for this application.

Assumptions:

- 1,000 S.F. exposure
- Sprinklered buildings
- 30’ separation, minimum
- Frame construction Class 1 use F = 1.5
- Residential use, habitational occupancy, limited combustibility Class 2, Oi = 0.85

Where:
Ci = Factor related to type of construction (see below). Round to the nearest 250.
Oi = Factor related to type of occupancy (0.85)
X = Factor related to exposure of buildings
P = Factor related to communication between buildings

Where:
F = Frame construction Class (Class 1, F = 1.5)
Ai = Effective area:

- Assume acceptable division wall (one-hour fire rating) between units.
- Assume 1,000 S.F. per unit, 2 floors per building.
- Effective Area = 100% 1st Floor + 50% 2nd Floor

Ai = 1,000 + 0.5(1,000)
Ai = 1,500

Use:
Ci = 1,000 (to nearest 250)

[1+(X+P)i] = Exposure & Communication Factor

Where:
X depends on:

- Construction class and the product of length of wall in feet, and height of building in stories
- Assume 30 feet distance between buildings, end to end and side to side.
- 25 ft width x 6 units x 2 stories = 300
- From Table 330A ISO 08-2005 Edition: X = 0.19
- Assume no communication between building units. (i.e.: continuous firewall). P = 0

Round to nearest 1,000 GPM = **1,000 GPM.**

3.13.2a SDEIS - Potential Impacts

The daily Revised Project water demand is 40,960 gpd (avg.), which is the same as the wastewater projected flow presented in section 3.12.2a.

56 two-family units (all 3 bedroom) @ 400 gpd 56 x 400	=	*22,400 gpd*
60 single family units (all 3 bedroom) @ 400 gpd 60 x 400	=	*24,000 gpd*
24 unit senior complex		
8 units (2 bedroom) @ 150 gpd per bedroom, 8 x 2 x 150	=	*2,400 gpd*
16 units (1 bedroom) @ 150 gpd per bedroom 16 x 1 x 150	=	*2,400 gpd*
Less 20% reduction for water saving fixtures		*(10,240) gpd*
Total Water Flow		*40,960 gpd*

As a result of changes in the Revised Project and the elimination of the collaboration with Woodland Ponds, the water supply system will now connect to the Village of New Paltz Water System via an 8-in. diameter water line (versus a 12-in. line) along Bonticou View Drive. The water line will enter the Revised Project site where an 8-in. diameter internal loop system will be installed to serve the site. The Project Sponsor proposes to replace the existing 6-in water line from the intersection of NYS Route 32 and Mulberry Street to the end of Bonticou View Drive (approx 3,500 lf) with an 8-in water line. Along the proposed water main route, 33 parcels align both sides of Bonticou View Drive and 14 align both sides of NYS Route 32.

The updated distribution system will now consist of about 5,500 linear feet of Class 52, 8-in., cement-lined, ductile iron pipe complying with American Water Works Association (AWWA) Standards C600 and C104. Water mains will be pressure tested and disinfected in accordance with AWWA Standards C600 and C651 prior to activation and connection to the Village System.

The extension and new service connections will continue to conform to the Village of New Paltz and the Ulster County Department of Health approval.

Based on conversations with the Village Engineer, full replacement of the existing water main will be necessary, as the water main in Bonticou View Drive is in need of repair and has had recent breaks. The new 8" water main will be constructed in its entirety, pressure tested, disinfected, and pressurized before any connections can take place.

Typically, about 100 feet of water line can be installed per day. Construction duration may vary depending on weather, utility interferences and complexity for the transferring of services. Trenches in the streets shall not be left open during non-working times, but would either be filled and patched, or covered with steel plates. Work along NYS Route 32 will be completed in accordance to NYSDOT requirements, including the preparation of any required Maintenance and Protection of Traffic (MPT) Plans. The Contractor will coordinate with the adjacent property owners in accommodating driveway access issues, as it is likely that the driveways along the side of the road in which the water main is to be installed will be impacted during approximately one day's construction. The final design shall outline the field conditions, end result and performance requirements and will be completed during the Site Plan Approval Process.

This work typically involves the use of backhoes to excavate the trenches and place the backfill, and cranes to lift the water lines into place. Flatbed delivery trucks are used to transport the lines to the site. Dump trucks would bring the bedding material and clean fill, if needed, to the work site. Asphalt trucks and rollers would be used to patch the streets. The installation of the water line would require about 4 to 5 workers and about one truck delivery per day.

It is expected that service connections to the adjacent property owners will need to be transferred to the new water line after the new line's installation has completed. Each connection to an adjacent user will take approximately ½ of a day. Adequate notice will be provided to all adjacent property owners. This is the only expected time any adjacent property owners will not have use of water.

After the installation of the new water line is completed, and the line has been satisfactorily tested and disinfected, the existing water services will be cut and connected to the new curb boxes.

Water Pressure

Data provided by the Village Engineer and The Chazen Companies suggest the static residual pressure at Bonticou View Drive is 80-100 psi. The highest floor elevation at the site is about 287 ft EL and the connection at Bonticou View Drive is at 275 ft EL for a difference of 12 ft or 6 psi +/-. With residual pressure at 80 psi, a drop of 6 psi results in a site pressure of 74 psi. Ten State Standards recommends minimal normal working pressures of 35 psi. Therefore, no intermediate pressure booster stations are needed and the site will have a working pressure of 74 psi up to 86 psi in some areas particularly on the south side, which is at elevation 260-270 ft EL.

Fire Flow

Fire flow water demand requirements are based on the International Organization for Standardization (ISO) Guide for Determination of Needed Fire Flow (08-2005 editions). ISO is

used to calculate the flow based on construction class and classification. There are three types of facilities on site: the 24 unit facility, duplexes, and single family units. The summary table and calculations, below, show the fire flow demand for each facility. The building with the highest fire flow demand will be used as the total fire flow demand for the site, shown in gallons per minute.

	24 Unit Building	*Duplexes*	*Single Family*
Effective Area (A) in s.f.	*15,465*	*1,800*	*1,800*
Factor Related to Type of Construction (C)	*3500*	*1,250*	*1,250*
Factor Related to Exposure of Buildings (X)	*0*	*0.17*	*0.08*
Needed Fire Flow (NFF) in gpm	*3000*	*1250*	*1150*

Assumptions:

- *10,310 S.F. area for the 24 unit facility*
- *1,200 S.F. area for the duplexes*
- *1,200 S.F. area for the single family units*
- *The 24 unit facility is a sprinklered building*
- *Frame construction Class 1 use F = 1.5*
- *Residential use, habitational occupancy, limited combustibility Class 2, Oi = 0.85*

Where:
$NFF = (Ci)(Oi) \times (1 + (X+P))$

Where:
NFF= Needed fire flow in gallons per minute (gpm)
C = Factor related to type of construction (see below). Round to the nearest 250.
O = Factor related to type of occupancy (0.85)
X = Factor related to exposure of buildings
P = Factor related to communication between buildings
Where:
F = Frame construction Class (Class 1, F = 1.5)
A = Effective area:

- *Effective Area = 100% 1st Floor + 50% 2nd Floor*

$$A_1 = 10,310 + 0.5(10,310)$$
$$\mathbf{A_1 = 15,465}$$

$$A_2 = 1,200 + 0.5(1,200)$$
$$\mathbf{A_2 = 1,800}$$

$$A_3 = 1,200 + 0.5(1,200)$$
$$\mathbf{A_3 = 1,800}$$

Where:
$C = 18 \times (1.5) \times (Ai)^{0.5}$:

C_1 = 18 x (1.5) x (15, 465)$^{0.5}$ = 3500 (rounded to the nearest 250)

C_2 = 18 x (1.5) x (1,800)$^{0.5}$ = 1,250 (rounded to the nearest 250)

C_3 = 18 x (1.5) x (1,800)$^{0.5}$ = 1,250 (rounded to the nearest 250)

Where:
[1+(X+P)] = Exposure & Communication Factor

X depends on:

- *Construction class and the product of length of wall in feet, and height of building in stories*
- *Length-height value for single family homes: 40 ft width x 2 stories = 50*
- *Length-height value for duplexes: 50 ft width x 2 stories = 100*
- *A 20' separation, minimum between the single family unit and the closest neighboring facility*
- *A 65' separation, minimum between the duplex and the closest neighboring facility*
- *No exposure for the 24 unit facility (X = 0)*
- *From Table 330A ISO 08-2005 Edition:*

  X_1 = 0

  X_2 = 0.17

  X_3 = 0.08

- *Assume no communication between building all facilities. (i.e.: continuous firewall). P = 0 for all facility types.*

Therefore,

NFF_1 = 3500 x 0.85 x 1 = 3,000 GPM

NFF_2 = 1250 x 0.85 x (1+0.17) = 1,250 GPM

NFF_3 = 1250 x 0.85 x (1 + 0.08) = 1,150 GPM

Therefore, the building with the highest fire flow demand will be the 24 unit facility with a needed fire flow (NFF) of 3,000 GPM. This figure was used in the above calculation of overall pipe size needed for the Revised Project. The 8-in proposed water line will accommodate the fire flow and water pressure needed for the Revised Project.

3.13.3 Mitigation Measures

Any new water infrastructure proposed to be provided beyond the existing public system is planned to be private, at the request of the Village Engineer. A New York State Transportation Corporation is proposed to be established to manage the operation and

maintenance of new water lines that would be proposed to connect with the existing public water line on Bonticou View Drive.

In the condominium units double headed sprinkler systems will be provided, with the upper sprinkler unit providing fire suppression between floors, and the lower sprinkler unit providing suppression within the living space of the apartment unit itself. This is based on the requirements of the New York State Building Code for wood framed structures.

Water Quality

Water quality data is registered quarterly by the Village in accordance with UCHD requirements. The municipal water quality is deemed acceptable by the Village. During construction, installation of new lines will be disinfected as per applicable AWWA standards prior to being put into service.

In order to supply the proposed Woodland Pond site and Stoneleigh with adequate water, the existing 6-in. diameter water line at the intersection of NYS Route 32 and Mulberry Street to the end of Bonticou View Drive will need to be replaced with a 12-in. line at a cost of $550,000 (4000 ft @ $137/foot).

The UCHD will oversee the design of the proposed system and corrections on behalf of the NYS Dept. of Health.

3.13.3a SDEIS - Mitigation Measures

In order to supply the Revised Project with adequate water and to ensure that there is no reduction in water pressure or volume to existing residences along the line and eliminate any potential adverse impacts to the existing service, the existing 6-in. diameter water line at the intersection of NYS Route 32 and Mulberry Street to the end of Bonticou View Drive will need to be replaced with an 8-in. line.

The method of construction and installation of the proposed water main will comply with review comments made by the Village Engineer during the Site Plan Approval process and will follow typical protocol for water main upgrade. A construction and installation schedule will be determined during Site Plan Approval for the duration and methods of construction. Along the proposed water main route, 33 parcels align both sides of Bonticou View Drive and 14 align both sides of NYS Route 32.

The use of water saving fixtures within the Revised Project lessens the overall water and sewer usage by 20% reduction or 10,240 gpd. These reductions are seen in the calculations above.