

### **3.13 Utilities - Water**

#### **3.13.1 Proposed Water System**

The Legacy Ridge residential development is proposed to be serviced with central water provided by the Town of Woodbury Consolidated Water District (WCWD). The WCWD supplies potable water to a portion of the Town of Woodbury and is comprised of the following:

- 2.65+ million gallons of water storage divided between the following:
  - 1.0 million gallon Summit Ave. Tank
  - 200,000 gallon Summit Ave. Tank
  - 500,000 gallon Weygant Hill Storage Tank
  - 500,000 gallon Overlook Storage Tank
  - 350,000 gallon Earl Reservoir
  - 100,000 gallon Skyline Tank
- Five (5) potable water supply wells located off Adams Street
- Three (3) water booster stations (Birchwood, Townsend & Weygant Hill)
- Ductile iron and cast iron water mains ranging from 12" to 4" in diameter

A looped system is promoted within Legacy Ridge and the WCWD in order to help balance the piping network and reduce friction losses. The Legacy Ridge water system will connect to the WCWD at three locations. The connections will reduce the existing system's vulnerability and provide a much needed benefit to the WCWD. The most significant benefits are: 1) providing the Skyline System (north of the Ridge Rd/Skyline Dr intersection) with adequate storage for fire fighting and increased pressure for consumptive use 2) providing the WCWD with an increased storage capacity 3) providing the Summit/Overlook portion of the WCWD with a second location for supply, which improves the systems reliability. For a detailed description of the Legacy Ridge water system, refer to the water system report included in Appendix 9.6 for a detailed description of the proposed improvements associated with Legacy Ridge.

The Town of Woodbury requires a minimum pressure of 45 psi at street grade under average flow conditions and 20 psi during fire flow conditions. The topography on the developed portion of the Legacy Ridge site ranges between elevations 810 and 370. It is speculated that a total of three (3) pressure zones will be included in Legacy Ridge. Water booster stations and storage tanks will be installed and utilized, as necessary, to meet the required pressure for each zone. These zones are identified as High, Intermediate and Low and are described in the proceeding section. A summary of the Legacy Ridge system water demands and storage requirements is summarized in Table 43 below.

Table 43 - Summary of Water System Demands & Storage Requirements	
Average Daily Demand =	97.2 gpm
Maximum Daily Demand =	157.9 gpm
Needed Fire Flow (2-hr duration) =	1000.0 gpm
Total System Demand =	1157.9 gpm
Minimum Storage Required =	260,000 gallons

The Town of Woodbury requires that the water supplied must exceed the demand for the Legacy Ridge development

### 3.13.2 Potential Impacts

Two (2) proposed on-site storage tanks, LR Tank #1 and LR Tank #2, and the existing Skyline Tank will supplement water to the Legacy Ridge water system as well as the existing WCWD. Refer to Appendix 1 of the Water System Report for a location of both tanks. A specification and a detail of a typical storage tank are included in Appendix 3 of the Preliminary Water System Report. The tanks will be installed at different elevations in order to keep on-site pressures within the range of 45-100 psi under average daily flow conditions. According to the Ten States Standards, pressures within the system should stay within the range of 35-80 psi. All homes receiving a pressure greater than 90 psi should be provided with private pressure reducing valves. High pressure zones (>80 psi.) within Legacy Ridge will be identified upon completion of a water model analysis. Homes located within the high pressure zones will be provided with pressure reducing valves.

Three (3) pressure zones have been identified in the proposed Legacy Ridge Water System. The table below offers an outline of the characteristics of each pressure zone.

Table 44 – Legacy Ridge Water System, Pressure Zones				
Zone	Maximum Elevation	Minimum Elevation	Storage Tank Pressurization	Pump Pressurization
High	860	745	LR Tank #1	LR Booster Station
LR High	745	610	LR Tank #1	LR Booster Station
LR Intermediate	610	495	Skyline Tank	LR Supply Wells
LR Low	495	390	LR Tank #2	LR Supply Wells

LR Tank #1 will be located in the northwest portion of parcel 3-1-11. LR Tank #1 will receive potable water from one of two sets of pumps located in the LR Water Booster Station situated in the southwest corner of Legacy Ridge. As indicated Appendix 2 of the Water System Report, the minimum requirement of LR Tank #1 is approximately 130,000 gallons to provide storage for a 2-hour fire event and one day of average daily flow to the 18 homes of the Legacy Ridge High Zone. At a proposed volume of nearly 300,000 gallons, Tank #1 provides an added storage capacity of approximately 170,000 gallons. This added capacity serves as a pure benefit to the Town.

LR Tank #1 measures approximately 42' diameter x 28' sidewall height and stores over 294,000 gallons of potable water. This tank is oversized by 130% to provide additional storage capacity and reduce the vulnerability of the WCWD. The overflow elevation will be situated at elevation 975.00, as requested by the Town of Woodbury. Placing LR Tank #1 at such an elevated position will provide Skyline System north of the Riegel Rd/Skyline Dr intersection with fire flow and increased pressure for consumptive use. Another benefit of placing the tank at an elevation 975 is it provides relief for the Birchwood Booster Station. Please refer to Figure 110 for a plan showing the modifications to the existing water district and affected parcels.

The LR Tank #2 will receive potable water from the supply wells. LR Tank #2 will be located in the southwest corner of parcel 3-1-12.5 in the open space behind subdivided lot 49 LR Tank #2 is sized to storage for a 2-hour fire event and one day of average daily flow to the 194 homes of the Legacy Ridge Low Zone. LR Tank #2 measures 45' diameter x 19' sidewall height and stores approximately 210,000 gallons of potable water. At the request of the Town of Woodbury, the LR Tank #2 overflow elevation will be situated at 725.00 and will float off the Summit/Overlook system. Refer to Appendix 1 of the Preliminary Water System Report for a location of the existing WCWD storage tanks and the proposed modifications to the water districts.

The existing 100,000 gallon Skyline Tank will provide the 75 homes in the LR Intermediate Zone and the portion of the Skyline system south of the Riegel Rd./Skyline Dr. intersection with storage for consumptive use. Potable water will be pumped into the Skyline Tank via a new set of pumps located in the proposed LR Water Booster Station. The overflow in the Skyline Tank (elevation = 861.25) will remain unchanged. Fire flow storage will be provided by the LR Tank #1. A pressure reducing valve will be implemented to allow sacrificial relief from LR Tank #1 under emergency conditions.

The construction of the proposed Legacy Ridge water system will provide much needed support to the existing WCWD. Connections can be completed during off-peak hours to minimize possible water main interruption. Pressure reducing valves may need to be installed in order to protect off-site systems from high pressures. Refer to Appendix 1 of the Preliminary Water System Report for a location of the proposed connection points.

Studies completed in the area indicate that high yielding sand and gravel deposits are found within the Trout Brook valley and the nearby Woodbury Creek valley, and the Project Sponsor proposes to locate the production wells in this location. A hydrogeologic investigation of this area has been completed which included the installation of a series of borings, test wells, and aquifer testing. The hydrogeologic investigation indicates that adequate groundwater resources are present in this area.

Based on the existing data the highest potentially yielding area is the sand and gravel aquifer associated with Woodbury Creek. The preliminary subsurface investigation confirmed the previous data for this site that was obtained during a Town wide water supply investigation that was conducted in the mid-1980's. The previous study included installation of 16 test wells in the Town and the most promising location was identified as the Sweet Clover Farm site (TW-14A) located off Route 32. Several borings as part of the preliminary subsurface investigation were completed in this area in May 2005 to confirm these results and based on this data a large diameter test well (LRTW-01) was installed and developed at this location. The test well is a 39 foot 14-inch diameter double cased well with 10 feet of high capacity stainless steel screen that was constructed according to NYSDOH

requirements for water supply wells. Subsequently, a 72-hour pump test was conducted on the test well to prove the long term safe yield of this well and to collect additional hydrogeologic and water quality data. The 72-hour test was conducted at a constant rate of 210 gallons per minute, during the test the drawdown in the test well quickly stabilized and the specific capacity of the well is just over 18 gpm/ft of drawdown. Based on the specific capacity and long term drawdown projections the recommended pumping rate is approximately 290 gpm while maintaining the water level 5 ft over the top of the screen at 29 feet. In addition to monitoring the drawdown in the test well water level data was also continuously recorded in the nearby monitoring well, several residential wells, and Woodbury Creek both upstream and downstream of the test well site. With the exception of the nearby monitoring well all other monitoring points did not exhibit any significant changes that could be attributed to the 72-hour test. It is highly unlikely that permanent production wells in this area would impact the existing Town production wells or the nearby residential wells.

To supplement the newly constructed well and to provide additional yield a second test well (LRTW-02) was installed in the former quarry located just east of Route 32. This test well is a 46 foot 14-inch diameter double cased well with 10 feet of high capacity stainless steel screen that was constructed according to NYSDOH requirements for water supply wells. The 72-hour test on LRTW-02 was conducted at a constant rate of 119 gpm and the specific capacity of this well is 6.6 gpm/ft. The recommended pumping rate for this well based on the specific capacity and long term drawdown projections is approximately 120 gpm while maintaining the water level 5 feet over the top of the screen at 36.2 feet.

The final test well (LRTW-04) was installed in a similar fashion in a location north of LRTW-02 to a total depth of 46 feet. The 72-hour test on LRTW-04 was conducted at a constant rate of 39 gpm and the specific capacity of this well is approximately 3 gpm/ft. Based on the testing data the recommended pumping rate for this well is 34 gpm on a long term basis.

The total developed capacity of the three new test wells at the recommended pumping rates is 444 gpm which equates to 639,360 gpd which is in excess of the anticipated combined demand for WP3 and the Legacy Ridge development. Based on the positions of the three test wells it is not anticipated that they will interfere with each other, any of the other nearby residential wells, or the existing Town production wells.

A full set of water quality samples were collected near the end of the 72-hour tests on the three test wells. A summary of the results received from the NYSDOH certified laboratory (Appendix 9.24) indicates the water quality at each of the test well locations is excellent and none of the established maximum contaminant levels (MCLs) were exceeded for any of the parameters that were analyzed. A final determination on the water treatment needs (if any, beyond disinfection) will be made based on a final review of the entire water quality data set.

All treatment for the new supply wells will occur at the groundwater source. Raw water from the proposed supply well(s) must be disinfected in accordance with the Recommended Standards for Water Works © 2003 (a.k.a. Ten States Standards) and local requirements. The water system improvements will have no impact on existing water treatment.

The Town of Woodbury will be responsible for the operation and maintenance costs (O&M costs) of the proposed modifications to the WCWD. Infrastructure costs will be paid for by the project sponsor. Infrastructure costs may include the construction of supply wells, water treatment plant, water storage, and water distribution system and appurtenances including

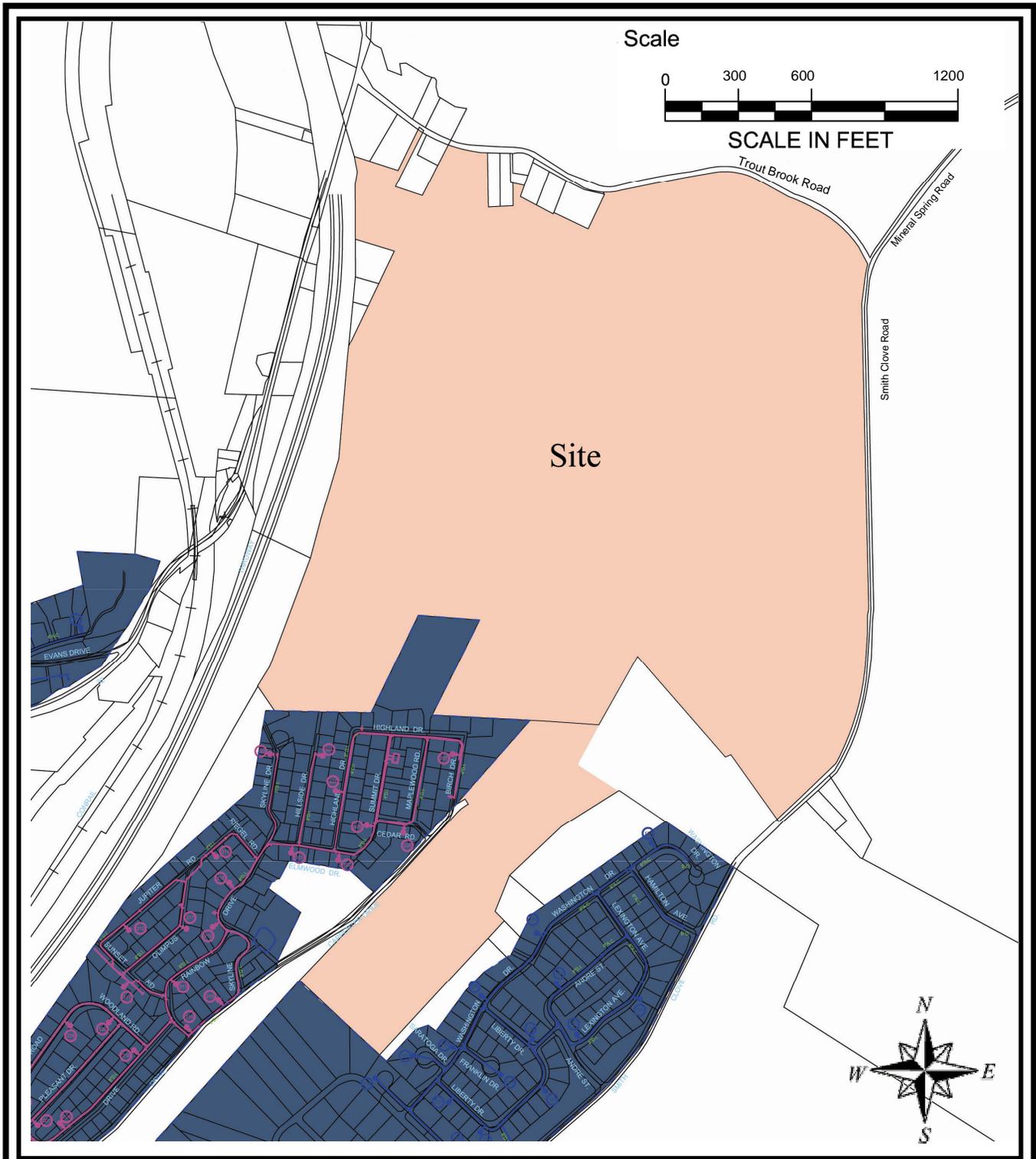
all labor and restoration. A cost estimate of the water system improvements will be completed upon determination of water quality and other cost-affecting factors.

***R-2A CLUSTER vs. R-2 CONVENTIONAL ZONING vs. R-3 CONVENTIONAL ZONING***

The Legacy Ridge site is currently zoned as R-3A Conventional. A request to rezone Legacy Ridge as R-2A Conservation Cluster has been presented. Rezoning Legacy Ridge as R-2A Conventional was also contemplated. Under R-3A zoning, the development would result in 155 lots. Under R-2A Conventional, the development would result in 233 lots. Assuming the homes in each scenario would be four-bedroom units, approximately 74,000 gpd of water would be necessary for 155 homes (under R-3A) and 111,000 gpd would be necessary for 233 homes (under R-2A). This is less than the average daily flow of 140,000 gpd that will be needed by the proposed 287 homes in Legacy Ridge under R-2A Cluster.

The Legacy Ridge site will require a larger water supply under R-2A Cluster zoning when compared to R-2A Conventional and R-3A Conventional. However, if a surplus of water supply is provided to the Town, then the impact to the existing WCWD would be beneficial. Hydrological information and existing test data indicates that ample sources of water likely exist in the Trout Brook Valley.

This additional increased storage capacity and a new groundwater source would have great value to the Town of Woodbury. The costs of developing such increased resources have been estimated to be \$3.4M. This is a cost that is justifiable for a 287 unit project, but not justifiable for a 155 unit project under R-3A zoning or a 233 unit project under R-2A Conventional zoning. Under the proposed Conservation Cluster of 287 homes, this equates to \$12,100 per home. With only 155 homes under the current R-3A zoning, this cost increases to \$21,900 per home. With only 233 homes under the R-2A Conventional zoning, this cost increases to \$14,600 per home. The development is likely unworkable under the alternative zoning. The alternative of individual wells for each lot within the project site would appear to be the more appropriate resolution for the smaller project.



One Blue Hill Plaza  
 Pearl River, NY 10965  
 phone: 845-735-8300  
 fax: 845-735-7466  
 website: [www.hdrinc.com](http://www.hdrinc.com)

**Legacy Ridge  
 at Highland Mills**  
 Trout Brook Road  
 Town of Woodbury  
 Orange County, New York

Source: WWTP Report, as prepared by HDR/LMS

**Figure 110**

**Town of Woodbury  
 Water Districts**

April 11, 2006

### 3.13.3 Mitigation Measures

The following are proposed to offset the potential impacts of the preferred plan:

- Development and dedication to the Town of a new groundwater supply source to meet or exceed the water demand estimated from the Legacy Ridge project;
- Construction and dedication to the Town of 2 new water storage tanks to address storage capacity system-wide;
- Connection of the new Legacy Ridge system into the Town system in multiple locations to address pressure concerns system-wide;
- Adequate storage capacity for the Legacy Ridge development will be located on-site as shown on Appendix 1 of the Preliminary Water System Report.

To ensure the water supply and storage system is developed to the highest standards, the following will be implemented as part of final design:

- A model analysis will be performed on the Legacy Ridge water system to determine if pressure and delivery within the current WCWD would be impacted by the Legacy Ridge project. The Legacy Ridge water system of booster pumps, storage tanks and pressure reducing valves will be revised, if necessary to minimize such impacts.
- The water model analysis will be performed on the proposed water system to confirm and assure that the improvements meet the required fire flow pressures.
- The off-site and on-site improvements, including but not limited to water treatment, water supply, water storage, and water distribution system and appurtenances, will be designed in accordance with all applicable state and local regulations and specifications.
- Improvements to the WCWD will be designed in accordance with the *Recommended Standards for Water Works* © 2003 (a.k.a. Ten States Standards) and local requirements.
- Water booster stations will be designed and installed to confine both on-site and off-site pressures within the required range.
- Hydrants or blowoffs will be installed at dead ends in order to achieve flushing.
- The Town of Woodbury will map and discuss the proposed modifications to the water district and the affected parcels should the Town decide to include this parcel within the water district.

During construction of the system, the following mitigation measures will be implemented:

- Frequent inspection of water system construction will ensure proper installation.
- An appropriate traffic control plan will be provided and executed during construction.
- Remote telemetry will be provided in accordance with town specifications to monitor the proposed water system improvements.

The proposed Legacy Ridge Water System will connect to the Town of Woodbury's Consolidated Water District (WCWD) in four locations. Each connection point provides a benefit to the WCWD as noted in the following descriptions:

Connection Point #1 – Proposed water system pressurized by Legacy Ridge Tank #2 (HGL 725.00) will connect to the Summit/Overlook system along Hamilton Avenue. The 210,000 gallon Legacy Ridge Tank #2 will provide the Summit/Overlook system with additional fire flow capacity and increased reliability under emergency conditions (i.e. water main break, fire event). This connection will also create a looped system which will help balance system pressures in the Summit/Overlook system.

Connection Point #2 – Proposed water system pressurized by the 290,000 gallon Legacy Ridge Tank #1 (HGL 975.00) will connect to the Skyline Drive system along Highland Drive. Via this connection, the Legacy Ridge Tank #1 will provide the Skyline water system north of the Riegel Road/Skyline Drive intersection with increased pressure and fire flow capability. The water booster station that currently serves this portion of Skyline's system will no longer be required as a result of this connection.

Connection Points #3 & 4 – A water main extension is proposed from the Legacy Ridge Water Booster Station to the Skyline Tank (HGL 861.25) located on Summit Drive. This connection will deliver potable water from Legacy Ridge system to the Skyline Drive Tank. An additional water main extension is proposed from the Skyline Tank to the existing water main on Skyline Drive just south of the Riegel Road intersection. These connections allow the Skyline Drive System to operate off the more reliable gravity tank feed rather than pumped feed from the Birchwood Avenue P.S. The Birchwood Ave P.S. would remain on-line as a secondary means of water supply. A new Birchwood P.S. by-pass line will permit the flow of water from the Skyline System to the Summit-Overlook System during emergency conditions.

### **3.14 Utilities – Solid Waste**

#### **3.14.1 Existing Solid Waste Services**

Removal of solid waste and recyclables in the Town of Woodbury is currently performed by a private carter.<sup>89</sup> A refuse tax is collected by the Town of Woodbury who contracts with the carter. As a private, gated community, the homes in Legacy Ridge would not have their refuse service provided by the Town of Woodbury and therefore would not be assessed a tax revenue for solid waste services.<sup>90</sup> The existing solid waste service facility which serves the Town of Woodbury is County Waste. Mr. Gil Houk, the corporate development representative of County Waste in Clifton Park, NY confirmed that they would be able to provide the same solid waste and recyclable services for the Legacy Ridge Homeowner's Association.<sup>91</sup> The service currently provided consists of once a week garbage pickup and recyclable pickup every other week, depending upon the material. Several other companies are available to provide the same service for the Homeowners Association.<sup>92</sup> The carting

---

<sup>89</sup> Personal communication between Sheila Beetle, Town of Woodbury Refuse Department and Ms. Barbara Gerlach, LMS Engineers, LLP, March 2, 2005.

<sup>90</sup> Personal communication between Sheila Beetle, Town of Woodbury Refuse Department and Ms. Barbara Gerlach, LMS Engineers, LLP, March 2, 2005.

<sup>91</sup> Personal communication between Gil Houk, County Waste and Ms. Barbara Gerlach, LMS Engineers, LLP, March 2, 2005.

<sup>92</sup> Personal communication with Steve Reville of Royal Carting Service Co. and Ms. Barbara Gerlach, LMS Engineers, LLP,