

**WELLHEAD PROTECTION PLAN**

**for the**

**VILLAGE OF CAZENOVIA WATER SUPPLY**  
**MADISON COUNTY, NEW YORK**

**SEPTEMBER 2007**

**Prepared by:**

**Steven Winkley**  
**New York Rural Water Association**



**TABLE OF CONTENTS**

	Page
1.0 Introduction .....	1
2.0 Water Supply Wells and Hydrogeologic Setting .....	1
3.0 Wellhead Protection Area .....	4
4.0 Present and Future Land Use .....	7
5.0 Water Supply Protection Strategy .....	11
 Figures	
1. Well Supply Location .....	2
2. Hydrogeologic Setting .....	3
3. Aquifer Potentiometric Surface .....	5
4. Composite Zone of Contribution .....	6
5. Wellhead Protection Area .....	8
6. Land Use Within the Wellhead Protection Area .....	9
7. Likely Developable Areas in the Wellhead Protection Area .....	10
8. Impervious Surfaces in the Wellhead Protection Area .....	12
9. 1887 Panoramic Map of Cazenovia .....	13
 Tables	
1. Village of Cazenovia Public Supply Well Data .....	1
2. Calculated Aquifer Transmissivity Values .....	4
3. Extent of Impervious Surface Area in Wellhead Protection Area .....	11
 Appendices	
Appendix A Proposed Village Wellhead Protection Overlay District .....	14
Appendix B Proposed Town Wellhead Protection Overlay District .....	26
Appendix C Calculation of Groundwater Recharge Volume .....	38

## 1.0 INTRODUCTION

The Village of Cazenovia currently utilizes three drilled wells for its source of water supply. This Wellhead Protection Plan, prepared by New York Rural Water Association (NYRWA), is designed to help protect and preserve these sources of drinking water. The plan maps the wells' critical wellhead protection area, documents land use, and develops a protection strategy. The protection and preservation of these sources of drinking water are of utmost importance to ensure a continued reliable, high-quality, and affordable water supply for the residents and businesses of the Cazenovia area.

## 2.0 WATER SUPPLY WELLS AND HYDROGEOLOGIC SETTING

The Village of Cazenovia's current production wells, hereafter referred to as Well 1, Well 2, and Well 3, are located on a 9-acre parcel owned by the Village off Chenango Street in the Village of Cazenovia (see Figures 1 and 2). The primary water supply source for the Village is Well 3, completed in 1988. Table 1 is a summary of well details for these supply sources.

Well	Year Constructed	Diameter (inches)	Well Depth (feet)	Open Screened Interval (feet below ground)	Well Design Capacity * (gallons per minute)
Well 1	1945	10	79.2	69 - 79.2	450
Well 2	1945	6	77.3	68.6 - 77.4	360
Well 3	1988	12	80	54 - 80	850

\* Based upon the maximum recommended screen transmitting capacity at an entrance velocity of 0.1 ft/sec.

**Table 1. Village of Cazenovia Public Supply Well Data.**

The supply wells produce ground water from an unconsolidated sand and gravel aquifer that was deposited during deglaciation of the region. NYRWA compiled subsurface information for this aquifer and has mapped the areal extent of the aquifer based upon soils data, topographic expression, well data, and site reconnaissance (see green boundary line on Figure 2). This valley-fill aquifer consists of coarse-grained sand and gravel deposits overlain locally by clayey and gravelly deposits that resemble glacial till.

NYRWA reviewed pumping tests conducted in 1988 and in 2000 on Well 3. Analysis of data from these tests indicates that the calculated *transmissivity* of the aquifer ranges from 29,464 gpd/ft to 82,500 gpd/ft, with a geometric mean value of 56,093 gpd/ft (see Table 2).

Transmissivity is the capacity of the aquifer to transmit water. With a mean saturated thickness of 26 feet, the mean hydraulic conductivity of the sand and gravel was calculated to be 288 feet/day. This value is consistent with published values for fine to coarse sand and gravel.

Unfortunately, no drawdown data from any observation wells was found to exist. Therefore, the aquifer storativity could not be calculated. Based upon the subsurface stratigraphy, the aquifer is likely under semi-confined to confined conditions in the vicinity of the supply wells. However, like most buried valley aquifers, the aquifer is likely in hydraulic connection with surficial deposits occurring along the valley wall (in this case, southeast of the supply wells).



# Village of Cazenovia Supply Wells

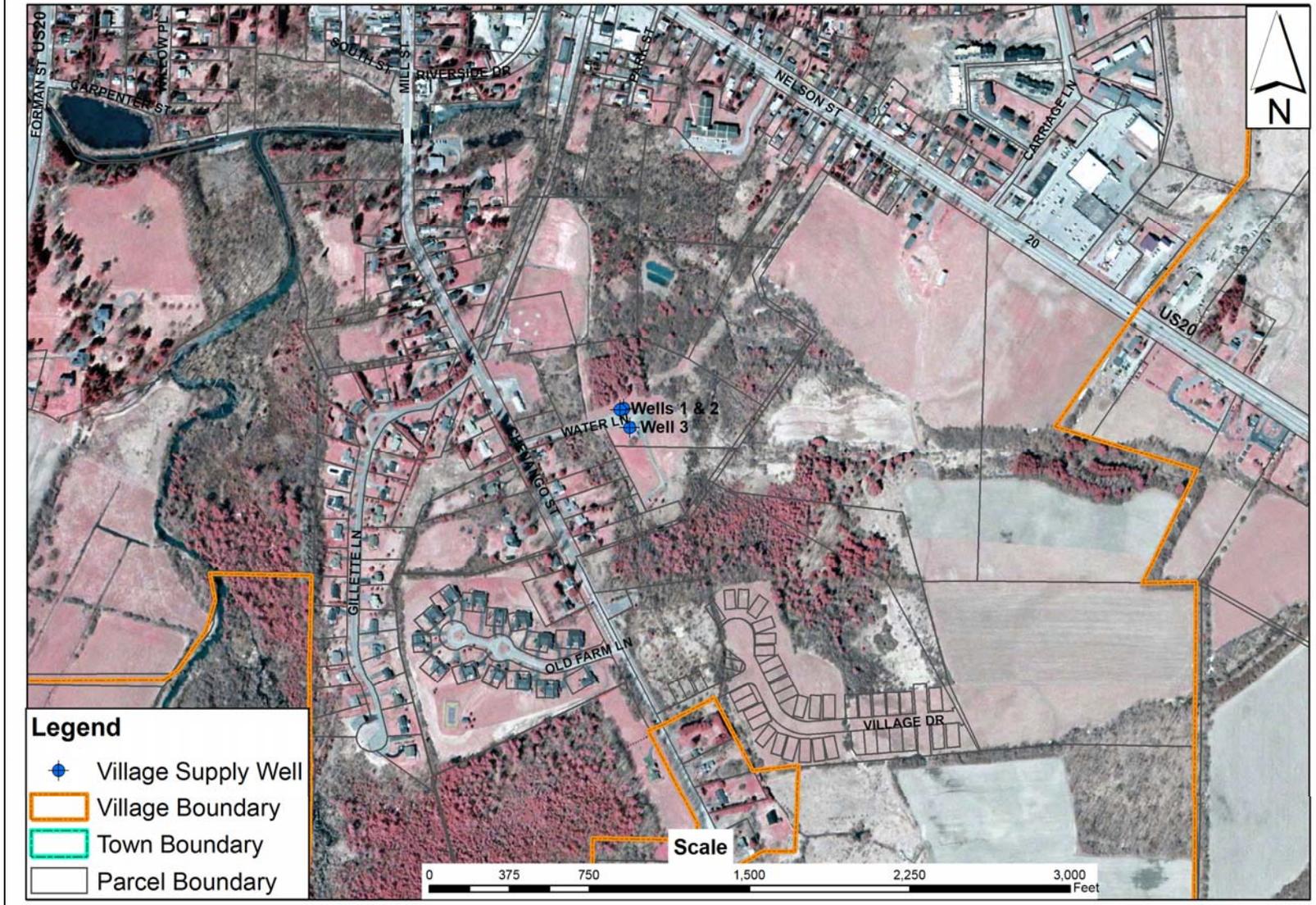


Figure 1. Well Supply Location



Test	Rate (gpm)	Analysis Method	Transmissivity (gpd/ft <sup>2</sup> )
1988	420	Jacob	73,920
1988	745	Jacob	61,463
1988	420	Theis	71,600
1988	745	Theis	82,500
1988	718*	Recovery	49,882
2000	625**	Jacob	29,464
2000	625**	Theis	44,300

\* composite pumping rate during entire test  
 \*\* composite pumping rate during 1st pumping step

Geo. Mean Transmissivity = 56,093 gpd/ft<sup>2</sup>  
 Median Transmissivity = 61,463 gpd/ft<sup>2</sup>

**Table 2. Calculated Aquifer Transmissivity Values**

In order to subsequently map the wellhead protection area for the Village of Cazenovia supply wells, NYRWA mapped the aquifer’s potentiometric surface (Figure 3). The elevation of water levels in wells, streams, and wetlands were contoured to produce a regional map of the aquifer’s static groundwater head (Figure 3). The groundwater flow direction in the vicinity of the supply wells is approximately perpendicular to the potentiometric surface contours (towards the northwest – see arrow on Figure 3).

### 3.0 WELLHEAD PROTECTION AREA

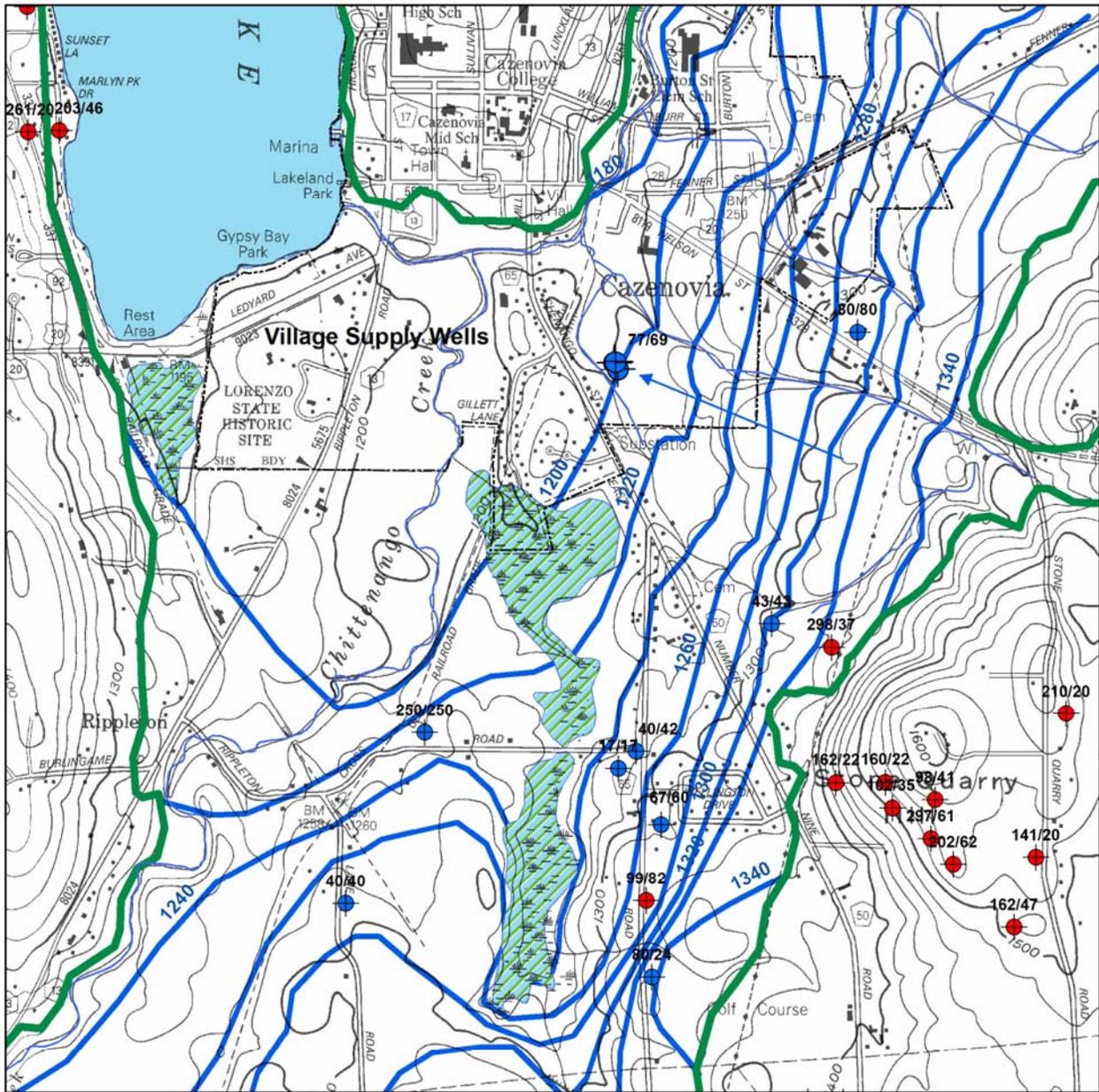
The USEPA defines a wellhead protection area as the surface and subsurface area surrounding a well through which contaminants are reasonably likely to move toward and reach the water well. Once delineated, the wellhead protection area becomes a priority area in regards to efforts to prevent or clean up groundwater contamination.

#### Zone of Contribution

The primary zone of the wellhead protection area is the *zone of contribution*. This is the portion of the sand and gravel aquifer where all recharge and ground water flows *directly* toward the pumping well(s). In a setting such as Cazenovia, where there is a pronounced regional hydraulic gradient (i.e. slope to the aquifer potentiometric surface), the zone of contribution does *not* equal the area where water levels are lowered by pumping (an area referred to as the *zone of influence*).

NYRWA determined the zone of contribution using four primary methods. The composite area using these four methods was taken to be the overall zone of contribution (see Figure 4). The first method involved subtracting the cone of depression (drawdown cone) of the production wells from the regional aquifer potentiometric surface. The cone of depression for 180 days of continuous pumping without recharge (simulating drought) was derived using the Theis equation. This surface was subtracted from the aquifer’s water table/potentiometric surface using ArcGIS Spatial Analyst. The resulting contribution area from this approach is indicated on Figure 4.

# Aquifer Potentiometric Surface Cazenovia, New York



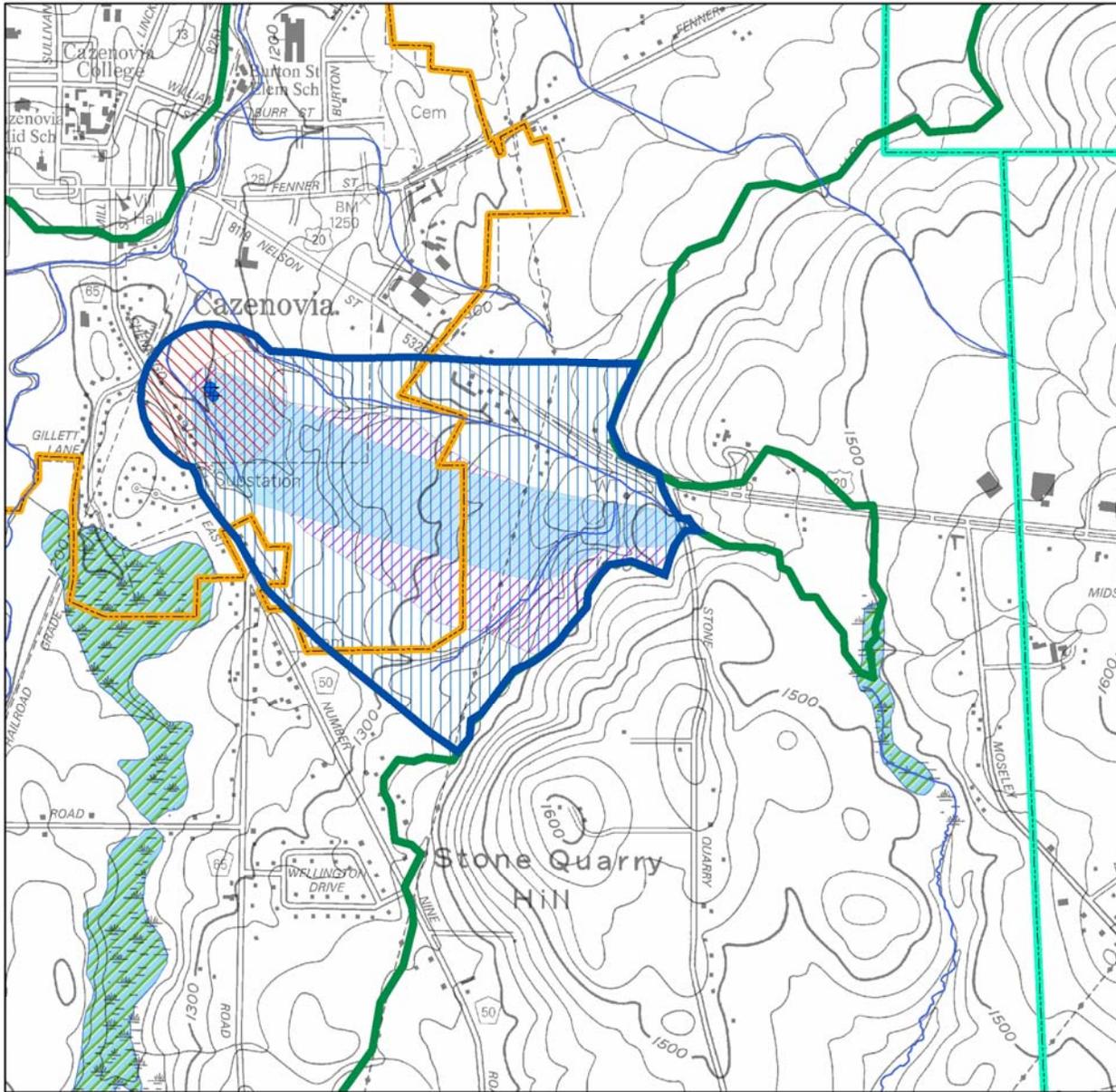
**Legend**

- Stream
- Surface Water Body
- NYSDEC Wetland
- Sand and Gravel Aquifer Boundary
- Village Supply Well
- Water Well (well depth/casing depth)
- Aquifer**
- Sand and Gravel
- Bedrock



**Figure 3. Aquifer Potentiometric Surface.**

## Zone of Contribution Delineation Cazenovia, New York



**Legend**

- ◆ Village Supply Well
- Stream
- ▨ NYSDEC Wetland
- Sand and Gravel Aquifer Boundary
- Village Boundary
- Town Boundary
- Resultant Zone of Contribution
- WHAEM Model
- Drawdown Cone on Regional Potentiometric Surface
- 60-Day Calculated Fixed Radius
- Capture Zone Calculations



Note: The Zone of Contribution is the area of the sand and gravel aquifer that directly contributes groundwater to the Village supply wells.

**Figure 4. Composite Zone of Contribution.**

The second method involved computer modeling using the USEPA's *WhAEM2000* flow model. This modeling system was specifically created to delineate wellhead protection areas. Results of *WhAEM* modeling are depicted on Figure 4. The third method involved the uniform flow equation (UFE) and hydrogeologic mapping to define the area where ground water is captured by the pumping wells. The UFE is widely used for confined aquifers and unconfined aquifers where drawdown is a small percentage of the aquifer's saturated thickness. It takes into account withdrawal rates, aquifer transmissivity, and hydraulic gradients. NYRWA applied this equation based upon design pumping rates. In order to account for temporal variations in the direction of regional groundwater flow, a range of 20 degrees on either side of the ambient regional flow direction from Figure 3 was used to encompass the overall zone of contribution. The zone of contribution derived using this method was extended to the aquifer boundary (see Figure 1). Results of the UFE are depicted on Figure 4 as "capture zone calculations".

The final method used to define the zone of contribution is based upon the Calculated Fixed Radius (CFR) method. This method uses a volumetric flow equation to calculate a fixed radius around the production wells through which water will flow at a specified travel time. This method was used to conservatively account for the potential variability of aquifer properties as well as pumping interference effects. A travel time of 60 days was chosen. This threshold is thought to be protective against potential bacterial contamination. Results of the CFR methods are indicated on Figure 4.

The composite Zone of Contribution as shown on Figure 4 covers an area of 347 acres and extends from the Village of Cazenovia into the Town of Cazenovia.

#### Watershed Zone

The final zone of the Cazenovia Wellhead Protection Area is the Watershed Zone (Figure 5). This zone comprises land areas that supply *indirect* sources of recharge to the Zone of Contribution, including non-aquifer areas that contribute surface water runoff, as well as aquifer areas contributing ground water discharge into the Zone of Contribution. The Watershed Zone comprises 327 acres and includes portions of the Village of Cazenovia, the Town of Cazenovia, and the Town of Nelson (Figure 5). It was delineated on the basis of topography and surface water runoff directions.

#### **4.0 PRESENT AND FUTURE LAND USE**

Using real property classification codes within the Wellhead Protection Area, NYRWA produced Figure 6, a map of present land use within the area. As Figure 6 indicates, a large percentage of the Wellhead Protection Area currently consists of vacant and agricultural lands. Approximately 66 percent of the Zone of Contribution consists of *likely developable area* (see Figure 7). Likely developable areas are privately-owned, undeveloped lands with no physical site constraints for development such as wet soils, wetlands, flood plains, steep slopes, etc. Overall, the Wellhead Protection Area consists of 57 percent likely developable area. At present, Town/Village zoning in the Wellhead Protection Area is residential, with minimum lot sizes of 20,000 to 30,000 square feet in the Village and 40,000 square feet in the Town.

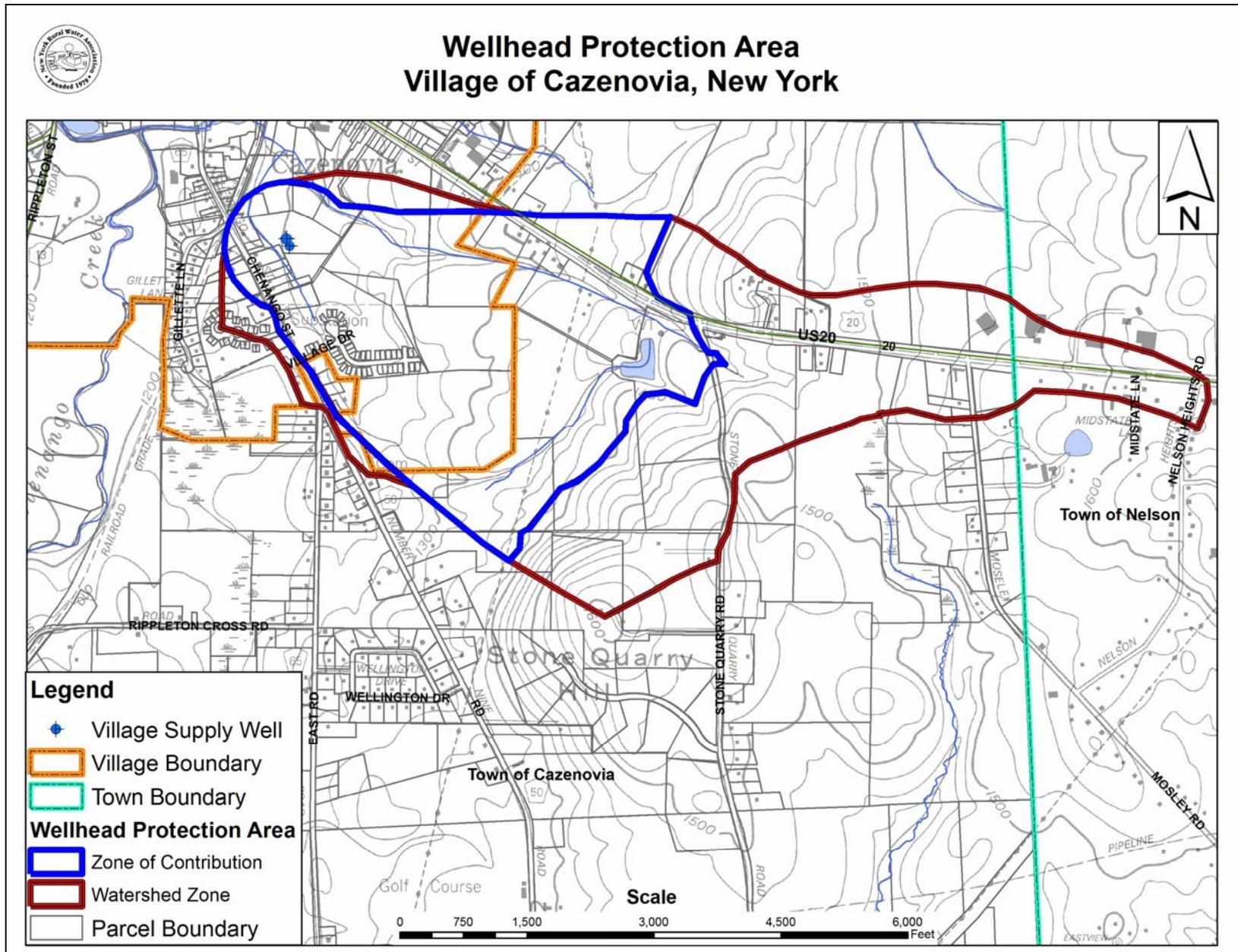


Figure 5. Wellhead Protection Area.

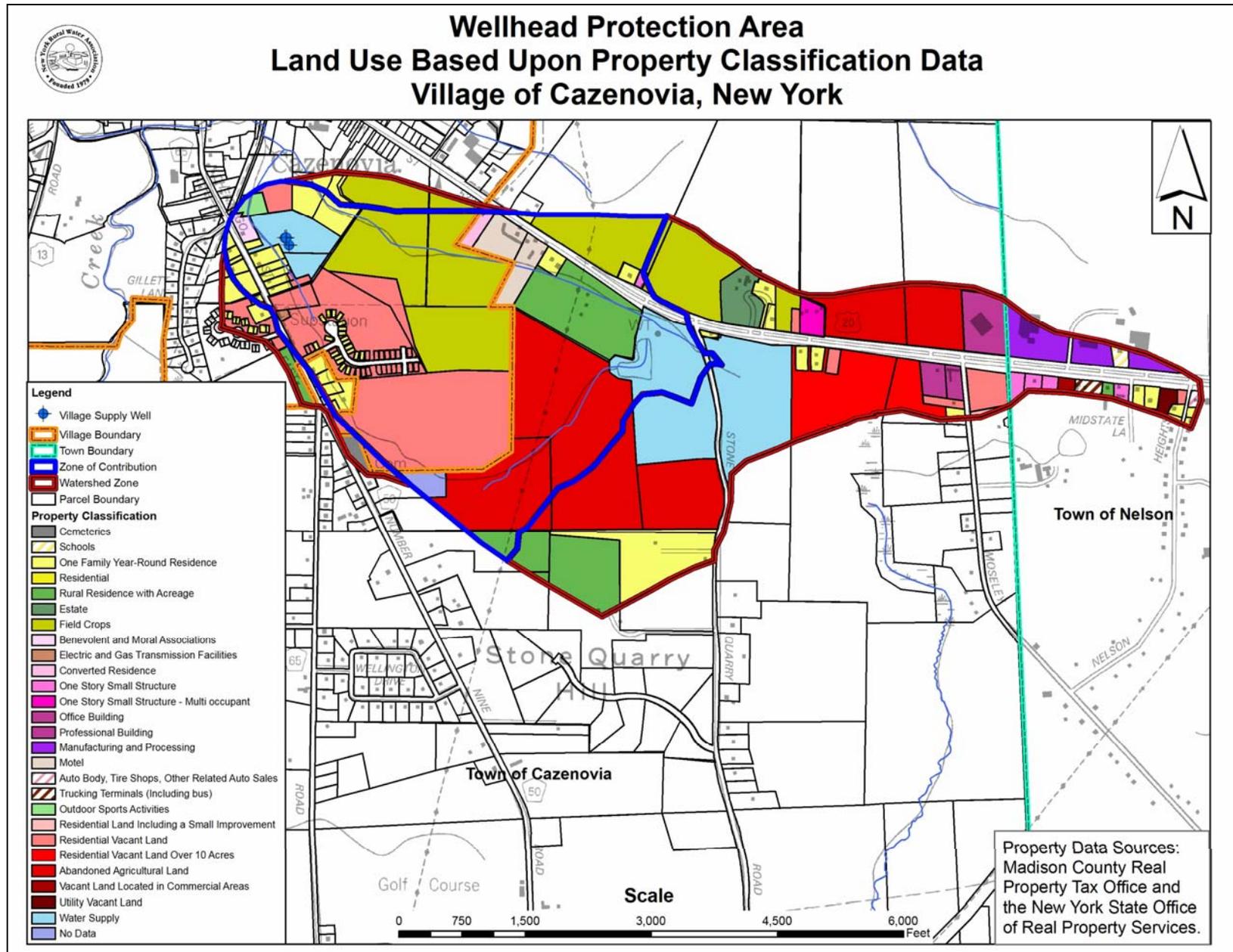


Figure 6. Land Use within the Wellhead Protection Area.

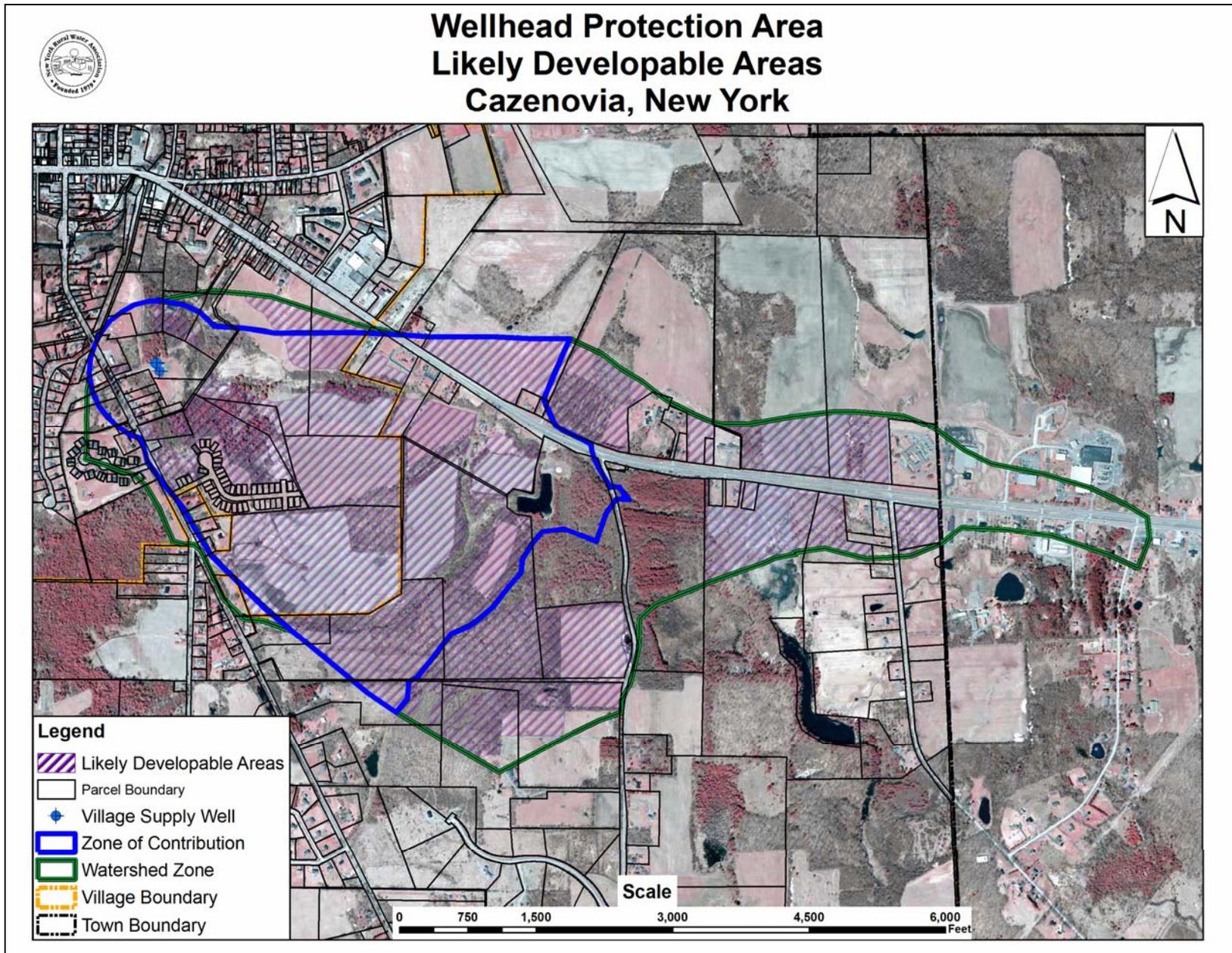


Figure 7. Likely Developable Areas in the Wellhead Protection Area.

If vacant areas become developed, the amount of impervious surfaces inevitably increases. Impervious surfaces include roofs, roads, driveways, parking lots, pools, and other surfaces that do not allow precipitation and snow melt to infiltrate into the soil and reach the water table. Impervious surfaces result in water running off the land surface, directly into wetlands, ponds, and streams. As overland flow and stormwater runoff increases, so does the magnitude and frequency of flooding. Imperviousness can significantly decrease ground water recharge. This in turn reduces the amount of ground water available to local wells, and also reduces stream baseflow (that portion of streamflow that comes from ground water and not surface runoff).

Also, as the volume of stormwater increases, pollutants picked up by the water have less time to settle out. These include nutrients such as phosphorus and nitrogen, hazardous substances and chemicals from automobiles and other sources, sediment from construction activities, and pesticides, herbicides and fertilizers. The result is that these pollutants are more likely to contaminant surface waters and ground water.

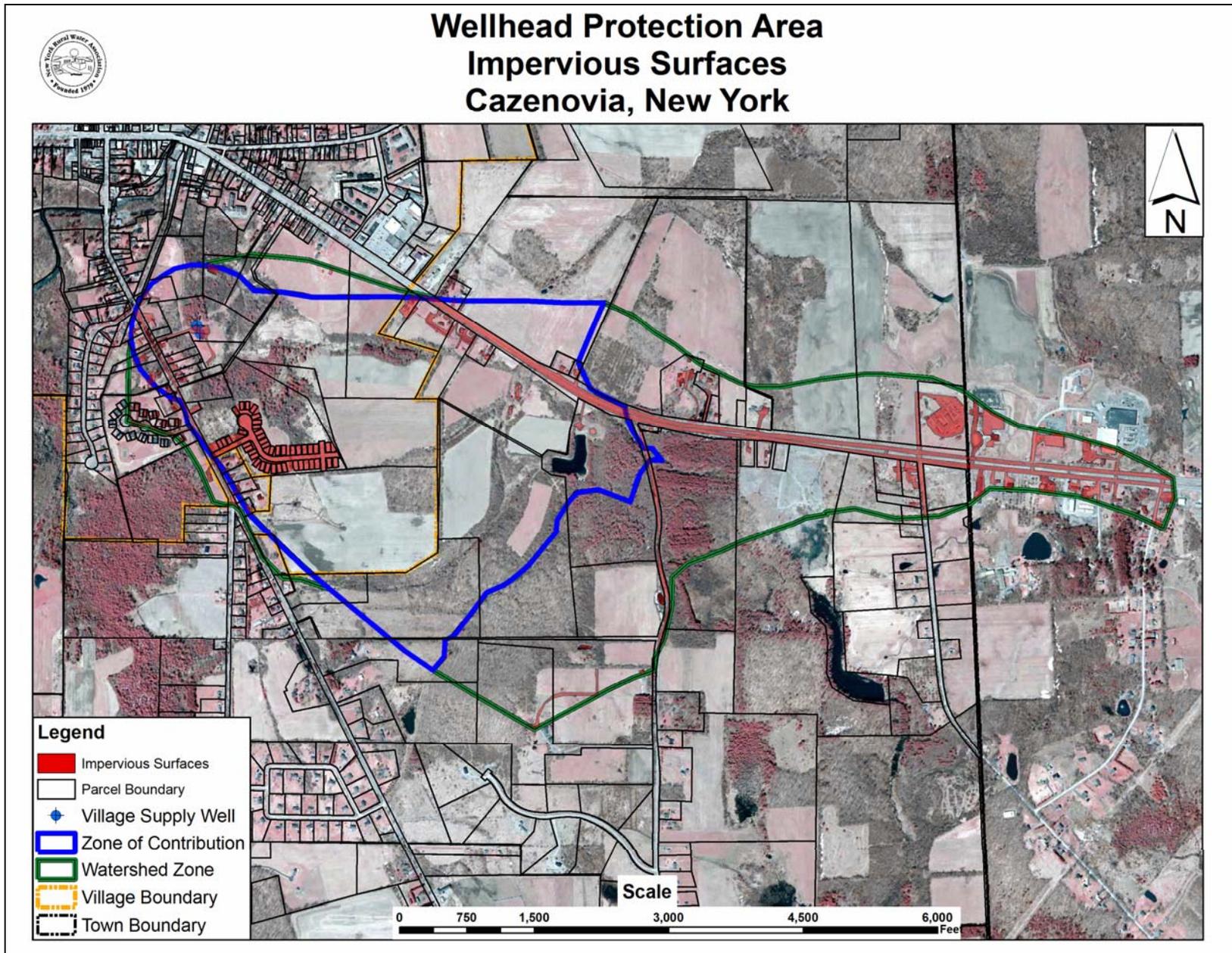
Recent research indicates that groundwater resources and streams can be considered stressed once the impervious coverage in an area exceeds a threshold of 10 to 15 percent. Using 2004 digital orthoimagery and 2007 digital tax mapping and real property data, NYRWA has mapped the current extent of impervious surfaces within the Wellhead Protection Area (see Figure 8). The extent of impervious surfaces is summarized in Table 3 below. Note that the overall impervious area percentage within the Wellhead Protection Area is currently 9.0 percent.

Zone	Total Area (acres)	Existing Impervious Area (acres)	Existing Impervious %
Zone of Contribution	346.7	24.1	7.0%
Watershed Zone	327.0	36.7	11.2%

**Table 3. Extent of Impervious Surface Area in Wellhead Protection Area.**

## **5.0 WATER SUPPLY PROTECTION STRATEGY**

In general, the land use analysis of the Cazenovia Wellhead Protection Area indicates that the critical areas supplying the water supply are not highly developed and the area should be considered protected in its *current* state of land use. However, given the large amount of vacant land and the desirable location along U.S. Route 20, future land use could change the potential susceptibility of the water supply to contamination or depletion. In order to protect the Cazenovia well supply, but also allow careful future development, NYRWA has proposed that the Village of Cazenovia and the Town of Cazenovia enact a Wellhead Protection Overlay District. Proposed local laws enacting these overlay districts are contained in Appendix A and B.



**Figure 8. Impervious Surfaces in the Wellhead Protection Area.**

The Wellhead Protection Overlay District(s) would be considered as overlaying other existing zoning districts. Any uses permitted in the underlying district(s) would be permitted in the Wellhead Protection Overlay District except where the overlay district prohibits or imposes greater or additional restrictions and requirements. For example, the overlay district would specifically prohibit certain high-risk land uses. These uses are historically associated with groundwater and/or stormwater contamination.

The proposed overlay district laws would also place limits on the percent impervious cover, specify minimum lot sizes, develop stormwater management standards, require site plan review, and establish standards for site plan review and approval within the Wellhead Protection Area. An emphasis has been placed upon minimizing impervious surfaces, maximizing on-site recharge, and avoiding risky land uses. In order to ensure a high-quality water supply, the long-term goal is to maintain the amount of impervious cover to less than 15 percent of the total Wellhead Protection Area. To do this, the permissible amount of impervious cover on new development should be capped at 10 percent, unless an enhanced and carefully-designed system of stormwater recharge to ground water is provided. Such a system would ensure that: (1) the annual volume of stormwater recharged to ground water from the developed site would approximate the annual recharge volume from pre-development site conditions; and (2) the quality of ground water or surface water leaving the site's boundaries would be similar to pre-existing conditions.

**APPENDIX A**  
**PROPOSED VILLAGE LOCAL LAW**

# VILLAGE OF CAZENOVIA

## LOCAL LAW # \_\_\_\_ OF 200\_\_

### A LOCAL LAW AMENDING CHAPTER 180 OF THE CODE OF THE VILLAGE OF CAZENOVIA TO ESTABLISH A WELLHEAD PROTECTION OVERLAY DISTRICT.

Be it enacted by the Board of Trustees of the Village of Cazenovia as follows:

**Section 1 § 180-7. of Chapter 180, Terminology, shall be amended by adding the following definitions:**

**BOTTLED WATER** - Any product, including natural spring or well water taken from municipal or private utility systems or other water, distilled water, de-ionized water or any of the foregoing to which chemicals may be added, which are put into sealed bottles, packages or other containers, to be sold for domestic consumption or culinary use, involving a likelihood of such water being ingested by human beings.

**BULK WATER** - Water intended for potable uses, which is transported by tank trucks.

**CEMETERY** – Land, place, structure, facility or building for the disposal or burial of deceased human beings, by cremation or in a grave, mausoleum, vault, columbarium, or other receptacle.

**CONCENTRATED ANIMAL FEEDING OPERATION** - An animal feeding operation that would be required to obtain a NYSDEC State Pollution Discharge Elimination System (SPDES) General Permit based upon the numbers and types of animals and/or method of animal waste discharge.

**CONTAMINATION** - The degradation of natural water quality as a result of human activities to the extent that its usefulness is impaired.

**CREMATORY** - A facility or portion of a building in which the remains of deceased human beings are processed by cremation.

**DEICING COMPOUNDS** - Any bulk quantities of chloride compounds and/or other deicing compounds (e.g., urea or calcium magnesium acetate) intended for application to roads, including mixtures of sand and chloride compounds in any proportion where the chloride compounds constitute over eight percent of the mixture. Bulk quantity of deicing compounds means any quantity, but does not include any chloride compounds in a solid form which are packaged in waterproof bags or containers which do not exceed one hundred pounds each.

**DISPOSAL** - The abandonment, discharge, deposit, injection, dumping, spilling, leaking, or placing by any other means of any solid waste, petroleum, radioactive material, hazardous substance, hazardous waste, or aqueous carried waste into or onto land or a surface water body.

**FERTILIZERS** - Any commercially produced mixture generally containing phosphorous, nitrogen, and/or potassium which is applied to the ground to increase nutrients from plants.

**FLEET** - A group of motor vehicles owned or operated as a unit or a group of motor vehicles operating together under the same ownership.

**FUEL OIL** - All oil which has been refined, re-refined, or otherwise processed for the purpose of being burned to produce heat.

**GROUND WATER** - Water below the land surface in a saturated zone of soil or rock. This includes perched water separated from the main body of groundwater by an unsaturated zone.

**HAZARDOUS SUBSTANCE** - Any substance listed as a hazardous substance in 6 NYCRR Part 597, Hazardous Substance List, or a mixture thereof. In general, a hazardous substance means any substance which: (1) because of its quantity, concentration, or physical, chemical, or infectious characteristics poses a significant hazard to human health or safety if improperly treated, stored, transported, disposed of, or otherwise managed; (2) poses a present or potential hazard to the environment when improperly treated, stored, transported, disposed of, or otherwise managed; (3) because of its toxicity or concentration within biological chains, presents a demonstrated threat to biological life cycles when released into the environment.

**HAZARDOUS WASTE** - A waste, or combination of wastes, which are identified or listed as hazardous pursuant to 6 NYCRR Part 371, Identification and Listing of Hazardous Wastes. Hazardous wastes include but are not limited to petroleum products, organic chemical solvents, heavy metal sludges, acids with a pH less than or equal to 2.0, alkalies with a pH greater than or equal to 12.5, radioactive substances, pathological or infectious wastes, or any material exhibiting the characteristics of ignitability, corrosivity, reactivity, or fails the Toxicity Characteristic Leaching Procedure (TCLP).

**IMPERVIOUS SURFACE** - Any material placed on or above the earth that substantially reduces or prevents the natural percolation of precipitation and melted snow into the soil. Examples include but are not limited to structures, including eaves, roofs and roof overhangs; parking areas (whether hard-surfaced or not); driveways; sidewalks; patios and decks; sport courts; and pools. The following shall not be considered as impervious surface: (1) wood decks less than 200 square feet if constructed with a space between each plank and if the deck is constructed over a pervious surface (one-half of the area of such wood decks exceeding 200 square feet shall be considered impervious surface); (2) pathways 6 feet or less in width that employ grass pavers or porous paving and which are not intended for automobile use.

**MANURE** - Shall mean animal feces and urine.

**MARINA** - Any installation which provides any accommodations or facilities for watercraft, including mooring, docking, storing, leasing, sale, or servicing.

**NURSERY** - The grounds and premises, private or public, on or in which trees, shrubs, plants, vines, and parts thereof are propagated, grown, or cultivated for the purpose of distribution or selling the same as a business.

**PARENT PARCEL** - Any lot of record existing on \_\_\_\_\_ which has subsequently been subdivided into one or more additional lots of record.

**PET CEMETERY** - Land, place, structure, facility or building provided by any person to veterinarians or members of the general public for use, or reservation for use, for the permanent interment or inurnment above or below ground of pet remains.

**PET CREMATORIUM** - Any land, place, structure, facility or building provided by any person to veterinarians or members of the general public for the cremation of pets.

**PETROLEUM** - Any petroleum-based oil of any kind which is liquid at 20 degrees Celsius under atmospheric pressure and has been refined, re-refined, or otherwise processed for the purpose of: 1)

being burned to produce heat or energy; 2) as a motor fuel or lubricant; or 3) in the operation of hydraulic equipment.

**PROCESS WASTE** - Any waste generated by industrial, commercial, or mining operations that by virtue of some use, process, or procedure no longer meets the manufacturer's original product specifications.

**RADIOACTIVE MATERIAL** - Any material in any form that emits radiation spontaneously, excluding those radioactive materials or devices containing radioactive materials which are exempt from licensing and regulatory control pursuant to regulations of the New York State Department of Labor or the United States Nuclear Regulatory Commission.

**SEPTAGE** - The contents of a septic tank, cesspool, or other individual wastewater treatment work which receives domestic sewage wastes.

**SEWAGE** - The combination of human and household waste with water which is discharged to the home plumbing system.

**SOLID WASTE** - Material as defined in 6 NYCRR Part 360, including any garbage, refuse, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility and other discarded materials including solid, liquid, semi-solid, or contained gaseous material, resulting from industrial, commercial, mining and agricultural operations, and from community activities, but not including solid or dissolved materials in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges that are point sources subject to permit. Discarded materials that are being beneficially used pursuant to 6 NYCRR Part 360-1.15 are not considered solid waste.

**SLUDGE** - The solid, semi-solid, or liquid waste generated from a waste processing facility, but does not include the liquid stream of effluent.

**TRIP GENERATION RATE** - The number of vehicle trips that begin or end at a land use during a given period.

**WASTEWATER** - Aqueous carried waste including, but not limited to, dredge spoil, solid waste, hazardous waste, incinerator ash and residue, sewage, septage, garbage, refuse, sludge, chemical waste, infectious waste, biological material, radioactive materials, heat, and commercial, industrial, municipal, and agricultural waste.

**WATERSHED ZONE** –The land areas that supply indirect sources of recharge to the Zone of Contribution, including non-aquifer areas that contributes surface water runoff, as well as aquifer areas contributing ground water discharge into the Zone of Contribution.

**ZONE OF CONTRIBUTION** – The land area overlying that portion of the local sand and gravel aquifer where all recharge and ground water directly flows toward the pumping well(s).

**Section 2 § 180-8. Enumeration of districts, shall be amended by adding the following:**

- A. Wellhead Protection Overlay District. Lots and portions of lots within the boundaries of the Wellhead Protection Overlay District are subject to the regulations of both the zoning district and the overlay district as provided herein.

**Section 3 § 180-9. Zoning Map shall be amended to read as follows:**

**§ 180-9. Zoning Map.**

The location and boundaries of each zoning district, hereafter referred to as district, ~~and the Historic Preservation Overlay District, and the Wellhead Protection Overlay District~~ are shown on the map entitled "Village of Cazenovia Zoning Map," enacted and adopted as part of these regulations and hereafter referred to as Zoning Map. The Zoning Map shall be on file in the office of the Village Clerk. These regulations shall not become effective until the Zoning Map has been placed on file. Any amendment of these regulations requiring a change in the Zoning Map shall not become effective until the change has been made on the filed map.

**Section 4 Chapter 180, Zoning, shall be amended by addition of the following Article:**

**ARTICLE XV Wellhead Protection Overlay District**

**§ 180-120. Purpose.**

A wellhead protection overlay district is established In order to assist in the preservation of public health, general welfare, and safety of the residents of the Village through the elimination or prevention of groundwater contamination in the vicinity of wells that supply public drinking water.

**§ 180-121. Boundaries of the wellhead protection overlay district.**

The Wellhead Protection Overlay District includes the land area through which contaminants are reasonably likely to move toward and reach the water wells operated by the Village of Cazenovia. This area, termed the wellhead protection area, was delineated in the 2007 document entitled "*Wellhead Protection Plan for the Village of Cazenovia Water Supply*" prepared by the New York Rural Water Association. The Wellhead Protection Overlay District consists of the portions of the Zone of Contribution and the Watershed Zone located within the Village. These two different zones are delineated in the "*Wellhead Protection Plan for the Village of Cazenovia Water Supply*" that is on file with the Village Clerk.

**§ 180-122. Applicability of regulations.**

The Wellhead Protection Overlay District shall be considered as overlaying other existing districts as shown on the zoning map. Any uses permitted in the underlying district shall be permitted in the Wellhead Protection Overlay District except where the overlay district prohibits or imposes greater or additional restrictions and requirements. In any cases where conflicts arise between these requirements and any other existing regulations, the more restrictive regulations shall apply.

**§180-123. Prohibited uses and activities.**

Uses and activities prohibited in the Wellhead Protection Overlay District include the following:

- A. Airports, flying fields, airport terminals, and/or airport maintenance areas.
- B. Bottled water or bulk water facility, including supply source(s), pumping stations(s), etc.
- C. Car or vehicle washing facility.
- D. Cemetery or crematory.
- E. Commercial nursery or garden center.
- F. Concentrated animal feeding operation.

- G. Convenience store associated with a gasoline service station.
- H. Establishments for the cleaning and servicing of catch basins, cesspools, septic tanks, sewers, tanks and boilers, or tank trucks.
- I. Facility with exterior storage or loading/unloading of hazardous substances.
- J. Fleet storage area (car, bus, truck, etc.), including a motor freight transportation or motor vehicle passenger terminal.
- K. Fuel oil dealer, or petroleum and petroleum products wholesaler, or wholesale distributor of crude petroleum and petroleum products.
- L. Gasoline service station.
- M. Golf course.
- N. High intensity use parking lot(s) defined as having average vehicle trip generation rates of 1,000 or greater per day. Typical use examples generating such rates include but are not limited to: fast-food restaurants, convenience stores, discount stores, discount clubs, lumber/home improvement stores, shopping centers, supermarkets, etc. In addition, some uses such as high-turnover (sit-down) restaurants, drugstores, drive-through banks, day care centers, schools, hotels/motels, park & ride lots, post offices, medical offices/clinics, hospitals, libraries, and other institutions may generate average vehicle trip generation rates of 1,000 or greater per day depending upon their size.
- O. Industrial or manufacturing facility subject to the NYSDEC State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges or the USEPA National Pollution Discharge Elimination System (NPDES) stormwater permit program.
- P. Laundry, cleaning, or garment services, including drycleaners, coin-operated laundries, commercial or industrial laundries, carpet and upholstery cleaners, and linen supply services.
- Q. Junkyard or vehicle salvage/recycling facility.
- R. Maintenance and repair shops for major or small household appliances and electrical entertainment devices (stoves, washers, televisions, DVD players, etc.) or low-power internal combustion engines or electric motors (chain saws, lawn mowers, snowmobiles, etc.).
- S. Marina or boat service/maintenance facility.
- T. Motor freight transportation (e.g. trucking) or motor vehicle passenger (e.g. bus) terminals.
- U. Motor vehicle service or commercial garage.
- V. Municipal facility involving public works storage except for the storage of equipment and supplies necessary for the safe provision of public drinking water.
- W. Municipal or industrial sewage treatment facility with disposal of primary or secondary effluent.
- X. Pest control services or establishments engaged in the wholesale distribution of pesticides or herbicides.
- Y. Pet cemetery or pet crematory.

- Z. Pipelines that carry petroleum (other than natural gas) or hazardous substance/waste.
- AA. Quarry.
- BB. Stockpiling or storage of coal, deicing compounds, fertilizers, or other bulk chemicals except in structures designed to prevent contact with precipitation and constructed on low permeability pads.
- CC. Storage of manure, except for the primary purpose of agricultural use.
- DD. Surface land application of septage, sewage, sludge, or human excreta.
- EE. Wells or any other facility for oil, gas, gas storage, solution mining, brine disposal, or geothermal resources.
- FF. Any use or activity that involves the on-site disposal of solid waste, pathological or medical waste, petroleum, radioactive material, hazardous substances, hazardous waste, or process wastes, including aqueous-carried waste.

**§ 180-123. Impervious Coverage and Lot Size**

A. Maximum Impervious Coverage.

- (1) Except as hereinafter provided, within the Wellhead Protection Overlay District, no more than ten percent (10%) or three- thousand (3,000) square feet of a single parent parcel or building site, whichever is greater, may be rendered impervious to infiltration. Maximum site impervious coverage calculations shall include all impervious surfaces with a minimum area of over one hundred (100) square feet.
- (2) Impervious coverage may only exceed ten percent (10%) or three-thousand (3,000) square feet of a single parent parcel or building site (whichever is greater) if a system of stormwater management and treatment is developed that results in the site's post-development annual stormwater recharge volume to ground water approximating the site's pre-development annual groundwater recharge volume. Such a system should also: preserve hydrologic conditions that closely resemble pre-development conditions, maintain or replicate the predevelopment hydrologic functions of storage, infiltration, and groundwater recharge; prevent untreated discharges; reduce or prevent flooding by managing the peak discharges and volumes of runoff; minimize erosion and sedimentation; prevent degradation of water by reducing suspended solids and other pollutants; and provide increased protection of sensitive natural resources.

B. Minimum Lot Size.

- (1) In the Wellhead Protection Overlay District, the minimum size for lots served by private sewage disposal systems (i.e. septic systems) shall be eighty-thousand (80,000) square feet.
- (2) In areas serviced by public sanitary sewer, the minimum size for lots in the Wellhead Protection District shall be that for the underlying zoning district.

**§ 180-124. Stormwater Management Standards.**

A. Stormwater Pollution Prevention Plan.

- (1) A Stormwater Pollution Prevention Plan (SWPPP) must be submitted to the Planning Board for any proposed use that is required to submit a site plan for review within the Wellhead Protection Overlay District (see § 180-125.). This plan will detail the site's stormwater management and treatment system, including the design and operational details that will: (1) reduce or eliminate erosion and sediment loading to water bodies during construction; (2) control the impact of stormwater runoff on the water quality of the receiving waters; (3) control the increased volume and peak rate of runoff during and after construction; and (4) maintain stormwater controls during and after completion of construction.
  - (2) The SWPPP must meet applicable stormwater quality/quantity sizing criteria as well as performance criteria that are outlined in the latest version of the New York State Stormwater Management Design Manual. The SWPP should also contain sufficient information for the Village to evaluate the plan with respect to additional post-development stormwater management criteria (see below). It must be prepared and certified by a New York State licensed professional engineer or landscape architect, or a Certified Professional in Erosion and Sediment Control (CPESC).
- B. Additional Post-Development Stormwater Management Criteria for the Wellhead Protection Overlay District
- (1) In addition to the quality/quantity sizing and performance criteria identified in the New York State Stormwater Management Design Manual, all projects in the Wellhead Protection Overlay District that are required to submit a Stormwater Pollution Prevention Plan (i.e. all projects that must submit a site plan within the Wellhead Protection Overlay District – see § 180-125) shall achieve the following performance standards:
    - (a) Groundwater Recharge. The annual recharge from the post-development site should reasonably approximate the annual recharge from the pre-development (existing) site conditions based upon soil types.
    - (b) Recharge Volume. The prescribed design volume of stormwater to be recharged on the site (the so-called Groundwater Recharge Volume,  $Re_v$ ) shall be determined by the method that is contained in Appendix C of the 2007 document entitled "*Wellhead Protection Plan for the Village of Cazenovia Water Supply*" prepared by the New York Rural Water Association. A copy of this document is filed with the Village Clerk. Different recharge values for soils may be used provided that on-site soil evaluations have been conducted and a professional geologist clearly demonstrates that the recharge rate differs from the listed values based upon soils, precipitation, and evapotranspiration.
    - (c) Hydrologic Conditions – The hydrologic conditions of the developed site must closely resemble pre-development conditions through adequate use of design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source.
    - (d) Sensitive Areas. Stormwater discharges to ground water shall not occur within a distance of 800 feet of any public water supply well operated by the Village of Cazenovia.
    - (e) Pretreatment. Stormwater runoff shall be directed to pretreatment device(s) such as water quality inlets, sediment traps, drainage channels, water quality swales, etc. to help trap coarse materials before they enter the primary stormwater management and treatment practice(s).
    - (f) Emergency Design Measures. Stormwater management and treatment systems should incorporate designs which allow for shut-down and containment in the event of an emergency spill or other unexpected contamination event.

- (g) Operation and Maintenance Plan. All stormwater management and treatment system must have an operation and maintenance plan to ensure that system(s) function as designed. Such a plan should include details on how post-construction inspection and long-term maintenance is to be carried out.
- (h) Performance Bond. In order to ensure that funds are available to finish the construction and ensure the proper functioning of stormwater management and treatment system(s), the Village shall require the developer or contractor to provide, prior to construction, a performance bond, escrow account certification, or irrevocable letter of credit from an appropriate financial or surety institution which guarantees satisfactory completion of the project and names the Village as the beneficiary. The security shall be in an amount to be determined by the Planning Board and Village Board based on submission of final design plans in the Stormwater Pollution Prevention Plan, and an evaluation of projected construction costs by the Village Engineer.
- (i) Maintenance Bond. Where stormwater management and treatment system(s) are to be operated and maintained by the developer or by a corporation that owns or manages a commercial or industrial facility, the developer, prior to final approval of construction, shall be required to provide the Village with a maintenance bond, escrow account certification, or irrevocable letter of credit from an appropriate financial or surety institution to ensure proper operation and maintenance of all stormwater management and treatment system(s) for a twenty year period. The estimated maintenance cost for the facilities shall be based on a reasonable estimate provided by the Village Engineer and adopted by the Village Board. The Maintenance Bond shall guarantee the stormwater facilities against design defects and/or failures in workmanship, and shall guarantee that the facilities constructed under the permit will be regularly and adequately maintained throughout the maintenance period. If the developer or owner fails to properly operate and maintain the stormwater management and treatment system(s), the Village may draw upon the account to cover the costs of proper operation and maintenance.

#### **§ 180-125. Site Plan Review Requirements**

##### **A. Uses requiring site plan review within the Wellhead Protection Overlay District.**

- (1) In addition to the uses and activities requiring site plan review as indicated in § 180-23., the Planning Board shall have site plan review and approval on any proposed use or activity requiring a building permit located partially or wholly within the Wellhead Protection Overlay District that meets one or more of the following conditions:
  - (a) The proposed use or activity would render impervious to infiltration ten percent (10%) or three-thousand (3,000) square feet of a single parent parcel or building site, whichever is greater.
  - (b) The proposed use or activity is not served by public sanitary sewer and will generate more than a daily average of 1,000 gallons of wastewater.
  - (c) The proposed use or activity will extract more than 1,000 gallons per day of ground water.

##### **B. Site plan submittal requirements within the Wellhead Protection Overlay District.**

- (1) In addition to other information that may be required for a site plan submittal as indicated in § 180-119. and elsewhere in the Village Code, the following information shall be provided for a proposed use or activity located partially or wholly within the Wellhead Protection Overlay District that requires site plan review and approval:

- (a) Location of the proposed use or activity in relation to the Wellhead Protection Overlay District boundaries.
- (b) Location and extent of existing (pre-development) and post-development impervious surfaces.
- (c) Details regarding the proposed conveyance, storage, distribution, generation, handling, use, and/or treatment of any sewage, process wastes, aqueous-carried wastes, petroleum, hazardous substances, hazardous waste, solid waste, radioactive material, and/or incidental wastes. Include the estimated types and quantities of such materials to be located on-site.
- (d) A Stormwater Pollution Prevention Plan (SWPPP) prepared in accordance with § 180-123.
- (e) A description of all pollution control measures and activities proposed to prevent on-site disposal and potential contamination of ground water or surface water, including spill response activities.
- (f) A statement as to the degree of threat to groundwater and surface water quality that could result if the control measures failed.
- (g) A description of the provisions for the off-site disposal of any solid waste, petroleum, radioactive material, hazardous substances, hazardous waste, process wastes, and/or aqueous-carried waste (except sewage).
- (h) If an on-site water supply is to be utilized, provide a description of the proposed means of water supply, including if applicable an estimate of the total daily groundwater withdrawal rate.
- (i) Other information as necessary to fully explain the project and evaluate its potential impact upon the Village of Cazenovia's public water supply.

C. Site plan review criteria and procedures.

- (1) In addition to other site plan review criteria and procedures as indicated in § 180-23. and elsewhere in Village Code, the Planning Board shall also review all site plans located partially or wholly within the Wellhead Protection Overlay District as appropriate in terms of the following criteria:
  - (a) Adequacy of the Stormwater Pollution Prevention Plan in meeting criteria established in the New York Stormwater Management Design Manual as well as additional post-development stormwater management criteria identified in § 180-123.
  - (b) Adequacy of proposed control measures to prevent the on-site disposal of solid waste, pathological or medical waste, petroleum, radioactive material, hazardous substances, hazardous waste, or process waste, including aqueous-carried waste.
  - (c) Adequacy of the provisions for off-site disposal of solid waste, hazardous waste, process waste, and other wastes generated.
  - (d) The degree of threat to public water supply wells in the event that contamination control measures or devices at the site should fail.

- (e) Adequacy of spill response and containment plans to minimize groundwater or surface water contamination.
- (f) Adequacy of plans and resources to properly construct and regularly maintain contamination control devices.

D. Planning Board findings.

- (1) In addition to other considerations as specified in § 180-23. and elsewhere in Village Code, in order to approve a site plan for purposes of authorizing a building permit in the Wellhead Protection Overlay District, the Planning Board shall make the following findings:
  - (a) The proposed use and site plan comply with all regulations applicable to the Wellhead Protection Overlay District.
  - (b) The proposed use and site plan will not adversely impact the predevelopment hydrologic functions of the site, including the pre-existing volume of annual groundwater recharged at the site, the quantity and direction of pre-existing drainage eventually draining to the Zone of Contribution, etc.
  - (c) The proposed use will not adversely impact upon the pre-existing quality of ground water or surface water leaving the site's boundaries.
  - (d) The proposed use is to be located, developed, and maintained in such a manner as to not adversely impact the long-term quantity or quality of ground water available to public water supply wells operated by the Village of Cazenovia.

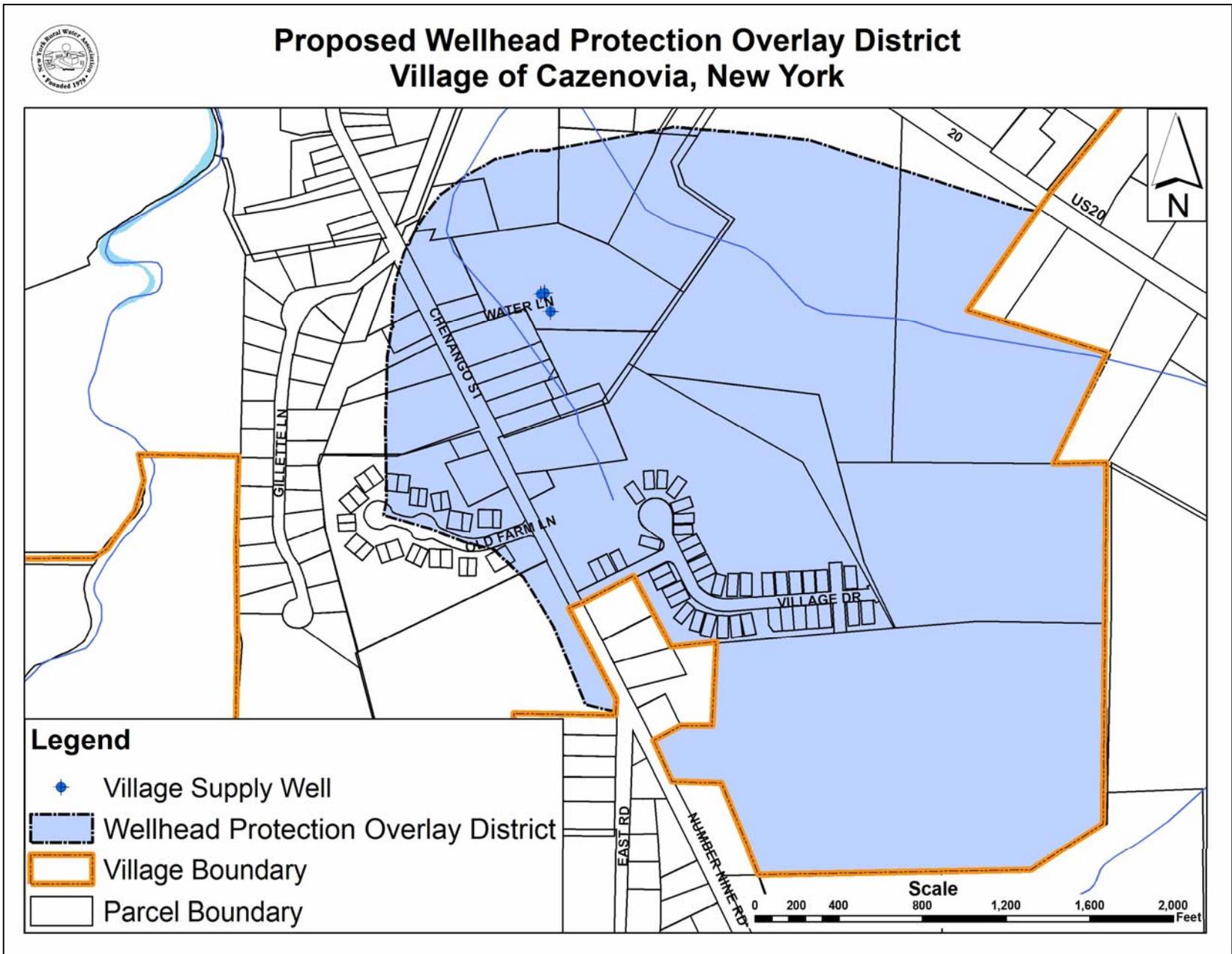
## **Section 5    Validity**

If any section or provision of this Local Law shall be adjudicated invalid for any reason, the same shall not affect the validity of the remainder of this Local Law.

All ordinances and Local Laws and parts thereof heretofore enacted by the Village are hereby declared to be superseded to the extent to which such ordinance or Local Law is inconsistent or in conflict with this Local Law.

## **Section 6    Effective Date**

This Local Law shall take effect upon its filing with the Secretary of State.



**APPENDIX B**  
**PROPOSED TOWN LOCAL LAW**

# TOWN OF CAZENOVIA

## LOCAL LAW # \_\_\_\_ OF 200\_\_

### A LOCAL LAW AMENDING CHAPTER 165 OF THE CODE OF THE TOWN OF CAZENOVIA TO ESTABLISH A WELLHEAD PROTECTION OVERLAY DISTRICT.

Be it enacted by the Town Board of the Town of Cazenovia as follows:

**Section 1    § 165-4. of Chapter 165, Definitions, shall be amended by adding the following terms:**

**BOTTLED WATER** - Any product, including natural spring or well water taken from municipal or private utility systems or other water, distilled water, de-ionized water or any of the foregoing to which chemicals may be added, which are put into sealed bottles, packages or other containers, to be sold for domestic consumption or culinary use, involving a likelihood of such water being ingested by human beings.

**BULK WATER** - Water intended for potable uses, which is transported by tank trucks.

**CEMETERY** – Land, place, structure, facility or building for the disposal or burial of deceased human beings, by cremation or in a grave, mausoleum, vault, columbarium, or other receptacle.

**CONCENTRATED ANIMAL FEEDING OPERATION** - An animal feeding operation that would be required to obtain a NYSDEC State Pollution Discharge Elimination System (SPDES) General Permit based upon the numbers and types of animals and/or method of animal waste discharge.

**CONVENIENCE STORE** — A retail store generally providing a limited range of packaged food, beverage, and other consumable household merchandise often associated with another principal use such as a gasoline service station.

**CONTAMINATION** - The degradation of natural water quality as a result of human activities to the extent that its usefulness is impaired.

**CREMATORY** - A facility or portion of a building in which the remains of deceased human beings are processed by cremation.

**DEICING COMPOUNDS** - Any bulk quantities of chloride compounds and/or other deicing compounds (e.g., urea or calcium magnesium acetate) intended for application to roads, including mixtures of sand and chloride compounds in any proportion where the chloride compounds constitute over eight percent of the mixture. Bulk quantity of deicing compounds means any quantity, but does not include any chloride compounds in a solid form which are packaged in waterproof bags or containers which do not exceed one hundred pounds each.

**DISPOSAL** - The abandonment, discharge, deposit, injection, dumping, spilling, leaking, or placing by any other means of any solid waste, petroleum, radioactive material, hazardous substance, hazardous waste, or aqueous carried waste into or onto land or a surface water body.

**FERTILIZERS** - Any commercially produced mixture generally containing phosphorous, nitrogen, and/or potassium which is applied to the ground to increase nutrients from plants.

**FLEET** - A group of motor vehicles owned or operated as a unit or a group of motor vehicles operating together under the same ownership.

**FUEL OIL** - All oil which has been refined, re-refined, or otherwise processed for the purpose of being burned to produce heat.

**GROUND WATER** - Water below the land surface in a saturated zone of soil or rock. This includes perched water separated from the main body of groundwater by an unsaturated zone.

**HAZARDOUS SUBSTANCE** - Any substance listed as a hazardous substance in 6 NYCRR Part 597, Hazardous Substance List, or a mixture thereof. In general, a hazardous substance means any substance which: (1) because of its quantity, concentration, or physical, chemical, or infectious characteristics poses a significant hazard to human health or safety if improperly treated, stored, transported, disposed of, or otherwise managed; (2) poses a present or potential hazard to the environment when improperly treated, stored, transported, disposed of, or otherwise managed; (3) because of its toxicity or concentration within biological chains, presents a demonstrated threat to biological life cycles when released into the environment.

**HAZARDOUS WASTE** - A waste, or combination of wastes, which are identified or listed as hazardous pursuant to 6 NYCRR Part 371, Identification and Listing of Hazardous Wastes. Hazardous wastes include but are not limited to petroleum products, organic chemical solvents, heavy metal sludges, acids with a pH less than or equal to 2.0, alkalies with a pH greater than or equal to 12.5, radioactive substances, pathological or infectious wastes, or any material exhibiting the characteristics of ignitability, corrosivity, reactivity, or fails the Toxicity Characteristic Leaching Procedure (TCLP).

**IMPERVIOUS SURFACE** - Any material placed on or above the earth that substantially reduces or prevents the natural percolation of precipitation and melted snow into the soil. Examples include but are not limited to structures, including eaves, roofs and roof overhangs; parking areas (whether hard-surfaced or not); driveways; sidewalks; patios and decks; sport courts; and pools. The following shall not be considered as impervious surface: (1) wood decks less than 200 square feet if constructed with a space between each plank and if the deck is constructed over a pervious surface (one-half of the area of such wood decks exceeding 200 square feet shall be considered impervious surface); (2) pathways 6 feet or less in width that employ grass pavers or porous paving and which are not intended for automobile use.

**MANURE** - Shall mean animal feces and urine.

**MARINA** - Any installation which provides any accommodations or facilities for watercraft, including mooring, docking, storing, leasing, sale, or servicing.

**MUNICIPAL FACILITY** — Any Town of Cazenovia or Village of Cazenovia building or other facility used for governmental purposes, and any fire station.

**NURSERY** –The grounds and premises, private or public, on or in which nursery stock is propagated, grown or cultivated for the purpose of distribution or selling the same as a business.

**PARENT PARCEL** - Any lot of record existing on \_\_\_\_\_ which has subsequently been subdivided into one or more additional lots of record.

**PET CEMETERY** - Land, place, structure, facility or building provided by any person for a fee, whether or not for profit, to veterinarians or members of the general public for use, or reservation for use, for the permanent interment or inurnment above or below ground of pet remains.

**PET CREMATORIUM** - Any land, place, structure, facility or building provided by any person for a fee, whether or not for profit, to veterinarians or members of the general public for the cremation of pets.

**PETROLEUM** - Any petroleum-based oil of any kind which is liquid at 20 degrees Celsius under atmospheric pressure and has been refined, re-refined, or otherwise processed for the purpose of: 1) being burned to produce heat or energy; 2) as a motor fuel or lubricant; or 3) in the operation of hydraulic equipment.

**PROCESS WASTE** - Any waste generated by industrial, commercial, or mining operations that by virtue of some use, process, or procedure no longer meets the manufacturer's original product specifications.

**QUARRY** — Commercial excavation and extraction of soil, sand, stone, gravel, minerals, or other natural materials and substances from land.

**RADIOACTIVE MATERIAL** - Any material in any form that emits radiation spontaneously, excluding those radioactive materials or devices containing radioactive materials which are exempt from licensing and regulatory control pursuant to regulations of the New York State Department of Labor or the United States Nuclear Regulatory Commission.

**SEPTAGE** - The contents of a septic tank, cesspool, or other individual wastewater treatment work which receives domestic sewage wastes.

**SEWAGE** - The combination of human and household waste with water which is discharged to the home plumbing system.

**SOLID WASTE** - Material as defined in 6 NYCRR Part 360, including any garbage, refuse, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility and other discarded materials including solid, liquid, semi-solid, or contained gaseous material, resulting from industrial, commercial, mining and agricultural operations, and from community activities, but not including solid or dissolved materials in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges that are point sources subject to permit. Discarded materials that are being beneficially used pursuant to 6 NYCRR Part 360-1.15 are not considered solid waste.

**SLUDGE** - The solid, semi-solid, or liquid waste generated from a waste processing facility, but does not include the liquid stream of effluent.

**TRIP GENERATION RATE** - The number of vehicle trips that begin or end at a land use during a given period.

**WASTEWATER** - Aqueous carried waste including, but not limited to, dredge spoil, solid waste, hazardous waste, incinerator ash and residue, sewage, septage, garbage, refuse, sludge, chemical waste, infectious waste, biological material, radioactive materials, heat, and commercial, industrial, municipal, and agricultural waste.

**WATERSHED ZONE** —The land areas that supply indirect sources of recharge to the Zone of Contribution, including non-aquifer areas that contributes surface water runoff, as well as aquifer areas contributing ground water discharge into the Zone of Contribution.

ZONE OF CONTRIBUTION – The land area overlying that portion of the local sand and gravel aquifer where all recharge and ground water directly flows toward the pumping well(s).

**Section 2 § 165-5. Establishment, shall be amended by adding the following:**

- A. Wellhead Protection Overlay District.

**Section 3 § 165-6. Zoning Map shall be amended to read as follows:**

**§ 165-6. District boundaries; Zoning Map.**

The boundaries of said districts are fixed and defined as shown on an index map titled the "Zoning Map of the Town of Cazenovia, 1964, as amended ~~October 14, 1994.~~\_\_\_\_\_ " Said map, together with all the explanatory matter contained thereon, is hereby made a part of this chapter and shall be duly certified as such by the Town Clerk and filed according to law.

**Section 4 Chapter 165, Zoning, shall be amended by addition of the following Article:**

**ARTICLE XIV Wellhead Protection Overlay District**

**§ 165-47. Purpose.**

A wellhead protection overlay district is established In order to assist in the preservation of public health, general welfare, and safety of the residents of the Town through the elimination or prevention of groundwater contamination in the vicinity of wells that supply public drinking water to residents of the Village of Cazenovia and surrounding areas.

**§ 165-48. Boundaries of the wellhead protection overlay district.**

The Wellhead Protection Overlay District includes the land area through which contaminants are reasonably likely to move toward and reach the water wells operated by the Village of Cazenovia. This area, termed the wellhead protection area, was delineated in the 2007 document entitled "*Wellhead Protection Plan for the Village of Cazenovia Water Supply*" prepared by the New York Rural Water Association. The Wellhead Protection Overlay District consists of the portions of the Zone of Contribution and the Watershed Zone located within the Town. These two different zones are delineated in the "*Wellhead Protection Plan for the Village of Cazenovia Water Supply*" that is on file with the Town Clerk.

**§ 165-49. Applicability of regulations.**

The Wellhead Protection Overlay District shall be considered as overlaying other existing districts as shown on the zoning map. Any uses permitted in the underlying district shall be permitted in the Wellhead Protection Overlay District except where the overlay district prohibits or imposes greater or additional restrictions and requirements. In any cases where conflicts arise between these requirements and any other existing regulations, the more restrictive regulations shall apply.

**§165-50. Prohibited uses and activities.**

Uses and activities prohibited in the Wellhead Protection Overlay District include the following:

- A. Airports, flying fields, airport terminals, and/or airport maintenance areas.

- B. Bottled water or bulk water facility, including supply source(s), pumping stations(s), etc.
- C. Car or vehicle washing establishment.
- D. Cemetery or crematory.
- E. Commercial garage or motor vehicle service.
- F. Commercial nursery or garden center.
- G. Concentrated animal feeding operation in areas outside of local agricultural district(s) created pursuant to New York State Agriculture and Markets Law.
- H. Convenience store associated with a filling station or gasoline service station.
- I. Establishments for the cleaning and servicing of catch basins, cesspools, septic tanks, sewers, tanks and boilers, or tank trucks.
- J. Facility with exterior storage or loading/unloading of hazardous substances.
- K. Filling station or gasoline service station.
- L. Fleet storage area (car, bus, truck, etc.), including a motor freight transportation or motor vehicle passenger terminal.
- M. Fuel oil dealer, or petroleum and petroleum products wholesaler, or wholesale distributor of crude petroleum and petroleum products.
- N. Golf course.
- O. High intensity use parking lot(s) defined as having average vehicle trip generation rates of 1,000 or greater per day. Typical use examples generating such rates include but are not limited to: fast-food restaurants, convenience stores, discount stores, discount clubs, lumber/home improvement stores, shopping centers, supermarkets, etc. In addition, some uses such as high-turnover (sit-down) restaurants, drugstores, drive-through banks, day care centers, schools, hotels/motels, park & ride lots, post offices, medical offices/clinics, hospitals, libraries, and other institutions may generate average vehicle trip generation rates of 1,000 or greater per day depending upon their size.
- P. Industrial or manufacturing facility subject to the NYSDEC State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges or the USEPA National Pollution Discharge Elimination System (NPDES) stormwater permit program.
- Q. Junkyard or vehicle salvage/recycling facility.
- R. Laundry, cleaning, or garment services, including drycleaners, coin-operated laundries, commercial or industrial laundries, carpet and upholstery cleaners, and linen supply services.
- S. Maintenance and repair shops for major or small household appliances and electrical entertainment devices (stoves, washers, televisions, DVD players, etc.) or low-power internal combustion engines or electric motors (chain saws, lawn mowers, snowmobiles, etc.).
- T. Marina or boat service/maintenance facility.
- U. Motor freight transportation (e.g. trucking) or motor vehicle passenger (e.g. bus) terminals.

- V. Municipal facility involving public works storage except for the storage of equipment and supplies necessary for the safe provision of public drinking water.
- W. Municipal or industrial sewage treatment facility with disposal of primary or secondary effluent.
- X. Pest control services or establishments engaged in the wholesale distribution of pesticides or herbicides.
- Y. Pet cemetery or pet crematory.
- Z. Pipelines that carry petroleum (other than natural gas) or hazardous substance/waste.
- AA. Quarry.
- BB. Stockpiling or storage of coal, deicing compounds, fertilizers, or other bulk chemicals except in structures designed to prevent contact with precipitation and constructed on low permeability pads.
- CC. Storage of manure, except for the primary purpose of agricultural use;
- DD. Surface land application of septage, sewage, sludge, or human excreta.
- EE. Wells or any other facility for oil, gas, gas storage, solution mining, brine disposal, or geothermal resources.
- FF. Any use or activity that involves the on-site disposal of solid waste, pathological or medical waste, petroleum, radioactive material, hazardous substances, hazardous waste, or process wastes, including aqueous-carried waste.

**§ 165-51. Impervious Coverage and Lot Size**

- A. Maximum Impervious Coverage.
  - (1) Except as hereinafter provided, within the Wellhead Protection Overlay District, no more than ten percent (10%) or eight-thousand (8,000) square feet of a single parent parcel or building site, whichever is greater, may be rendered impervious to infiltration. Maximum site impervious coverage calculations shall include all impervious surfaces with a minimum area of over one hundred (100) square feet.
  - (2) Impervious coverage may only exceed ten percent (10%) or eight-thousand (8,000) square feet of a single parent parcel or building site (whichever is greater) if a system of stormwater management and treatment is developed that results in the site's post-development annual stormwater recharge volume to ground water approximating the site's pre-development annual groundwater recharge volume. Such a system should also: preserve hydrologic conditions that closely resemble pre-development conditions, maintain or replicate the predevelopment hydrologic functions of storage, infiltration, and groundwater recharge; prevent untreated discharges; reduce or prevent flooding by managing the peak discharges and volumes of runoff; minimize erosion and sedimentation; prevent degradation of water by reducing suspended solids and other pollutants; and provide increased protection of sensitive natural resources.
- B. Minimum Lot Size.
  - (1) In the Wellhead Protection Overlay District, the minimum size for lots served by private sewage disposal systems (i.e. septic systems) shall be eighty-thousand (80,000) square feet.

- (2) In areas serviced by public sanitary sewer, the minimum size for lots in the Wellhead Protection District shall be that for the underlying zoning district.

**§ 165-52. Stormwater Management Standards.**

A. Stormwater Pollution Prevention Plan.

- (1) A Stormwater Pollution Prevention Plan (SWPPP) must be submitted to the Planning Board for any proposed use that is required to submit a site plan for review within the Wellhead Protection Overlay District (see § 165-53.). This plan will detail the site's stormwater management and treatment system, including the design and operational details that will: (1) reduce or eliminate erosion and sediment loading to water bodies during construction; (2) control the impact of stormwater runoff on the water quality of the receiving waters; (3) control the increased volume and peak rate of runoff during and after construction; and (4) maintain stormwater controls during and after completion of construction.
- (2) The SWPPP must meet applicable stormwater quality/quantity sizing criteria as well as performance criteria that are outlined in the latest New York State Stormwater Management Design Manual. The SWPPP should also contain sufficient information for the Town to evaluate the plan with respect to additional post-development stormwater management criteria (see below). It must be prepared and certified by a New York State licensed professional engineer or landscape architect, or a Certified Professional in Erosion and Sediment Control (CPESC).

B. Additional Post-Development Stormwater Management Criteria for the Wellhead Protection Overlay District

- (1) In addition to the quality/quantity sizing and performance criteria identified in the New York State Stormwater Management Design Manual, all projects in the Wellhead Protection Overlay District that are required to submit a Stormwater Pollution Prevention Plan (i.e. all projects that must submit a site plan within the Wellhead Protection Overlay District – see § 165-53) shall achieve the following performance standards:
  - (a) Groundwater Recharge. The annual recharge from the post-development site should reasonably approximate the annual recharge from the pre-development (existing) site conditions based upon soil types.
  - (b) Recharge Volume. The prescribed design volume of stormwater to be recharged on the site (the so-called Groundwater Recharge Volume,  $Re_v$ ) shall be determined by the method that is contained in Appendix C of the 2007 document entitled "*Wellhead Protection Plan for the Village of Cazenovia Water Supply*" prepared by the New York Rural Water Association. A copy of this document is filed with the Town Clerk. Different recharge values for soils may be used provided that on-site soil evaluations have been conducted and a professional geologist clearly demonstrates that the recharge rate differs from the listed values based upon soils, precipitation, and evapotranspiration.
  - (c) Hydrologic Conditions – The hydrologic conditions of the developed site must closely resemble pre-development conditions through adequate use of design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source.
  - (d) Sensitive Areas. Stormwater discharges to ground water shall not occur within a distance of 800 feet of any public water supply well operated by the Village of Cazenovia.

- (e) Pretreatment. Stormwater runoff shall be directed to pretreatment device(s) such as water quality inlets, sediment traps, drainage channels, water quality swales, etc. to help trap coarse materials before they enter the primary stormwater management and treatment practice(s).
- (f) Emergency Design Measures. Stormwater management and treatment systems should incorporate designs which allow for shut-down and containment in the event of an emergency spill or other unexpected contamination event.
- (g) Operation and Maintenance Plan. All stormwater management and treatment system must have an operation and maintenance plan to ensure that system(s) function as designed. Such a plan should include details on how post-construction inspection and long-term maintenance is to be carried out.
- (h) Performance Bond. In order to ensure that funds are available to finish the construction and ensure the proper functioning of stormwater management and treatment system(s), the Town shall require the developer or contractor to provide, prior to construction, a performance bond, escrow account certification, or irrevocable letter of credit from an appropriate financial or surety institution which guarantees satisfactory completion of the project and names the Town as the beneficiary. The security shall be in an amount to be determined by the Planning Board and Town Board based on submission of final design plans in the Stormwater Pollution Prevention Plan, and an evaluation of projected construction costs by the Town Engineer.
- (i) Maintenance Bond. Where stormwater management and treatment system(s) are to be operated and maintained by the developer or by a corporation that owns or manages a commercial or industrial facility, the developer, prior to final approval of construction, shall be required to provide the Town with a maintenance bond, escrow account certification, or irrevocable letter of credit from an appropriate financial or surety institution to ensure proper operation and maintenance of all stormwater management and treatment system(s) for a twenty year period. The estimated maintenance cost for the facilities shall be based on a reasonable estimate provided by the Town Engineer and adopted by the Town Board. The Maintenance Bond shall guarantee the stormwater facilities against design defects and/or failures in workmanship, and shall guarantee that the facilities constructed under the permit will be regularly and adequately maintained throughout the maintenance period. If the developer or owner fails to properly operate and maintain the stormwater management and treatment system(s), the Town may draw upon the account to cover the costs of proper operation and maintenance.

**§ 165-53. Site Plan Review Requirements**

- A. Uses requiring site plan review within the Wellhead Protection Overlay District.
  - (1) The Planning Board shall have site plan review and approval on any proposed use or activity requiring a building permit located partially or wholly within the Wellhead Protection Overlay District that meets one or more of the following conditions:
    - (a) The proposed use or activity would render impervious to infiltration ten percent (10%) or eight-thousand (8,000) square feet of a single parent parcel or building site, whichever is greater.
    - (b) The proposed use or activity is not served by public sanitary sewer and will generate more than a daily average of 1,000 gallons of wastewater.
    - (c) The proposed use or activity will extract more than 1,000 gallons per day of ground water.

B. Site plan submittal requirements within the Wellhead Protection Overlay District.

- (1) In addition to other information that may be required for a site plan submittal as indicated in Town Code, the following information shall be provided with a site plan for a proposed use or activity located partially or wholly within the Wellhead Protection Overlay District:
  - (a) Location of the proposed use or activity in relation to the Wellhead Protection Overlay District boundaries.
  - (b) Location and extent of existing (pre-development) and post-development impervious surfaces.
  - (c) Details regarding the proposed conveyance, storage, distribution, generation, handling, use, and/or treatment of any sewage, process wastes, aqueous-carried wastes, petroleum, hazardous substances, hazardous waste, solid waste, radioactive material, and/or incidental wastes. Include the estimated types and quantities of such materials to be located on-site.
  - (d) A Stormwater Pollution Prevention Plan (SWPPP) prepared in accordance with § 165-52.
  - (e) A description of all pollution control measures and activities proposed to prevent on-site disposal and potential contamination of ground water or surface water, including spill response activities.
  - (f) A statement as to the degree of threat to groundwater and surface water quality that could result if the control measures failed.
  - (g) A description of the provisions for the off-site disposal of any solid waste, petroleum, radioactive material, hazardous substances, hazardous waste, process wastes, and/or aqueous-carried waste (except sewage).
  - (h) If an on-site water supply is to be utilized, provide a description of the proposed means of water supply, including if applicable an estimate of the total daily groundwater withdrawal rate.
  - (i) Other information as necessary to fully explain the project and evaluate its potential impact upon the Village of Cazenovia's public water supply.

C. Site plan review criteria and procedures.

- (1) In addition to other site plan review criteria and procedures indicated in Town Code, the Planning Board shall also review all site plans located partially or wholly within the Wellhead Protection Overlay District as appropriate in terms of the following criteria:
  - (a) Adequacy of the Stormwater Pollution Prevention Plan in meeting criteria established in the New York Stormwater Management Design Manual as well as additional post-development stormwater management criteria identified in § 165-52.
  - (b) Adequacy of proposed control measures to prevent the on-site disposal of solid waste, pathological or medical waste, petroleum, radioactive material, hazardous substances, hazardous waste, or process waste, including aqueous-carried waste.

- (c) Adequacy of the provisions for off-site disposal of solid waste, hazardous waste, process waste, and other wastes generated.
- (d) The degree of threat to public water supply wells in the event that contamination control measures or devices at the site should fail.
- (e) Adequacy of spill response and containment plans to minimize groundwater or surface water contamination.
- (f) Adequacy of plans and resources to properly construct and regularly maintain contamination control devices.

D. Planning Board findings.

- (1) In addition to other considerations in Town Code, in order to approve a site plan for purposes of authorizing a building permit in the Wellhead Protection Overlay District, the Planning Board shall make the following findings:
  - (a) The proposed use and site plan comply with all regulations applicable to the Wellhead Protection Overlay District.
  - (b) The proposed use and site plan will not adversely impact the predevelopment hydrologic functions of the site, including the pre-existing volume of annual groundwater recharged at the site, the quantity and direction of pre-existing drainage eventually draining to the Zone of Contribution, etc.
  - (c) The proposed use will not adversely impact upon the pre-existing quality of ground water or surface water leaving the site's boundaries.
  - (d) The proposed use is to be located, developed, and maintained in such a manner as to not adversely impact the long-term quantity or quality of ground water available to public water supply wells operated by the Village of Cazenovia.

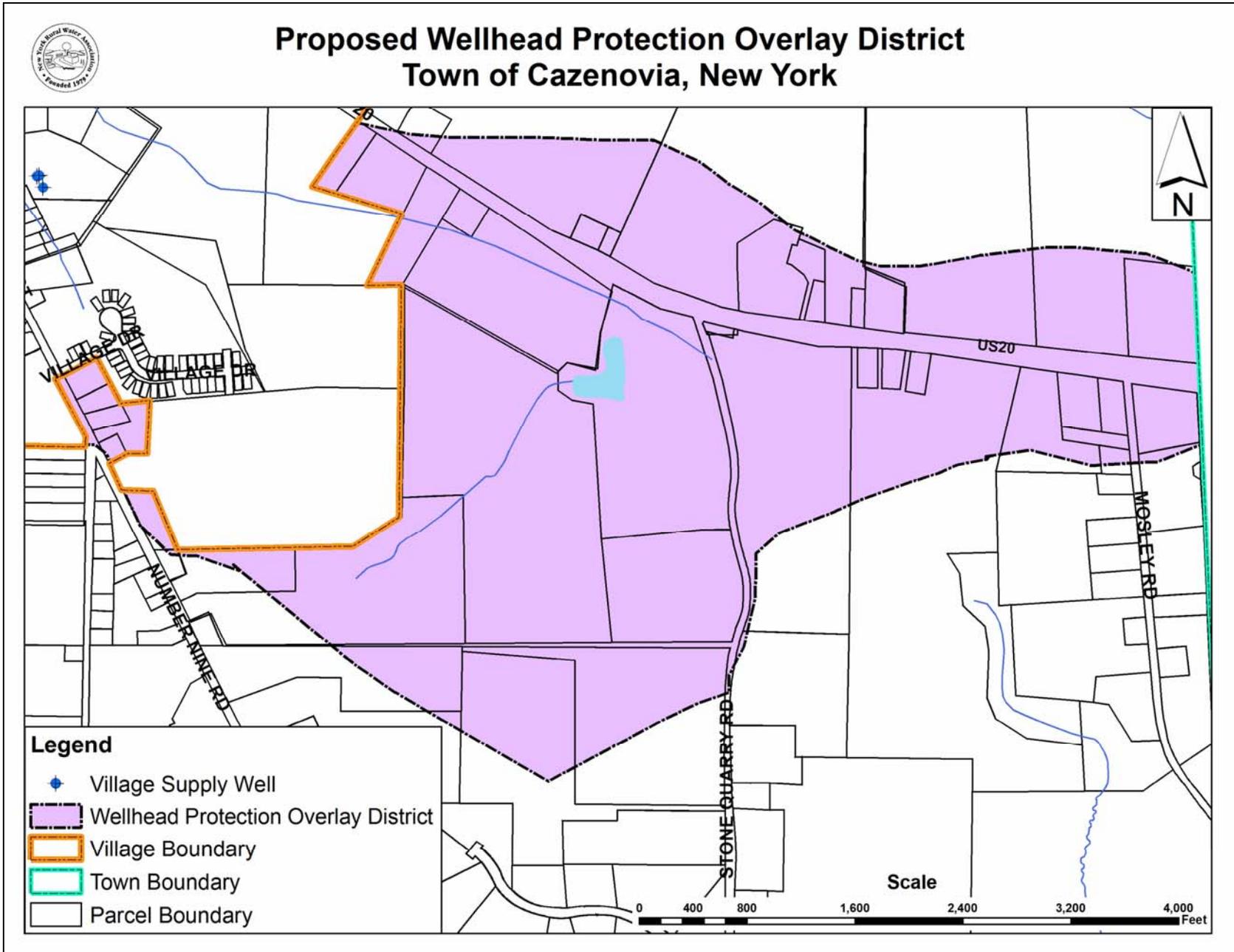
## **Section 5    Validity**

If any section or provision of this Local Law shall be adjudicated invalid for any reason, the same shall not affect the validity of the remainder of this Local Law.

All ordinances and Local Laws and parts thereof heretofore enacted by the Town are hereby declared to be superseded to the extent to which such ordinance or Local Law is inconsistent or in conflict with this Local Law.

## **Section 6    Effective Date**

This Local Law shall take effect upon its filing with the Secretary of State.



**APPENDIX C**  
**CALCULATION OF**  
**SITE GROUNDWATER RECHARGE VOLUME ( $RE_v$ )**

## Methodology to Calculate the Design Volume of Stormwater To Be Recharged to Groundwater On-Site

In order to ensure that annual recharge from the post-development site should approximate the annual recharge from the pre-development site conditions to the greatest extent practicable, one of the additional stormwater management criteria for the Wellhead Protection Overlay District is calculation of the so-called Groundwater Recharge Volume,  $Re_v$ . This is the post-development design recharge volume (i.e., on a storm event basis) required to minimize the loss of annual pre-development groundwater recharge. Many states have required the calculation of  $Re_v$  as part of their stormwater treatment practice sizing criteria.

$Re_v$  is considered part of the total Water Quality Volume ( $WQ_v$ ).  $WQ_v$  is the total volume of stormwater that needs to be captured and treated on-site and it is designed to represent the runoff from 90% of the average annual rainfall.

Since  $Re_v$  is a sub-volume of the total  $WQ_v$  that must be addressed at a site, if  $Re_v$  is treated upstream of  $WQ_v$ , then  $Re_v$  may be subtracted from the  $WQ_v$  when sizing water quality treatment (provided that the proposed infiltration measures are capable of infiltrating the required recharge volume). As with  $WQ_v$ , drainage areas having no impervious cover and proposed disturbance may be excluded from recharge volume calculations. If runoff from a rooftop area is allowed to effectively infiltrate into the soil, such impervious area may be deducted from the total impervious cover. This is not true if the roof is constructed of galvanized metal or copper (runoff from such surfaces should not be allowed to infiltrate into the soil for water quality purposes).

$Re_v$  is calculated from the following equation:

$$Re_v = \frac{S \cdot R_v \cdot A}{12}$$

where:  $Re_v$  = Groundwater Recharge Volume (acre-ft)  
 $R_v$  =  $0.05 + 0.009 \cdot I$  where  $I$  is the post-development site imperviousness (decimal, not percent)  
 $S$  = Soil Specific Recharge Factor (also referred to as the depth of runoff to be recharged - inches)  
 $A$  = Site area (acres)

Each Soil Specific Recharge Factor ( $S$ ) is based on the average annual recharge rate per hydrologic soil type divided by the annual rainfall, multiplied by 90%. Table 1 contains the average annual recharge rate for hydrologic soil groups A, B, C, and D and the corresponding  $S$  values.

In order to determine  $S$  values that are representative of the Cazenovia area and can be used to accurately calculate  $Re_v$  in the Wellhead Protection Area, New York Rural Water Association first compared two sources of information. One of these sources was a set of average annual recharge rates widely attributed by various states to the

United States Dept. of Agriculture’s Natural Resource Conservation Service (NRCS) (see Table 1). The other set of values were annual recharge rates for hydrologic soil groups calculated by the Chazen Companies (2006) for the Dutchess County Water and Wastewater Authority (Table 1). New York Rural Water Association adjusted the Dutchess County values to the mean precipitation of 42.5 inches in the Cazenovia area (Table 1). These adjusted annual recharge rates were used to calculate a composite annual recharge rate for the Cazenovia Wellhead Protection Area (12.21 inches/year). This value compared very closely to the mean annual natural groundwater recharge value mapped by Wolock (2003) for the region (12.17 inches/year).

The adjusted Dutchess County recharge rates were used to subsequently calculate S values for each soil type (Table 1). These values of the Soil Specific Recharge Factor (S) should be used to calculate  $Re_v$ .

<b>Hydrologic Soil Group</b>	<b>USDA Average Annual Recharge Rate (in/yr)</b>	<b>Dutchess County Average Annual Recharge Rate (in/yr)</b>	<b>Adjusted Dutchess County Average Annual Recharge Rate (in/yr)</b>	<b>Soil Specific Recharge Factor (S) (inches)</b>
<b>A</b>	<b>18</b>	<b>19.0</b>	<b>19.7</b>	<b>0.42</b>
<b>B</b>	<b>12</b>	<b>14.1</b>	<b>14.6</b>	<b>0.31</b>
<b>C</b>	<b>6</b>	<b>7.2</b>	<b>7.5</b>	<b>0.16</b>
<b>D</b>	<b>3</b>	<b>4.0</b>	<b>4.1</b>	<b>0.09</b>

**Table 1. Annual Recharge Rates and Soil Specific Recharge Factors .**

Figure C-1 is a map of the hydrologic soil groups in the Wellhead Protection Area for the Village of Cazenovia Water Supply. This map has been derived from digital soils mapping from the United States Natural Resources Conservation Service (NRCS) Madison County Soil Survey.

If on-site soil evaluations are to be used instead of the published NRCS mapping, the soil group classification shall be based on on-site percolation test(s) and the table below:

<b>Soil Group</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
Infiltration rate when wet (inches/hour)	> 0.3	0.15 – 0.3	0.05 – 0.15	0 – 0.05

Where more than one hydrologic soil group is present on a site, a composite or weighted recharge value should be calculated based upon the relative area of each soil group. The  $Re_v$  should be infiltrated in the most permeable soil group available on the site.



**Figure C-1**

