

TOWN OF DRYDEN
DRINKING WATER SOURCE PROTECTION
PROGRAM (DWSP2) PLAN



Technical Assistance Provided By:

New York Rural Water Association (NYRWA)

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1.0 INTRODUCTION

1.1 Background and Purpose

Source water includes surface water or groundwater used for drinking purposes. A source water protection plan identifies source water protection areas and potential sources of contamination, defines priorities, identifies protection strategies, defines implementation tasks and milestones, sets a timetable for achieving the plan goals, and outlines a process for periodically evaluating progress towards these goals.

Recently, New York State has prioritized updating assessments that were developed in the early 2000's as part of the Source Water Assessment Program (SWAP). These assessments delineated source water assessment areas, generated potential contaminant inventories, and developed susceptibility analyses for public water systems. In addition, New York State is now focused upon creating and implementing updated source water protection plans. This initiative has led to the development of the Drinking Water Source Protection Program (DWSP2). This program has issued a draft framework to help New York State communities build a tailored source water protection plan, known by the state as a Drinking Water Source Protection Program (DWSP2) Plan. This framework can be downloaded from:

https://www.dec.ny.gov/docs/water_pdf/dwsp2draftframework.pdf.

New York Rural Water Association (NYRWA), as a technical assistance provider, has pledged to follow the phases and components of the DWSP2 Plan Framework to the greatest extent practicable when working with a community on the development of a source water protection plan. This Drinking Water Source Protection Program (DWSP2) Plan for the Town of Dryden, developed with the assistance of NYRWA, is consistent overall with the DWSP2 Plan Framework.

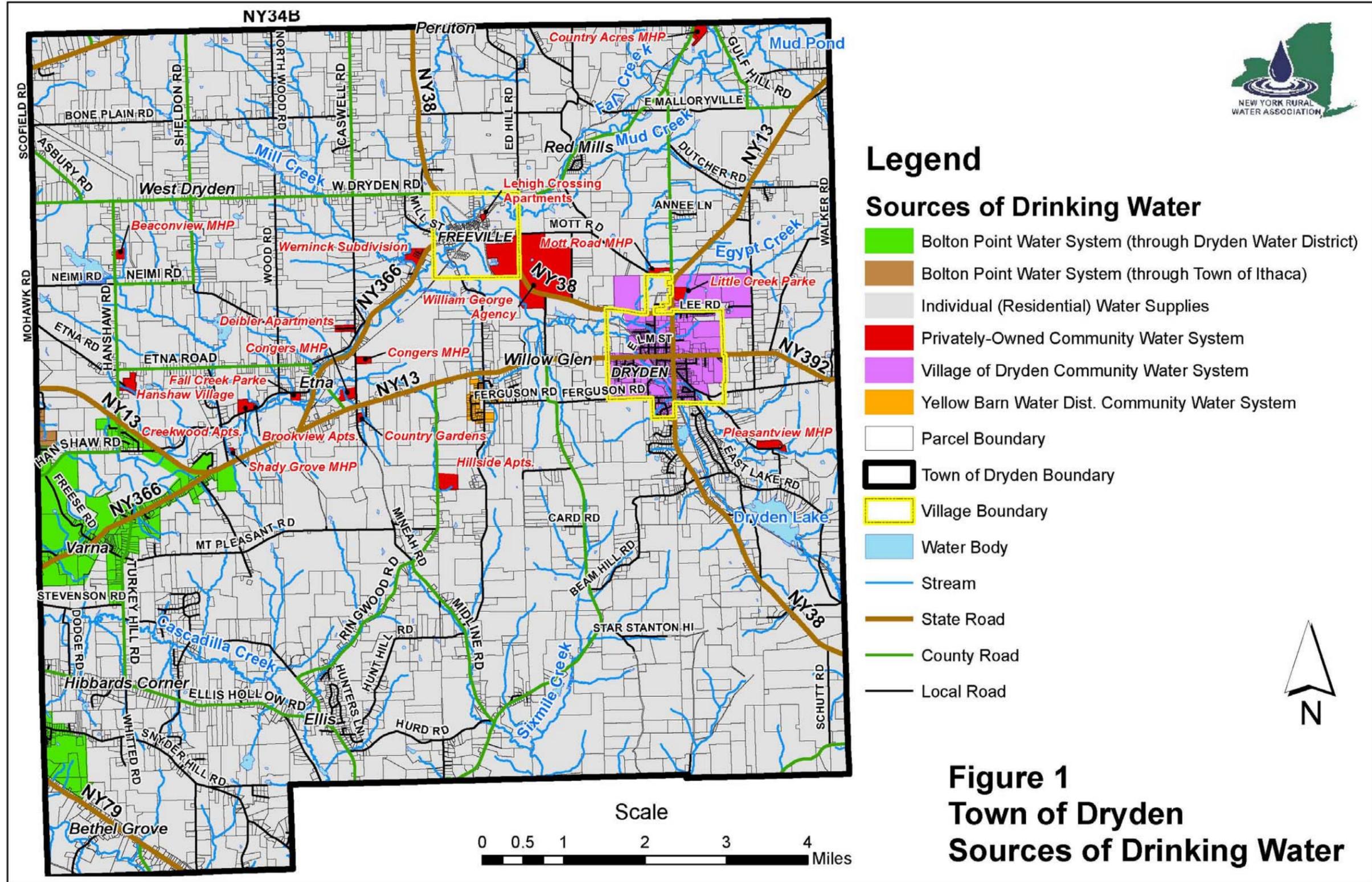
This plan is also one of two that has been developed for the Town of Dryden with the assistance of NYRWA for compatibility with the DWSP2 Plan Framework. The other DWSP2 plan includes one for the groundwater supply of the Yellow Barn Water District, an improvement district established by the Town Dryden.

This DWSP2 plan aims to protect the remaining drinking water sources located in Dryden for the residents and businesses of the Town. This includes the Village of Dryden supply sources, a number of privately-owned public water systems, as well as individual (residential) water supply (IWS) wells. Public water systems with sources in Dryden are indicated in Table 1. A map showing the source of drinking water for residents and businesses across Dryden is shown as Figure 1. Approximately 725 Town residents (from NYSDOH data) are supplied with drinking water from the Dryden Water District, which obtains its water from the Bolton Point Water System (Cayuga Lake source water). An additional population of 5,400 are served by the privately-owned public water systems, the Village of Dryden, and the Yellow Barn Water District. Based upon 2019 Census estimates, the remaining Town population of approximately 8,140 are thus supplied by individual (residential) water supply wells.

PUBLIC WATER SYSTEM NAME	SYSTEM POPULATION
BEACONVIEW MHP	110
BROOKVIEW APARTMENTS	45
CONGERS MOBILE HOME PARK	342
COUNTRY ACRES MHP	253
COUNTRY GARDENS	110
CREEKWOOD APARTMENTS	110
DEIBLER APARTMENTS	46
DRYDEN VILLAGE	2,000
FALL CREEK PARKE	90
HANSHAW VILLAGE	447
HILLSIDE APTS	37
LEHIGH CROSSING APARTMENTS	48
LITTLE CREEK PARKE	252
MOTT ROAD PARK, LLC	45
PLEASANTVIEW MOBILE HOME PARK	125
SHADY GROVE MOBILE HOME PARK	45
WERNINCK SUBDIVISION	48
WILLIAM GEORGE AGENCY	250
YELLOW BARN WATER DISTRICT	250

Note: System Population Data from NYSDOH

Table 1. Community Water Systems with Sources in Dryden



1.2 Planning Team (Stakeholder Group)

In 2014, the Town Board of the Town of Dryden passed a resolution to develop and implement a Source Water Protection Plan. In this resolution, a planning team (stakeholder group) was authorized to include one or more town board members, one or more planning department staff members, the Highway/DPW Superintendent, representatives from town boards/commissions, and representatives from non-governmental groups. This group met with NYRWA and provided community-specific guidance on the source water planning process.

1.3 Goals and Vision

From the 2014 Town Board resolution, the goals of Source Water Protection Plan in Dryden have been to (1) identify water supply resources and potential threats and (2) recommend and implement management strategies to protect the identified water sources. From the Town Board resolution, the vision of the Source Water Protection Plan is *“to ensure that any action taken to protect the Town’s water resources reflects the needs of the local community and is based on sound research and science”*.

2.0 DRINKING WATER SOURCE ASSESSMENTS

A drinking water source assessment includes: an overview of the Village of Dryden water system along with the privately-owned public water systems and IWS wells; a description of the varied hydrogeologic settings and sensitivity of well supplies in Dryden; delineation of drinking water source protection areas sources; and an inventory of potential contaminant sources that might lead to the release of contaminants within the delineated areas.

2.1 Overview of Drinking Water Systems

2.1.1 Village of Dryden

The Village of Dryden serves a population of approximately 2,000 residents, with about 800 connections. The system is supplied by five wells shown on Figure 2. Details about these five wells are in Table 2 below. In 2018, NYSDEC granted the Village a Water Withdrawal Permit (WWA No. 12321) that included the addition of the two Dryden Lake Wells. These wells were drilled to reduce elevated naturally-occurring arsenic levels associated with the Jay Street Well. The permit authorizes the Village to withdraw a total of up to 612,000 gallons per day (gpd) from the five wells. During the time period from 2016 to 2019, the Village water usage averaged 155,000 gpd. The highest single day use each year averaged 442,000 gpd during this time period. The water from the supply wells is disinfected with chlorine gas and treated with a chemical for corrosion control.

Based upon annual water quality reports and data from USEPA’s Safe Drinking Water Information System (SDWIS), no chemical parameter has been detected above Maximum Contaminant Levels (MCLs) in Village water other than arsenic (last detected above the MCL in 2018). Water testing in Miller and Bugliosi (2013) of the Village’s supply wells

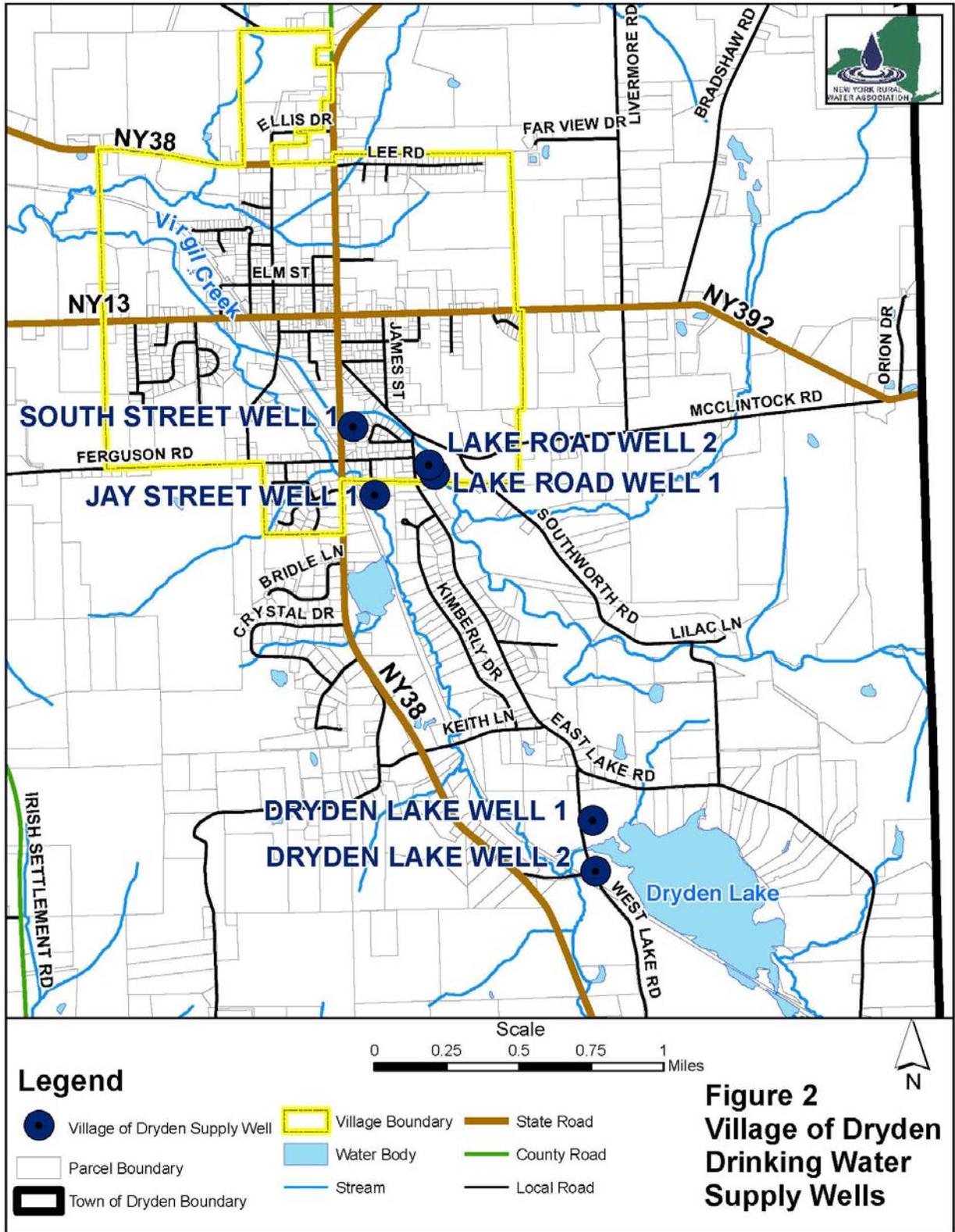


Figure 2
Village of Dryden
Drinking Water
Supply Wells

Well	Year Drilled	Diameter (inches)	Well Depth (feet)	Screened Interval (feet)	Source Capacity (gpm)	Aquifer Layer
South Street Well	1986	12	180	155 - 180	120	Lower S&G
Jay Street Well	1998	8	72	62 - 72	105	Middle S&G
Lake Road Well 1	1963		53	41 - 53	80	Upper S&G
Lake Road Well 2	1964		51	39 - 51	80	Upper S&G
Dryden Lake Well 1	2016	12	235	225 - 235	600	Lower S&G
Dryden Lake Well 2	2016	12	230	220 - 230	250	Lower S&G

Table 2: Village of Dryden Supply Well Data

indicated that the water from the supply levels is hard, but with levels of sodium and chloride quite low (below the median value of other public wells that tap similar aquifer systems). Similarly, nitrate levels are very low. In fact, they are consistently below detection limits.

2.1.2 Privately-Owned Community Water Systems

A population of over 3,100 in Dryden reside in apartments, mobile home parks, and residential institutions that have their own source of water and operate as community water systems (a type of public water system). There are seventeen such privately-owned community water systems in the Town of Dryden (Table 1). All of these systems rely upon wells for their source of supply. NYRWA has compiled data on these supply wells from the Tompkins County Department of Health and other sources such as the United States Geological Survey (USGS) and the NYSDEC. Table 3 is the resulting data compilation. Data on these wells, particularly those that are older, is frequently incomplete. An online review using the USEPA’s Safe Drinking Water Information System (SDWIS) did not reveal any health-based water quality violations for these water systems.

2.1.3 Individual Water Supply (IWS) Wells

As indicated above, the majority of households in Dryden rely upon individual private water supply wells. These wells range widely in age and construction. In a 2016 survey that NYRWA conducted of homeowners with IWS wells in Dryden, eighty percent of indicated that their well was drilled prior the year 2000.

Since 2000, water well contractors must notify NYSDEC prior to commencement of drilling a water well and file a Water Well Completion Report with NYSDEC upon completion of a water well. A copy of this report must also be provided to the owner of the water well. In addition, there are now minimum standards for the construction, renovation, development, and abandonment of drinking water wells.

Although NYSDEC water well completion reports are required to be submitted, water quality testing of IWS wells are not mandated by state or local regulations. Tompkins

Town of Dryden Draft DWSP2 Plan

PUBLIC WATER SYSTEM NAME	SYSTEM POPULATION	WELL NO.	DIAMETER (IN.)	WELL DEPTH	CASING DEPTH	SCREENED INTERVAL	BEDROCK DEPTH	YIELD	AQUIFER TYPE
BEACONVIEW MHP	110	1		44	32			10	Bedrock?
BROOKVIEW APARTMENTS	45	1		103	103				Unconsolidated?
CONGERS MOBILE HOME PARK	342	1-1		100					
CONGERS MOBILE HOME PARK	342	2-1		100					
COUNTRY ACRES MHP	253	1	12	38	38			30	Unconsolidated?
COUNTRY ACRES MHP	253	2	6	28	28			55	Unconsolidated?
COUNTRY GARDENS	110	1		215	75				
COUNTRY GARDENS	110	2		190					
COUNTRY GARDENS	110	3		420	47		44	2.5	Bedrock
CREEKWOOD APARTMENTS	110	1	6	138	138			10	Unconsolidated
CREEKWOOD APARTMENTS	110	2	6	220	106		104	12	Bedrock
CREEKWOOD APARTMENTS	110	3	6	160	121		120	75	Bedrock
DEIBLER APARTMENTS	45	1							
DEIBLER APARTMENTS	45	2							
DEIBLER APARTMENTS	45	3							
DEIBLER APARTMENTS	45	4							
DEIBLER APARTMENTS	45	5		140				12	
DEIBLER APARTMENTS	45	6		130				12	
FALL CREEK PARKE	90	1	6	183	183			10	Confined Unconsolidated
HANSHAW VILLAGE	447	1	6	172	125		122	75	Bedrock
HANSHAW VILLAGE	447	2	6	170	144		141	50	Bedrock
HANSHAW VILLAGE	447	Pumphouse	6	115			15	5	Bedrock
HILLSIDE APTS	37	3		170	20		5		Bedrock
LEHIGH CROSSING APARTMENTS	48	1	8	161	162		>161	33	Confined Unconsolidated
LITTLE CREEK PARKE	252	1	6	132.5	52.5		52.5	35	Bedrock
LITTLE CREEK PARKE	252	2	6	38.6		30.6 - 38.6		50	Confined Unconsolidated
MOTT ROAD PARK, LLC	45	1	6	100					Confined Unconsolidated?
PLEASANTVIEW MOBILE HOME PARK	125	2		100					Confined Unconsolidated?
SHADY GROVE MOBILE HOME PARK	45			87					
WERNINCK SUBDIVISION	48	1		275				30	
WILLIAM GEORGE AGENCY	250	1	6	79					Confined Unconsolidated
WILLIAM GEORGE AGENCY	250	2	6	230					Bedrock

Table 3. Privately-Owned Community Water System Well Data

County Health Department does recommends testing after shocking of a new water well for coliform bacteria, chloride, lead, nitrates, nitrites, iron, manganese, sodium, pH, hardness, alkalinity, and turbidity.

From the 2016 water well survey, 88 percent of respondents indicated water quality issues. Hardness, iron, sediment, and odor were among the numerous issues (see Figure 3 below). Nearly eleven percent of residents indicated that their well had tested positive for coliform bacteria.

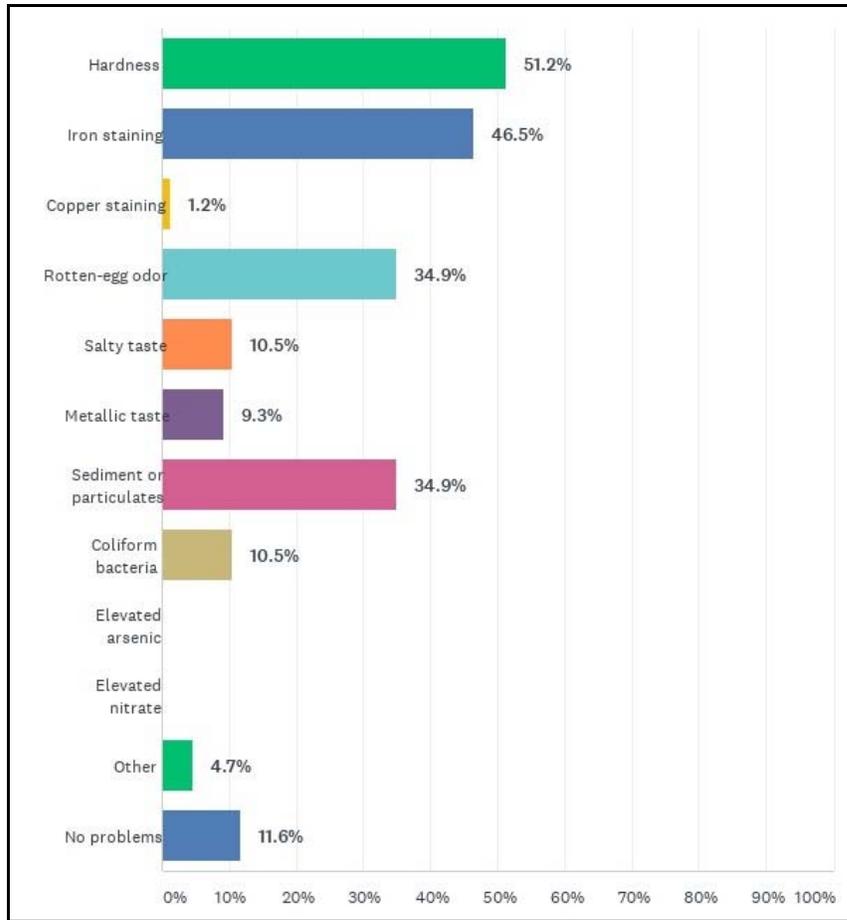


Figure 3. Self-Reported Water Quality Issues with IHS Wells

NYRWA obtained the Water Well Completion Reports for wells drilled in Dryden as well as the corresponding data in Geographic Information (GIS) format. Based upon these completion reports, sixty-six percent (66%) of water wells drilled in Dryden since 2000 have been completed in bedrock. These wells have a median depth of 180 feet and a median yield of 5 gallons per minute (gpm). More than one-third (36%) of bedrock wells have yields less than the 5 gpm required by the Federal Housing Administration (FHA) for new construction home loans. Twenty-one percent of such wells yield less than the 3 gpm required by FHA for new home loans.

In contrast, the median depth of wells completed in unconsolidated deposits (the material above bedrock) is 82 feet and the median yield is 12 gpm. Only ten percent of wells

finished in unconsolidated deposits yield less than 5 gpm, and just three percent of wells yield less than the 3 gpm.

2.2 Hydrogeologic Setting

2.2.1 Topography and Drainage

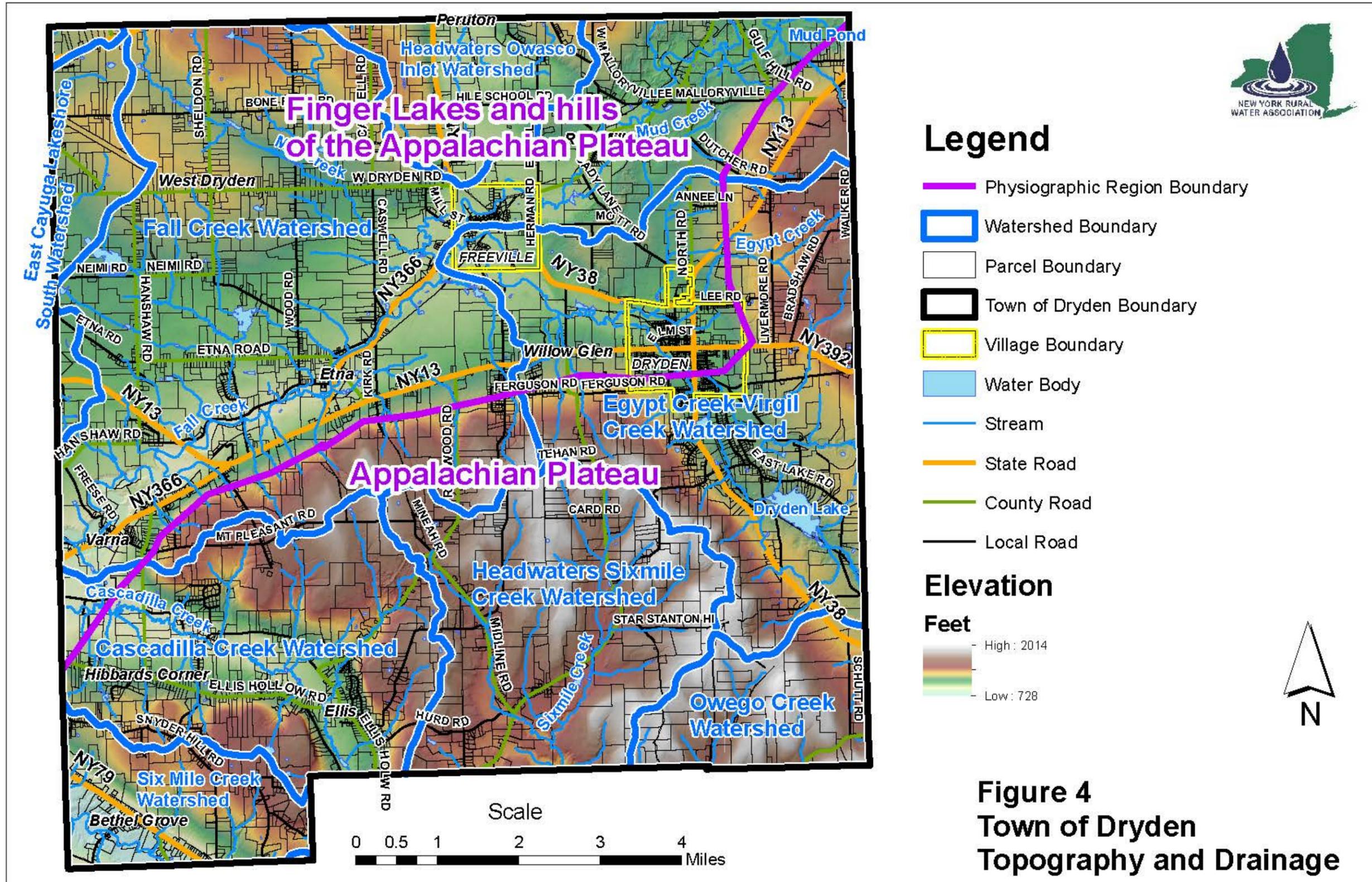
Dryden lies within the Appalachian Plateau physiographic region. The portion of Dryden situated approximately northwest of Route 13 is a region that the USGS has described in its aquifer studies in Tompkins County as a heavily-dissected portion of the plateau termed the “*Finger Lakes and hills of the Appalachian Plateau*” (see Figure 4). Elevations in this area of Dryden range from 725 to 1,400 feet above sea-level. In contrast, elevations in the remaining portion of the Appalachian Plateau to the south and southwest in Dryden can exceed elevations of 2,000 feet above sea-level (Figure 4).

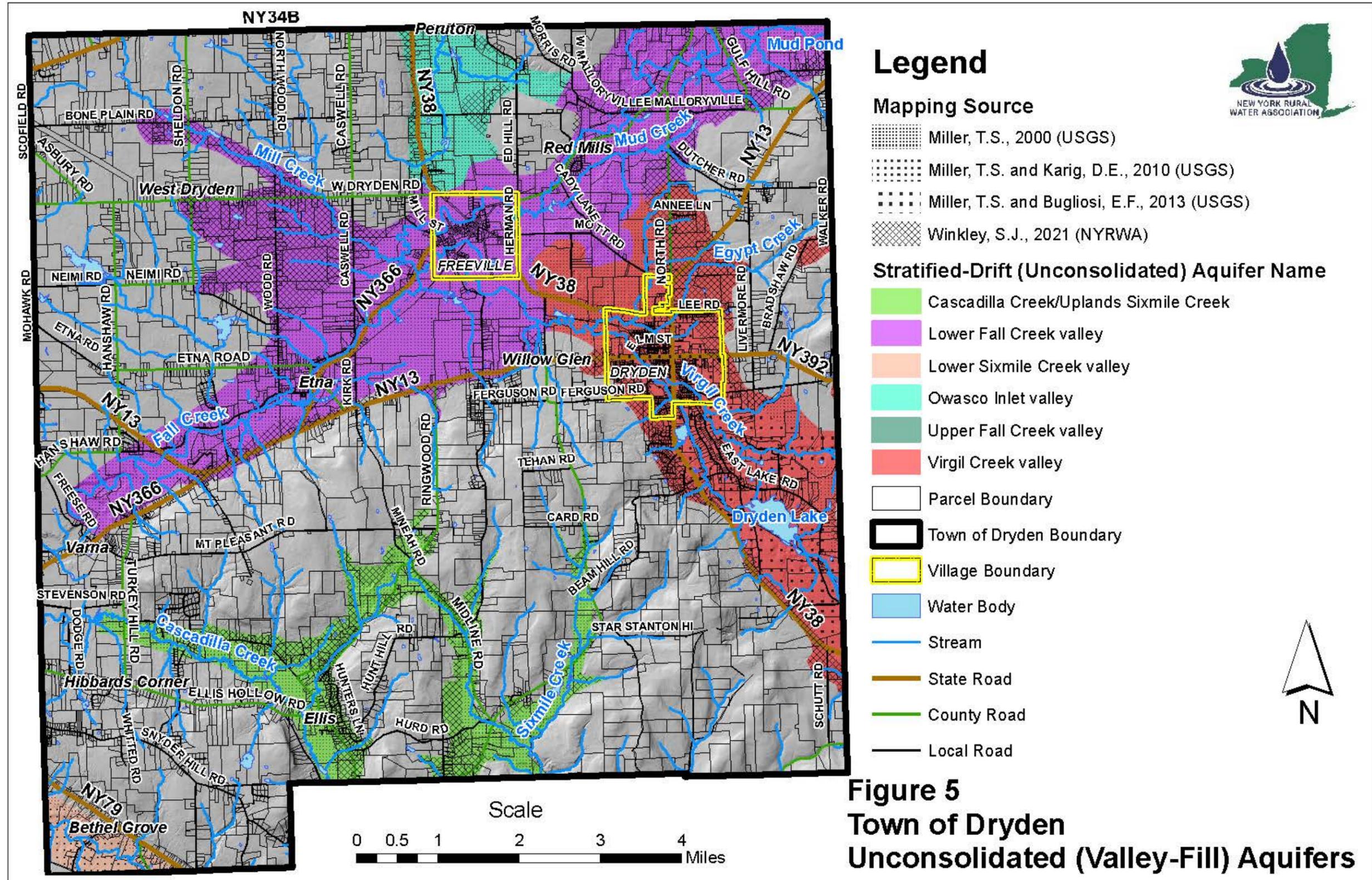
The valleys that have been dissected into the Appalachian Plateau in Dryden include those of Sixmile Creek (which is the water supply source for the City of Ithaca), Cascadilla Creek, Virgil Creek, Fall Creek (the drinking water source for Cornell University), and Owasco Inlet (Figure 4). These stream valleys have been modified to varying degrees by glaciation. The watersheds for these streams are mapped on Figure 4. The largest watershed in Dryden is the area that drains to Fall Creek. With the exception of the area within the Owasco Inlet Watershed, all the remaining portions of Dryden drain eventually into Cayuga Lake.

2.2.2 Valley-Fill (Unconsolidated) Aquifers

Miller, T.S. (2000) identified 17 reaches of valley-fill aquifers in Tompkins County (see Dryden’s aquifers on Figure 5). These valley-fill aquifers, also referred to as stratified-drift or unconsolidated aquifers, consist of sand and gravel that can be capable of supplying large quantities of water to properly-constructed wells. The USGS, in cooperation with the Tompkins County Planning Department and various local governments, have conducted a series of detailed studies to better understand these unconsolidated aquifers. In Dryden, detailed USGS studies were conducted by Miller and Karig (2010) and Miller and Bugliosi (2013) of the Sixmile Creek and Virgil Creek - Dryden Lake Valleys respectively (Figure 5). The latter study was paid in part by the Town of Dryden. The USGS, with the support of Tompkins County, the Town of Dryden, and Cornell University, has recently initiated a detailed aquifer study for the Lower Fall Creek Aquifer. In addition, the USGS has been working on detailed aquifer mapping in the Owasco Inlet valley in cooperation with the NYSDEC. No details on publication of this mapping is available at the time of writing of this plan.

In addition to the detailed work by the USGS in Dryden and surrounding communities, Steven Winkley, P.G. of the NYRWA used data from some 850 wells as well as detailed LiDAR-derived elevation data to augment mapping of unconsolidated aquifers. The extent of this additional reconnaissance mapping is shown on Figure 5. It is anticipated





that the Owasco Inlet and Lower Fall Creek Aquifer mapping will supplant this mapping by NYRWA once the USGS data is publicly available.

In the Virgil Creek and Dryden Lake valley, Miller and Bugliosi (2013) determined that most wells here tap one of three different confined aquifers. These sand and gravel aquifers vary widely in thickness from 5 to 50 feet, and are confined above and below by material with considerably less permeability such as unstratified material known as glacial till or lacustrine clay, silt, and very fine sand. The Village of Dryden water supply wells intersect these different confined aquifers referred to as the upper, middle, and lower sand and gravel (S&G) (see Table 2). The confined aquifers are laterally quite extensive, and range in depth from as shallow as 20 feet in the case of the upper confined aquifer to as deep as 250 feet for the lower confined aquifer (Miller and Bugliosi, 2013). The presence of these aquifers are likely the result of a fluctuating glacial ice margin (Miller and Bugliosi, 2013).

Sources of recharge to the confined aquifers that feed the Village supply wells were attributed by Miller and Bugliosi (2013) to be from precipitation that falls directly on the valley-fill sediments (including coarse-grained kame deposits along the edges of the valley), stream leakage, seepage from wetlands and ponds, and unchanneled runoff and groundwater inflow from the uplands. In the vicinity of the South Street Well, Jay Street Well, and Lake Road Wells, the confining units are thicker and more effectively confine the aquifers than in the southern part of the Virgil Creek and Dryden Lake valley (Miller and Bugliosi, 2013). Miller and Bugliosi (2013) indicated that recharge to the confined aquifers was greatest in the Virgil Creek valley where the upper confined aquifer outcrops at the land surface and in the southern portion of the valley south of Dryden Lake where the confining units are thinner and “windows” may occur in the confining units.

Review of well records in the area of the Lower Fall Creek Aquifer by NYRWA also reveal the existence of various sand and gravel aquifer layers. These layers are confined by finer-grained lacustrine material (clay, silt, very fine sand) and till. There appears to be at least two confined sand and gravel units in the Lower Fall Creek Aquifer ranging in depth from as shallow as 30 feet to a basal aquifer as deep as 245 feet. The deepest portion of the confined aquifer occurs in the Freeville area. Accumulations of sand and gravel occur along the valley walls in some reaches of the Lower Fall Creek Aquifer. These areas may provide areas of recharge to the confined aquifers.

Limited water well data in the Owasco Inlet valley also indicates multiple confined sand and gravel layers. In contrast to the multiple confined aquifers of the other valleys, there appears to be a single basal confined aquifer across the small sliver of the Lower Sixmile Creek valley that intersects the Town of Dryden (Miller and Karig, 2010).

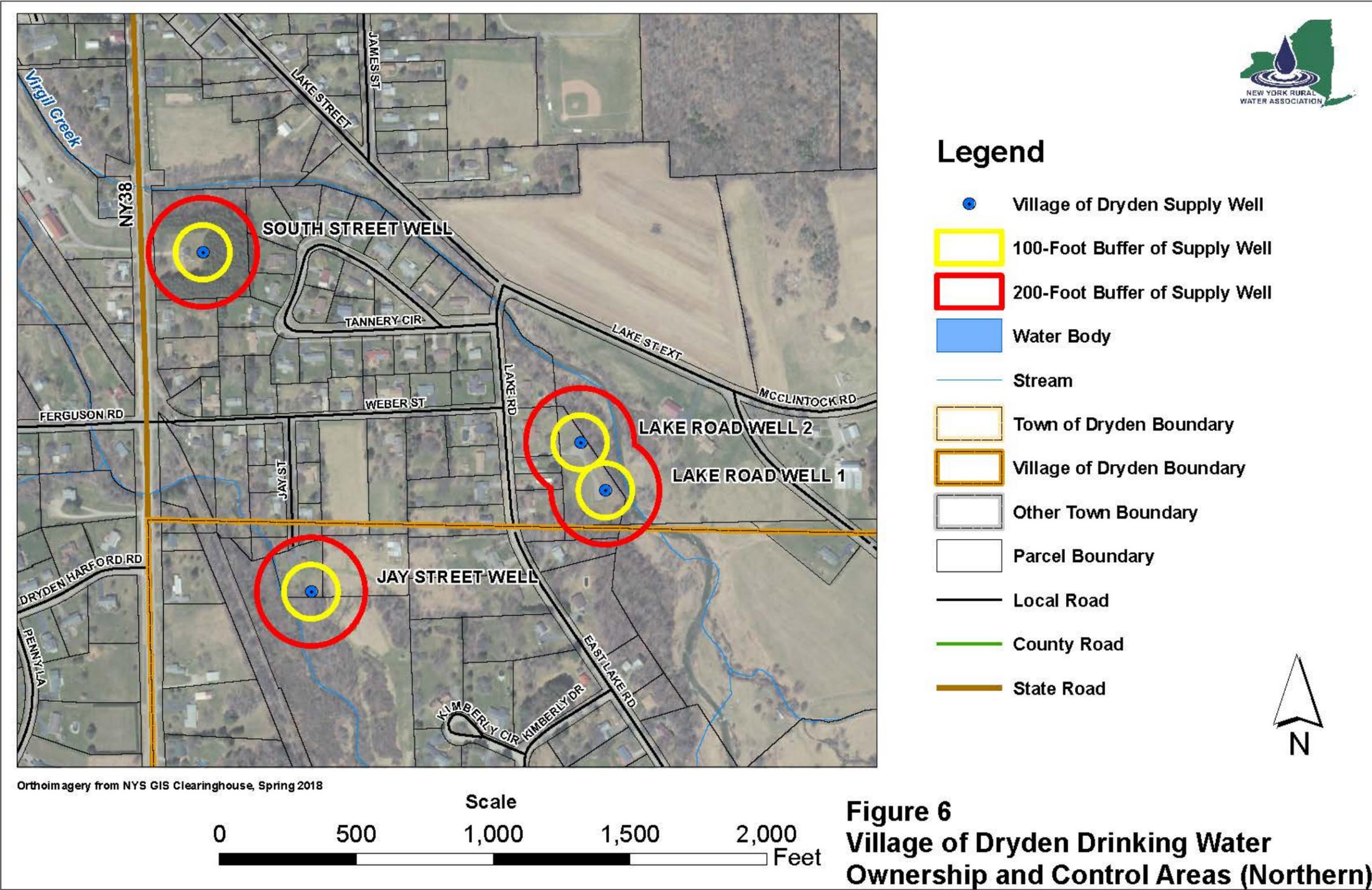
2.2.3 Bedrock (Uplands)

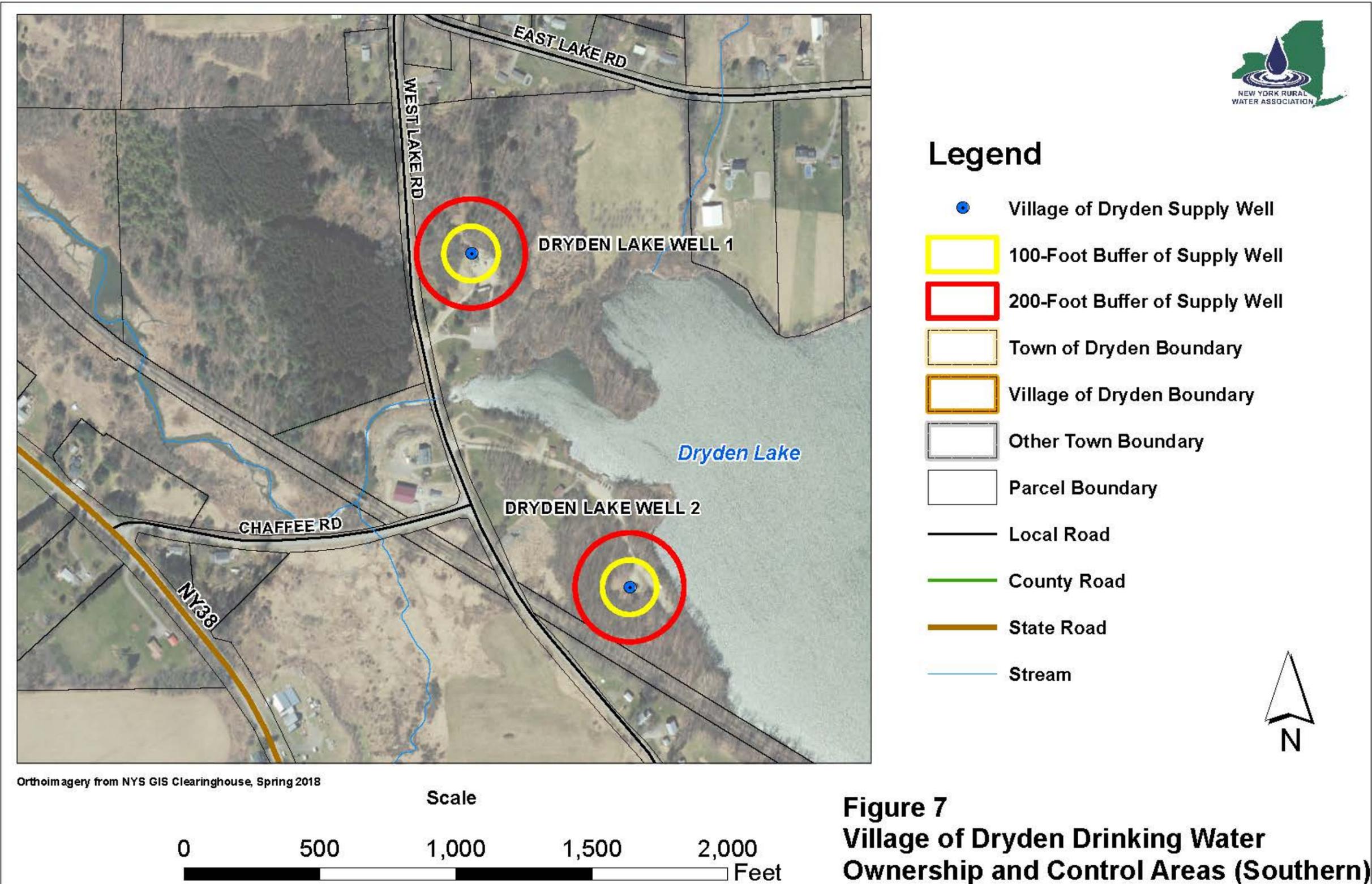
The areas between valley reaches shown on Figure 5 are referred to as uplands. The uplands region in Dryden is largely covered by a highly varying thickness of unstratified till that is underlain by bedrock. In some places in the uplands, bedrock outcrops at the land surface. Based upon water well data, the median depth to bedrock across the uplands region in Dryden is 32 feet. The bedrock that occurs throughout Dryden and serves as the drinking water source for IWS and public water supply wells in the uplands consists chiefly of shales and siltstones, relatively fine-grained rocks. These rock types primarily produce water to wells from fractures in the bedrock. Due to the localized distribution of these fractures, it is very difficult to predict bedrock yields and sometimes well yields can be limited in the uplands. Note that over two-thirds of respondents to the 2016 NYRWA well survey that indicated they had issues with water quantity lived in the uplands region of Dryden.

As indicated earlier, more than one-third (36%) of bedrock wells in Dryden have yields less than the 5 gpm required by FHA for new construction home loans. The method and duration of test pumping to determine safe yield may actually overstate the true long-term sustainable yields of some of these wells. Most of the yields reported by water well contractors were based upon bailing (use of a cable-tool rig) or air lifting (use of an air rotary rig) rather than the use of a test pump. These methods for testing yield typically are not performed for 4 hours and do not involve water level measurements to document drawdown stabilization. NYSDOH standards specify that a standard well yield test should include a minimum four-hour period of stabilized drawdown while pumping at a constant flow rate with water level measurements determined during the test. However, these standards do allow bailing or air lifting rather than the use of a pump when the planned well water use is less than 500 gallons per day (a home utilizes approximately 100 gallons per day per bedroom).

2.3 Drinking Water Source Protection Areas

Drinking water source protection areas are established to protect against different classes or types of contaminants. For wells serving public water systems, there are various protection areas that can be identified. These include: (1) the ownership and control area (required); (2) the critical area; and (3) the source water area. The required ownership and control area is mandated under the New York State Sanitary Code such that the owner of the public water system possesses 100 feet ownership around the well and controls land activities within 200 feet of the well. The critical area is an area surrounding the supply well(s) where it takes relatively less time to reach the drinking water source. Ideally this is based upon a certain time-of-travel to the well. Finally, the source water area is beyond the critical area and includes an area that still contributes water to the well(s) either at a longer time-of-travel or indirectly such as through surface water runoff for eventual groundwater recharge.





2.3.1 Village of Dryden

The ownership and control area around each of the Village supply wells is indicated on Figures 6 and 7. The Village owns and controls the 100-foot and 200-foot buffer areas around the South Street Well (Figure 6). It owns much of the 100-foot buffer around the Lake Road Wells but does not control the full 200-foot area here. It owns a portion of the 100-foot area around the Jay Street Well, but does not control much of the 200-foot area around this well. In addition, this well is actually situated outside of the Village limits. Note that although some of the 100- and 200-foot separation distances are not met, the highly confined nature of the aquifers in question affords a high degree of sanitary protection. The Dryden Lake wells which intersect the deepest of the confined aquifers, are situated in the Town of Dryden on park land owned by NYSDEC (Figure 7). This park, though NYSDEC-owned, is operated by the Town of Dryden.

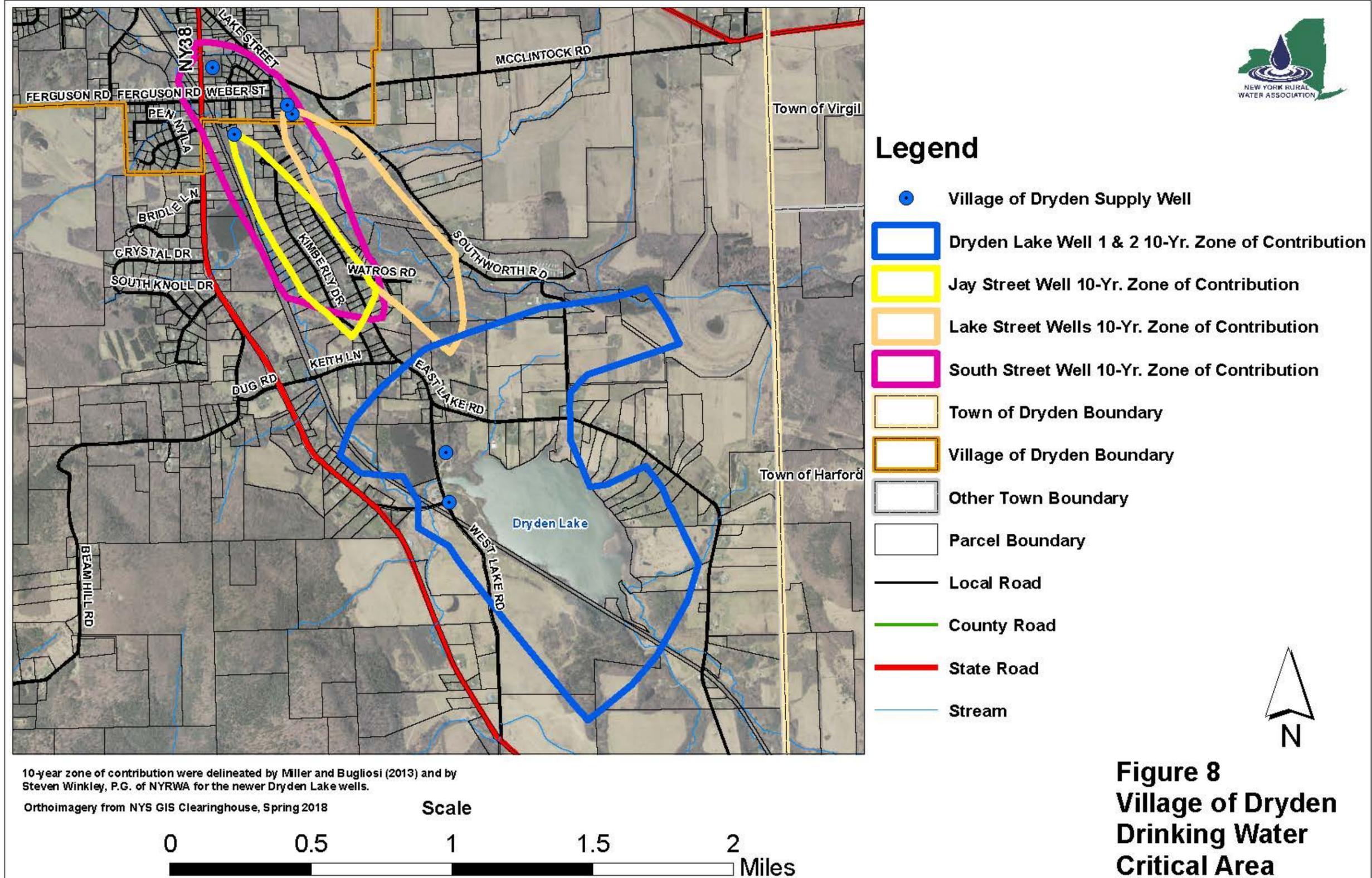
Miller and Bugliosi (2013) mapped the zones of contribution of the older Village wells through detailed numerical modeling. NYRWA selected the ten year time-of-travel threshold for the critical area threshold since the USGS identified the time-of-travel to the supply wells in ten-year contour intervals. Using pumping test data for the newer Dryden Lake wells, NYRWA calculated and mapped the approximate ten-year zone of contribution for these two wells by superimposing their cone(s) of depression onto the lower aquifer potentiometric surface determined by the USGS. The critical area for the Village supply wells is mapped on Figure 8. The critical area for the Jay Street Well, Lake Road Wells, and South Street Well covers 448.7 acres and the critical area the Dryden Lake wells is 635.5 acres.

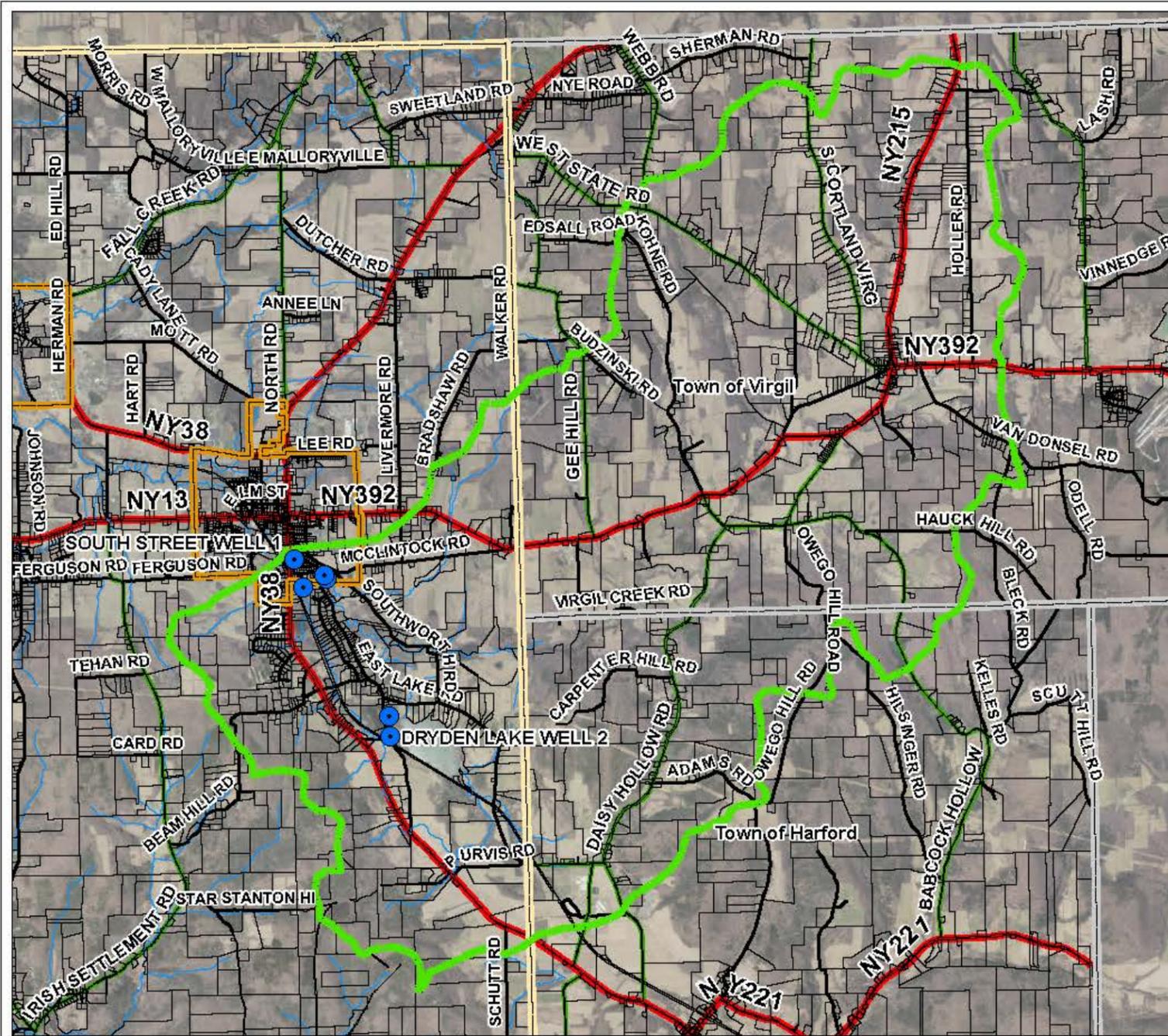
The source water area for the Village of Dryden supply wells is depicted on Figure 9. This large area encompasses 30.8 square miles and includes portions of three towns (the Town of Dryden and the Towns of Harford and Virgil in Cortland County). It is the area that not only encompasses longer times-of-travel in the aquifer itself, but also includes the area that supplies surface water runoff for eventually recharge to the confined valley-fill aquifer system.

2.3.2 Privately-Owned Community Water Systems

Due to uncertainties and a lack of positional accuracy, the 100-foot and 200-foot radii of the ownership and control area could not be mapped for the various privately-owned community water system wells in Dryden. Instead, a 500-foot area referred to as the inner well zone has been conservatively mapped around these privately-owned community water supply wells (see Figure 10). This inner well zone is consistent with that specified by the NYSDOH SWAP.

In the absence of information on groundwater flow, pumping rates, well construction, etc. a precise zone of contribution cannot be delineated for the various privately-owned wells. Thus, an outer well zone with a fixed radius of up to one mile in all directions around the wells was delineated (Figure 10). This is again consistent with the SWAP. Note that much of the outer well zone for privately-owned community wells in Dryden is concentrated in the Lower Fall Creek Aquifer.





Legend

- Village of Dryden Supply Well
- Source Water Area
- Town of Dryden Boundary
- Village of Dryden Boundary
- Other Town Boundary
- Parcel Boundary
- Local Road
- County Road
- State Road
- Stream



Orthoimagery from NYS GIS Clearinghouse, Spring 2018

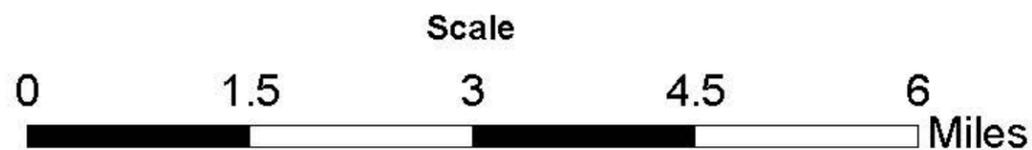
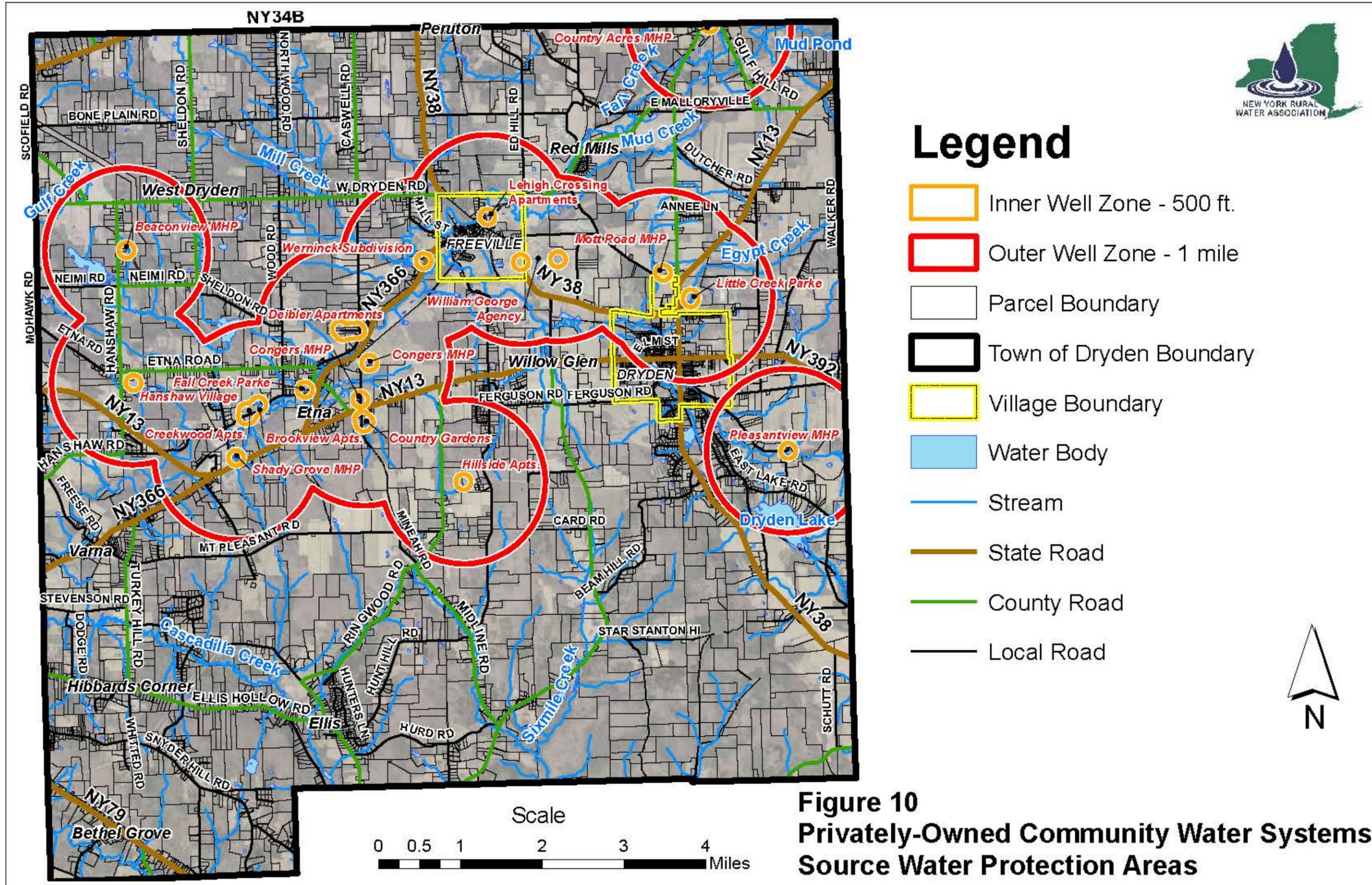


Figure 9
Village of Dryden Drinking Water
Source Water Area



2.3.3 IWS Wells

It is not possible to map protection areas around all individual water supply (IWS) wells. However, it is important to note that New York State regulations Part 5, Subpart 5-1 - Appendix 5B specifies separation distances of drinking water wells from potential sources of contamination. The specified separation distances in these regulations, shown in Figure 11 below, should be exceeded by 50% whenever the source of water for the well is at a depth of less than 50 feet.

Contaminant Source	Distance (Feet) ¹
Chemical storage sites not protected from the elements (e.g., salt and sand/salt storage) ²	300
Landfill waste disposal area, or hazardous or radiological waste disposal area ²	300
Land surface application or subsurface injection of effluent or digested sludge from a Municipal or public wastewater treatment facility	200
Land surface application or subsurface injection of septage waste	200
Land surface spreading or subsurface injection of liquid or solid manure ³	200
Storage Areas for Manure piles ⁴	200
Barnyard, silo, barn gutters and animal pens ^{5, 6}	100
Cesspools (i.e. pits with no septic tank pretreatment)	200
Wastewater treatment absorption systems located in coarse gravel or in the Direct path of drainage to a well	200
Fertilizer and/or pesticide mixing and/or clean up areas	150
Seepage pit (following septic tank) ⁵	150
Underground single walled chemical or petroleum storage vessels	150
Absorption field or bed ⁵	100
Contained chemical storage sites protected from the elements (e.g. salt and sand/salt storage within covered structures) ⁷	100
Septic system components (non-watertight) ⁵	100
Intermittent sand filter without a watertight liner ⁵	100
Sanitary Privy pit ⁵	100
Surface wastewater recharge absorption system constructed to discharge storm water from parking lots, roadways or driveways ⁵	100
Cemeteries	100
Sanitary privy with a watertight vault	50
Septic tank, aerobic unit, watertight effluent line to distribution box	50
Sanitary sewer or combined sewer	50
Surface water recharge absorption system with no automotive-related Wastes (e.g., clear-water basin, clear-water dry well)	50
Stream, lake, watercourse, drainage ditch, or wetland	25
All known sources of contamination otherwise not shown above	100

Table 4. Required Minimum Separation Distances to Protect Water Wells

2.4 Potential Contaminant Source Inventory

The next portion of the drinking water source assessments in Dryden consists of an inventory of potential contaminant sources within the identified protection areas. The DWSP2 Plan Framework completed by New York State to assist with development of a protection plan contains a list of potential sources of contamination that may impact the quality of drinking water sources, if improperly managed.

The hydrogeologic framework of Dryden is such that the major sources of drinking water utilized by both public suppliers and individual water supply (IWS) wells are frequently confined by finer-grained lacustrine sediments and/or till. That means that water supplies in Town are less influenced by activities at the land surface due to the slow nature of recharge through the overlying unconsolidated material. However, confined aquifers can still be prone to contamination due to improper well construction or well abandonment. In addition, some areas of Town contain more permeable soils and surficial geologic materials that provide higher recharge rates if hydraulically connected to the underlying confined aquifers.

2.4.1 Village of Dryden

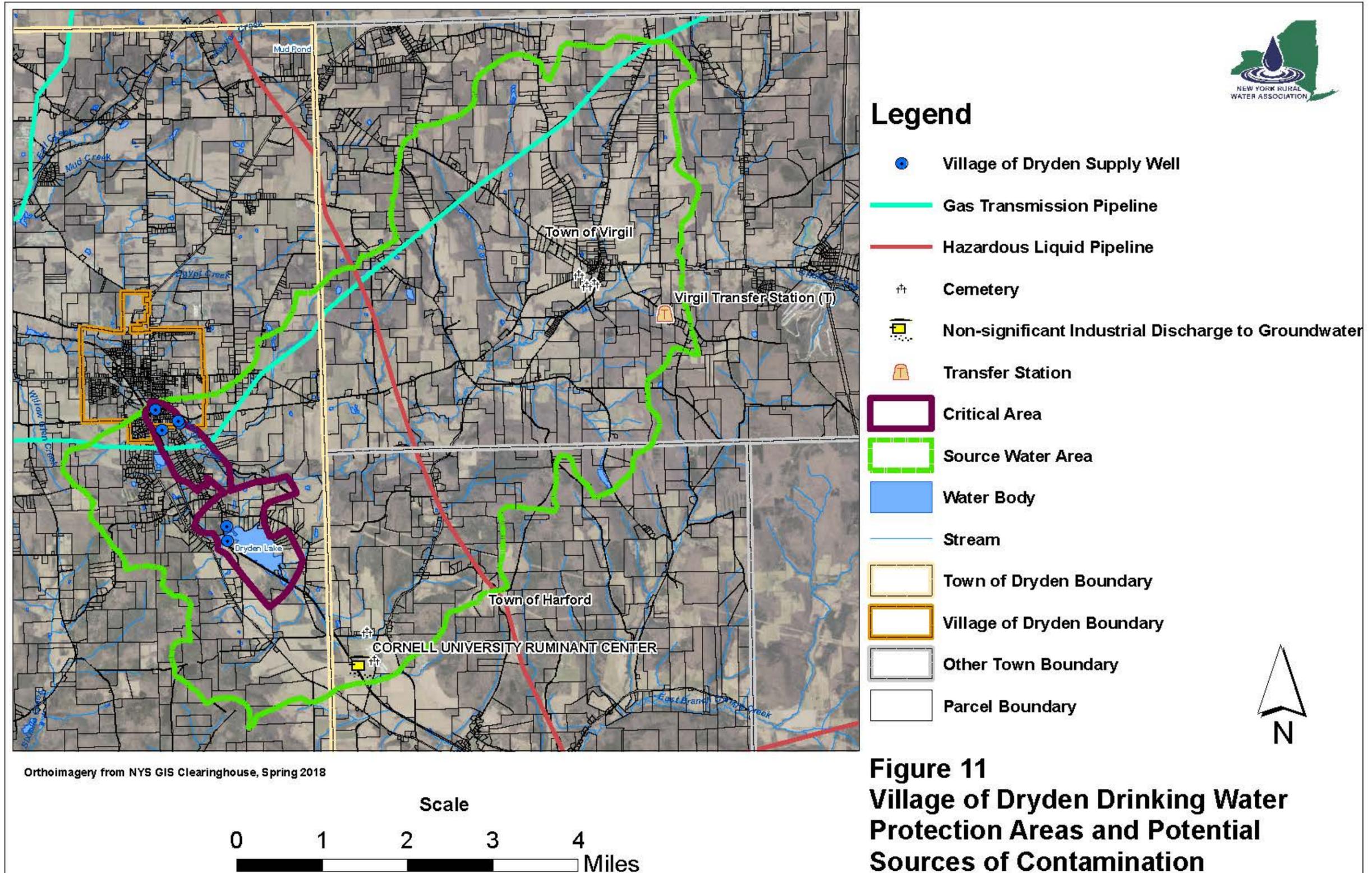
Based upon a review of available regulatory databases and real property tax assessment data, NYRWA has plotted potential sources of contamination within the Village drinking water source protection areas (Figure 11). Regulated facilities within the drinking water source protection areas includes the Town of Virgil transfer station, the wastewater disposal system at the Cornell University Ruminant Center, a natural gas pipeline operated by Eastern Gas Transmission and Storage, Inc., and a hazardous liquid pipeline operated by Buckeye Partners, LP. This latter pipeline contains unspecified non-Highly Volatile Liquids (non-HVLs). Non-HVLs can include refined and/or petroleum product (gasoline, diesel fuel, fuel oil, etc.). Below is a comprehensive inventory table of identified potential contaminant sources and relevant issues associated with each.

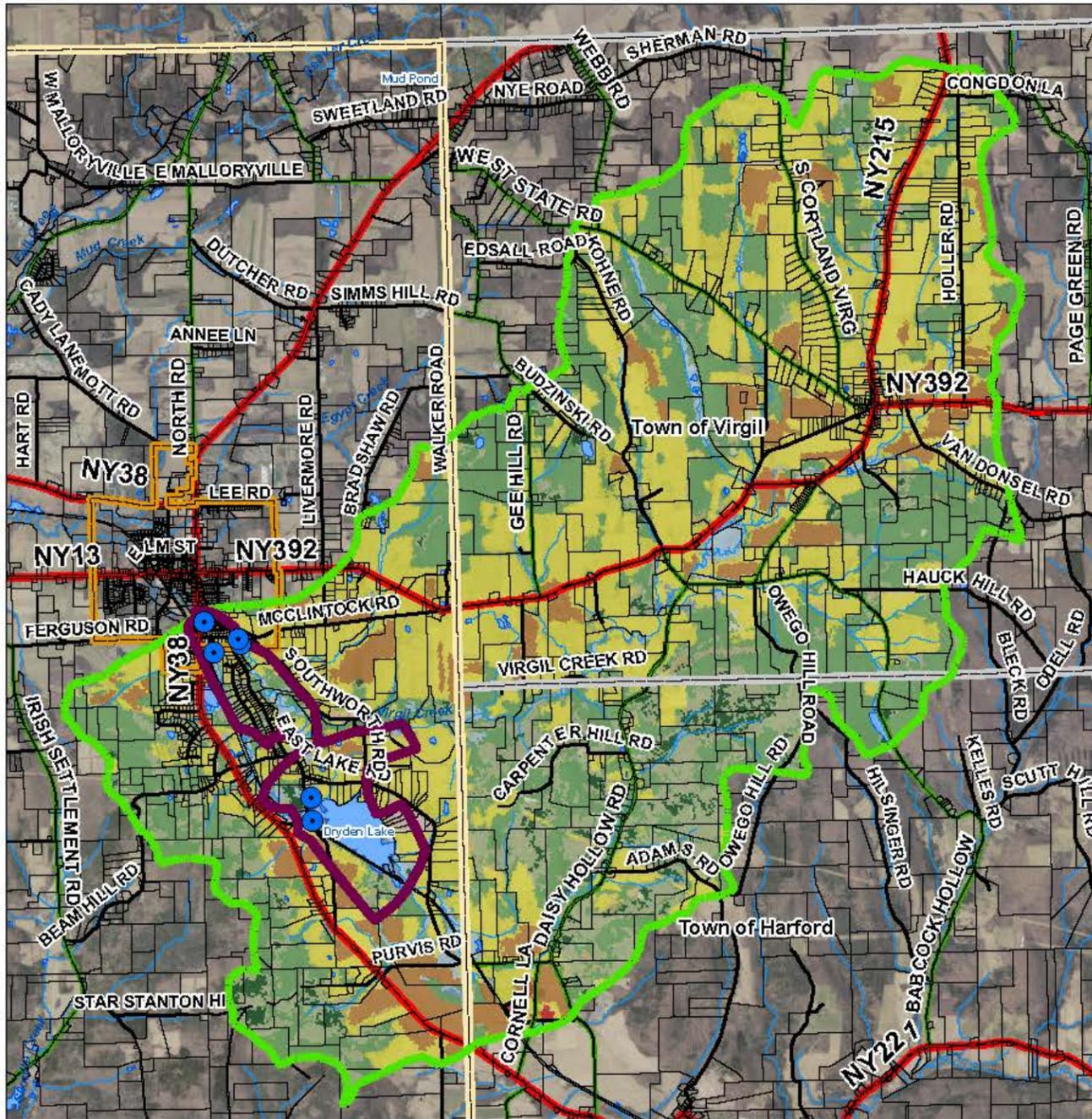
Regulated Potential Contaminant Sources Inventory Table			
Potential Source	Contaminants of Concern	Protection Area	Relevant Information
Town of Virgil transfer station	Stormwater runoff, accidental releases of petroleum or hazardous chemicals.	Source Water Area	Material is direct hauled to Cortland County Landfill.
Cornell University Ruminant Center Subsurface Wastewater Discharge	Nutrients, bacteria, viruses.	Source Water Area	Regulated as a Concentrated Animal Feeding Operation (CAFO) by New York State.
Hazardous Liquids Pipeline	Risk of fire or explosion and also releases/spills of petroleum products.	Source Water Area	
Natural Gas Pipeline	Risk of fire or explosion.	Source Water Area	

Table 5. Village of Dryden Regulated Potential Sources of Contamination

Other non-regulated land uses are identified using real property tax assessment data. A less significant potential source of contamination noted are several small cemeteries.

Figure 12 is a map of land cover within the drinking water protection areas based upon the 2016 National Land Cover Dataset (NLCD). Given its rural nature, it is not surprising that nearly 91 percent of the Village of Dryden’s drinking water protection areas consist of either agricultural land cover or forest. The developed portion of the protection areas outside of the Village are reliant upon individual septic systems for sewage disposal. However, septic systems are not considered a significant source of potential contamination for the Village supply wells based upon the confined nature of the aquifer and water quality data from the supply wells showing negligible nitrate levels.





Legend

- Village of Dryden Supply Well
- Critical Area
- Source Water Area
- Water Body
- Stream
- Parcel Boundary
- Developed, High Intensity
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrub/Scrub
- Herbaceous
- Hay/Pasture
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceous Wetlands
- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity



Orthoimagery from NYS GIS Clearinghouse, Spring 2018.
Land cover from 2016 NLCD.

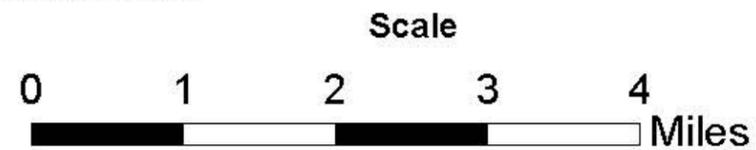


Figure 12
Village of Dryden Drinking Water
Protection Areas and Land Cover

2.4.2 Privately-Owned Community Water Systems and IWS Wells

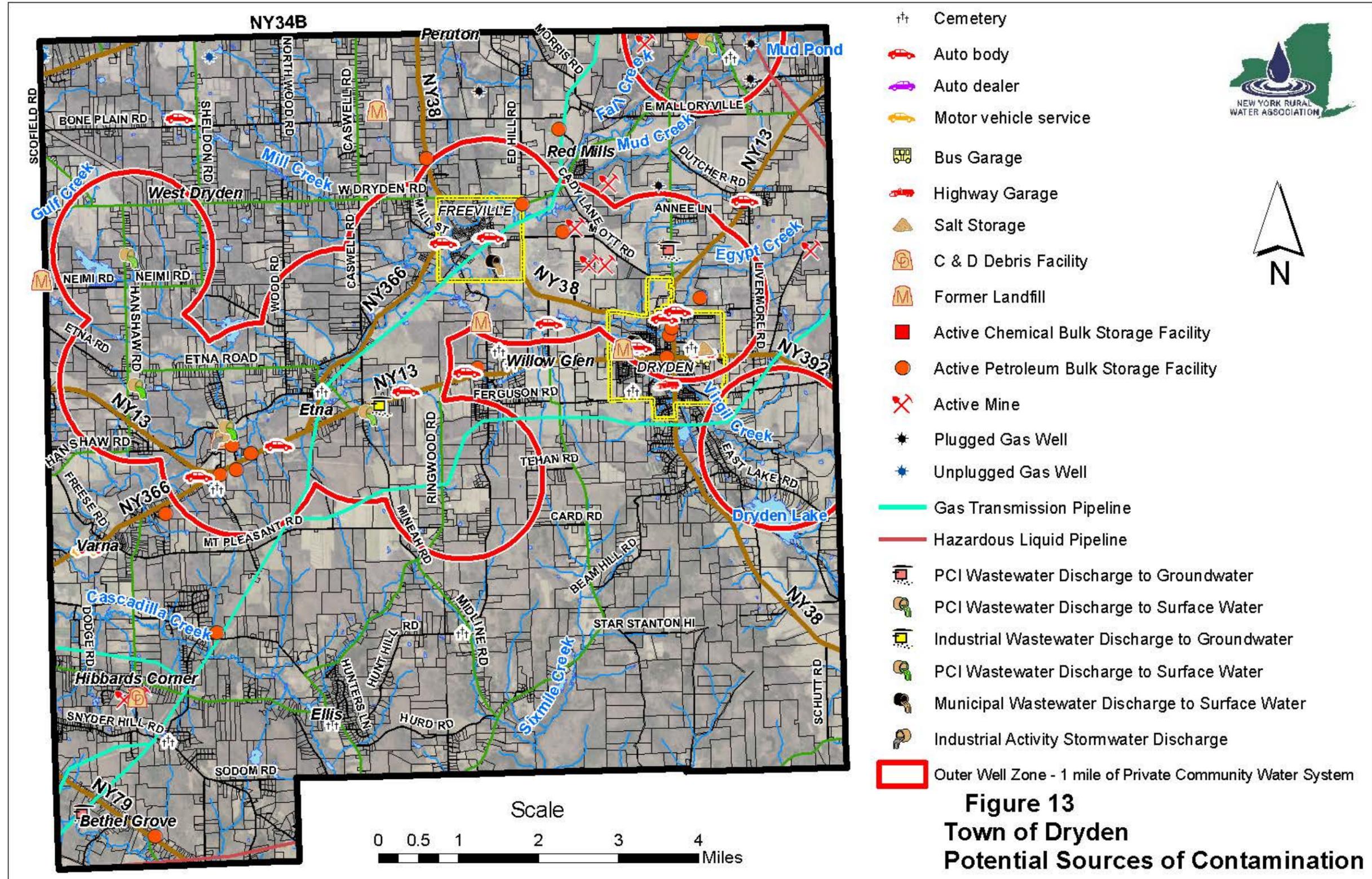
NYRWA has plotted several potential sources of contamination across the Town of Dryden on Figure 13. Many of these are government-regulated such as wastewater discharges, gas wells, mines, pipelines, etc. Table 6 below is an inventory table of identified regulated potential contaminant sources within the outer well zone of privately-owned community water systems. Other higher-risk land uses in the outer well zone were identified from real property type classification codes and other sources and include: auto body repair, auto dealers, motor vehicle service, bus and highway garages, salt storage facilities, former landfills, and cemeteries (Figure 13).

Outer Well Zone Regulated Potential Contaminant Sources Inventory Table		
Potential Source	Contaminants of Concern	Relevant Information
Chemical and Petroleum Bulk Storage Facilities	Leaks of petroleum or other substances from tanks or spills during delivery or handling.	Information on bulk storage facilities and reported spills can be found at: https://www.dec.ny.gov/chemical/8437.html
Wastewater Discharges (SPDES Permits)	Nutrients, bacteria, viruses.	Regulated by NYSDEC. Some smaller discharges to groundwater are covered under general permits. Larger facilities or those that discharge to surface water have individual permits.
Sand and Gravel Pits	Accidental leaks of petroleum or clandestine dumping.	Regulated by NYSDEC. Information on mines can be found at: https://www.dec.ny.gov/cfm/xtapps/MinedLand/search/mines/
Hazardous Liquids Pipeline	Risk of fire or explosion and also releases/spills of petroleum products.	
Natural Gas Pipeline	Risk of fire or explosion.	

Table 6. Outer Well Zone Regulated Potential Sources of Contamination

3.0 PROTECTION AND IMPLEMENTATION STRATEGIES

Dryden is the largest town in Tompkins County by land area and is the third largest town or city in terms of population. However, unlike other larger municipalities in the county, it is very dependent upon local sources of groundwater for drinking water. Protection of the local groundwater resources from potential sources of contamination is very important. Also critical is ensuring that the future sustainability of local well supplies is preserved. The recent drought in 2016 headlined this issue. Some have forecast that climate change could result in more severe summer droughts. It is important to note that confined aquifer systems such as those that predominate in Dryden are much more sensitive to the impacts of pumping. Pumping in confined aquifers impacts water levels over larger areas and water level depletion can occur if pumping wells are located too closely together.



3.1 Identify Protection Methods

Source water protection methods are a set of approaches a municipality can take to protect drinking water source protection areas. These methods are not specific to a potential contaminant source and can be utilized through regulatory and/or non-regulatory means.

3.1.1 Public Education

The aim of public education is to increase the awareness of local landowners, residents, and officials of the importance of protecting drinking water resources. Some public education has already been implemented. An online well survey was created and eventually completed by 128 individuals in Town. One of the primary objectives of this survey was to get residents to think about their individual water supply survey and subsequently educate them. Some of the results from this survey have been referenced in this DWSP2 plan.

Future public education may include:

- Informing residents and officials about the results of this plan and specific protection strategies;
- Educating homeowners on proper operation and maintenance of onsite wastewater treatment systems (see Appendix A);
- Providing information on water supply well use during droughts (see Appendix B);
- Encouraging the testing of water supply wells (see Appendix C);
- Encouraging the use of water saving devices within homes;
- Promoting natural landscaping and other lower demand vegetation;
- Educating homeowners on proper fertilizer/pesticide application rates and practices; and
- Supporting proper waste disposal (i.e. recycling).

Dissemination of information regarding septic systems, wells, etc. could be through website links, and upon issuance of certificates of occupancy or certificates of compliance, inspections of failing systems, etc.

3.1.2 Possible Extension of Public Water Supply and Sewer Infrastructure

Several of the privately-owned community water systems in Dryden are located in the New York State Route 13 corridor of the Fall Creek Aquifer (Figure 1). These systems also rely upon on-site subsurface wastewater disposal and there are several potential sources of contamination in this area (Figure 13). The Town of Dryden and Tompkins County are funding a current engineering feasibility study to determine the costs of extending of public water and sewer service approximately one-mile northeast along Route 13 from the intersection with Route 366.

Extension of the Dryden Water District in this area could replace some older, more susceptible water supplies. It is important to note that privately-owned community water systems lack the ability to directly protect their water supply except for the immediate area around the wellhead. Elimination of aging septic systems by sewers could further improve source water protection for many of these systems.

3.1.3 Aquifer Studies

The USGS study of the hydrogeology of the Lower Fall Creek aquifer initiated in fall 2020 and is scheduled to take four years to complete. The study will detail the aquifer geometry and characteristics, describe groundwater and surface-water interactions, map groundwater flow, and define groundwater quality.

Once the mapping of the aquifer in the Owasco Inlet is released by the USGS and the Lower Fall Creek report is completed, that will likely complete aquifer investigations in Dryden. In order to assist Town staff and others to evaluate the potential impacts of proposed development upon water resources, the various USGS aquifer mapping projects in Dryden could be compiled into accessible Geographic Information System (GIS) dataset(s).

3.1.4 Consideration of Site Plan Review and Approval Amendments

Due to the limited availability of groundwater in some areas of Dryden as well as the potential of the depletion of groundwater resources by competing uses (i.e. well interference), the Town may wish to consider amending its zoning regulations. One strategy that can be employed is amending site plan review and approval procedures to ensure that there is an adequate on-site supply of well water and that the proposed water withdrawal will not have an undue adverse impact to existing supply wells, surface water, wetlands, or contaminant source(s).

Water demand information could be determined by the application for site plan review or from an additional “Groundwater Data Statement” that could ask for: (1) the projected average daily water demand from on-site wells, (2) a map of existing and proposed wells at the site, including their position with respect to property lines, existing or proposed water bodies, roads, buildings, and potential contaminant sources as listed in Table 4 of this plan. If a certain amount of water is to be withdrawn (for example a projected average daily water demand of 4,000 gallons per day or more was used Danby), a “Groundwater Resources Assessment” could be required as part of the site plan checklist.

3.1.5 Prohibited Uses Amendments

Section 270-5.3 of the Town’s zoning covers town-wide prohibitions against natural gas and/or petroleum exploration and development. Additional town-wide

prohibitions could be added to this section to enhance groundwater protection. A list of possible prohibitions to protect groundwater are listed in Appendix D.

3.1.6 Enforcement of New York State Residential Code for Water Wells

New York State Residential Code subsection P2602.1.1 requires individual (residential) potable water supply (IWS) wells are located and constructed according to New York State Department of Health (DOH) standards. This includes adherence to separation distances of drinking water wells from potential sources of contamination (see Table 4). The residential code also states that wells are to be installed by a well contractor that is registered with the NYSDEC.

In the absence of Tompkins County regulations for the approval of new or replacement water wells, the Town of Dryden Code Enforcement Officers (CEOs) could play an important role in reviewing the location and construction of individual (residential) potable water supply (IWS) wells prior to issuing building permits and certificates of occupancy. The NYSDOH believes local officials have a critical role with respect to individual water supply wells and has put out a fact sheet entitled “Guidance for Code Enforcement Officials”. This is attached in Appendix E.

3.2 An Implementation Strategy Timeline Table

An implementation timeline allows the Town to organize protection efforts, develop reasonable expectations and encourage completion of the work. The following table is to be used to organize a timeline of protection and implementation efforts.

Identify Protection and Management Methods & Develop an Implementation Strategy Timeline			
Protection Method and/or Management Method	Goal	Project Leader and Partnerships Needed	Implementation Timing
Public Education	Increase the awareness of local landowners, residents, and officials of the importance of protecting and preserving drinking water resources.	Planning Department Source Water Committee NYRWA	On-going
Possible Extension of Public Water Supply and Sewer Infrastructure	Extension of public water and sewer service, decreasing reliance on aging infrastructure.	Feasibility study by T. G. Miller, P.C. and funded by Town and County.	Engineering study to be completed by end of 2021.
Aquifer Study	Improve the understanding of the hydrogeology of the lower Fall Creek valley.	USGS Tompkins County Planning	Project to be completed in fall 2024(?)
Consideration of Zoning Amendments	Prevent or minimize the depletion or deterioration of drinking water resources through amendments in zoning.	Planning Department NYRWA	?
Enforcement of New York State Residential Code for Water Wells	Review the location and construction of individual water supply (IWS) wells.	Planning Department	?

Table 7. Implementation Strategy Timeline

4.0 PLAN PROGRESSION AND MAINTENANCE

Members of the Planning Team (see Section 1.2) will have the opportunity to review this plan and provide input. Since this plan has not been funded by New York State, it is optional that the draft plan be shared with the local health department, NYSDOH, and NYSDEC. Upon completion of the review process, the final plan should then be formally adopted by the Town of Dryden.

Upon finalization of the plan, a Plan Management Team is to be designated by the Town of Dryden to implement this plan. This team will likely include Town employees on the Planning Team. Individuals on the Plan Management Team will keep other members of the Planning Team updated on the implementation of the protection/management strategies identified in this DWSP2 Plan through progress reports. NYRWA will be available to assist the Town of Dryden through the review and DWSP2 Plan implementation process. New York State recommends that a progress report be produced and shared with the Planning Team and other interested agencies/individuals no less than once a year.

Note that New York State also recommends that the DWSP2 Plan be reviewed at the same frequency that the municipality has set for updating its adopted comprehensive plan. The plan should also be amended due to any changes such as new wells, proposed land use changes, water quality trends, etc. To remain effective and relevant, the DWSP2 Plan should reflect such changes.

5.0 BIBLIOGRAPHY

Miller, T.S. and Bugliosi, E.F., 2013, Geohydrology, water quality, and simulation of groundwater flow in the stratified-drift aquifer system in Virgil Creek and Dryden Lake Valleys, Town of Dryden, Tompkins County, New York: U.S. Geological Survey Scientific Investigations Report 2013-5070, 104 p., <http://pubs.usgs.gov/sir/2013/5070/>.

Miller, T.S. and Karig, D.E., 2010, Geohydrology of the stratified-drift aquifer system in the lower Sixmile Creek and Willseyville Creek trough, Tompkins County, New York: U.S. Geological Survey Scientific Investigations Report 2010-5230, 54 p.

Miller, T.S., 2000, Unconsolidated Aquifers in Tompkins County, New York: U.S. Geological Survey Water-Resources Investigations Report 00-4211.

Appendix A. Septic System Operation and Maintenance Brochure

Maintain Your System

Regularly pump-out your septic tank when needed.

Keep a record of pumping, inspections, maintenance and repairs.

Map out septic tank and other system components. Either have a map or locate components with permanent stakes. This is useful for accessing the system and will prevent damaging system components when doing home maintenance or yard work.

Don't park or drive heavy vehicles or equipment over the septic system or any of its components.

Don't build structures, such as decks, patios or swimming pools, that would cover the absorption field or limit access to the septic tank and distribution box.

Don't flush or use strong chemicals and bacteria-destroying products, such as drain cleaners, solvents, paint, paint thinners, floor cleaners, sink cleaners, motor oil, antifreeze, pesticides, and photo chemicals. These may disrupt septic tank or absorption system operation. Household bleach, disinfectants, cleansers, antibacterial soaps, when used in normal household applications should not affect system operations.

Don't flush materials that don't easily degrade, such as paper towels, cotton swabs, personal hygiene products, condoms, medications, disposable diapers, coffee grounds, cat litter, cooking fats/oils, facial tissues, dental floss, cigarette butts, plastics, grease or bones.

Avoid septic tank additives. A septic tank that is properly sized and maintained will adequately manage household wastewater without the use of additives.

Avoid garbage disposals or grinders because these substantially increase the accumulation

of solids in the septic tank and in the absorption field. If they are used, the septic tank size should be increased and pumped-out more often.

Direct water treatment system discharges to a separate soil absorption system, if possible, to minimize discharges to the septic system. However, as long as the system is well maintained and can accommodate the additional flow, water treatment system discharges can be directed to the septic tank in many cases.

Direct drainage away from the septic system from roof, cellar/footing (sump pump) and surface water run-off.

Plant grass and other shallow-rooted plants over the absorption field. Keep trees and long-rooted plants and shrubs away from the immediate area of the absorption area. Roots can grow into the pipes and clog the system.

Conserve water. Check for defective toilet tank valves, repair leaky fixtures, and install appliances and fixtures that use less water and avoid wasteful practices.

Regularly inspect and maintain any effluent pumps and alarms that may be part of your septic system.

Find Out More

Contact the New York State Department of Health
Ph: (518) 402-7650, E-mail: bpwsp@health.ny.gov
health.ny.gov/DrinkingWater

Contact Your Local Health Department
www.health.ny.gov/EnvironmentalContacts



Department
of Health

Septic System

Operation and Maintenance

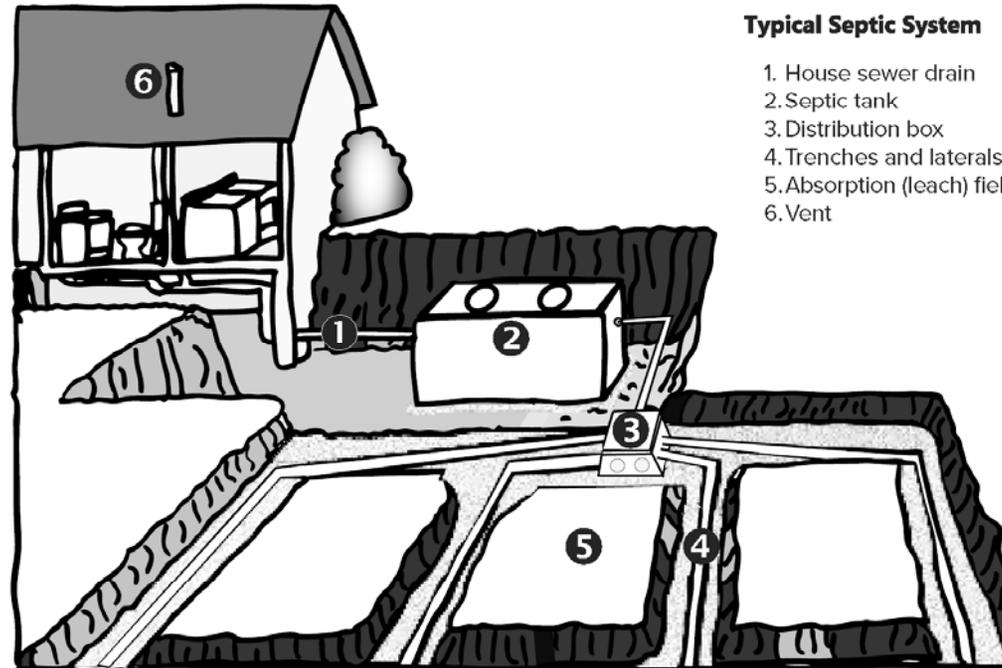


A septic system will serve a home for a long time if it is properly located, designed, constructed and maintained. However, even the best designed and installed septic system will eventually fail without periodic maintenance. This guide briefly describes septic system components and how they should be maintained.

Septic System Components

A septic system, also called an onsite wastewater treatment system (OWTS), is made up of a **house sewer drain**, **septic tank**, **distribution box** and **soil absorption (leach) field** (see *Typical Septic System diagram, right*).

1. **The house sewer drain** collects all the discharge from home fixtures, such as toilets, sinks, showers and laundry and connects to the septic tank.
2. **The septic tank** collects all the discharges from household plumbing and provides the needed time for wastes to settle or float. The heavy solids settle to the bottom of the tank where they are broken down by bacteria to form sludge. The lighter solids, fats and grease, partially decompose and rise to the surface to form a layer of scum. This process allows the partially treated wastewater to be released to the absorption field.
3. **The distribution box** evenly distributes wastewater from the septic tank to pipes in the trenches of the absorption field. It is important that each trench receives an equal amount of flow to prevent overloading to one part of the absorption field.
4. **Trenches** receive partially treated sewage.
5. **The absorption (leach) field** is a system of trenches and distribution pipes where wastewater is biologically treated by the surrounding soil. The system is partially filled with washed gravel, stone or a gravelless product. The absorption field must be properly sized, constructed and maintained to assure satisfactory operation and long life.
6. **The vent** permits gases that build up in the plumbing to exit the system.



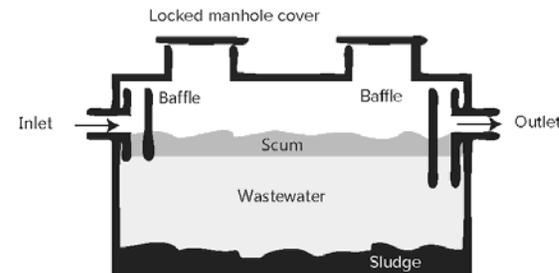
Typical Septic System

1. House sewer drain
2. Septic tank
3. Distribution box
4. Trenches and laterals
5. Absorption (leach) field
6. Vent

Septic Tank Maintenance

A septic tank should be pumped out every two to three years.

A septage waste transporter (septic tank pumper) that is licensed by the New York State Department of Environmental Conservation can inspect, measure tank layers and pump out the tank when necessary.



Typical Septic Tank

CAUTION! Never enter a septic tank because it contains toxic gases that can be deadly.

Appendix B. Private Water Well Use during Drought Conditions Guidance



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55 Brown Road
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ENVIRONMENTAL HEALTH DIVISION
www.tompkinscountyny.gov/health/eh

Ph: (607) 274-6688
Fx: (607) 274-6695

PRIVATE WATER WELL USE DURING DROUGHT CONDITIONS GUIDANCE

Some private wells run dry every summer, while others, which may be right next-door, flow without a problem even during a drought. Geographical or physical conditions of the soil or rock and well construction may cause these differences.

Groundwater levels all across Tomkins County are low this year due to a very dry winter, spring and summer. If weather trends persist we anticipate an increase in the number of private wells that will run dry this year. This guidance has been prepared to help people cope with the situation.

Do I have a Problem?

If you hear your pump going on more frequently than normal or experience water outages, or if air bubbles come out of your faucet, you well may be having trouble keeping up with your demand for water. If you have a well in this situation, a thermal protection control device should be considered to avoid damaging your well pump and help control the flow of water into your pressure tank.

Where is My Well?

Where is it? How deep is it? These are some basic questions. If you do not know the answers, call a registered well driller (see *Certified Well Driller list*). The well driller who installed your well may also be a useful source of information. The DEC has well logs available for all wells drilled starting in 2000.

Why Conserve Water?

Cutting back on water use by refraining from outdoor use or doing laundry and limiting toilet flushing and bathing can significantly reduce your demand for water. Timing water use to spread out your water demand over the entire day may also help. See the attached tips for reducing water demands and lessening water demand.

How Do I Increase My Available Water?

A NYSDEC registered plumber or well driller can inspect your well and may be able to lower the pump. This may increase the useable storage in the well and increase the extent of the aquifer from which the well can get water if the well is already deep. Deepening your well is another possibility.

Increasing the amount of water storage through the installation of an atmospheric storage tank and/or transfer pump by a registered plumber or well driller may help. Water in storage will be available for use as needed, for longer periods. This allows well water to flow into the well (recover) for a longer period of time before recharging the tank. *(Please reference the NYSDOH Individual Water Supply Wells Water Storage Fact Sheet #2 for details)*

What Happens if I Run Out of Water?

If the groundwater level drops below the bottom of your well you are out of water. Deepening your well or drilling a new well may be a solution. If that is not feasible, it may be possible to connect a tank to your home and have water delivered by a bulk water hauler (see NYSDOH Certified Bulk Water Hauler list), although this may require the installation of an atmospheric storage tank and transfer pump.

What About Safety?

Any time work is done on your well, or you add water storage, or change delivery, your system should be disinfected to kill any bacteria that may have entered the system during the work procedure. *(Shock disinfection of water supply systems)* Also private well owners should test their water annually for bacteria and other indicators, and whenever there is an evident change in quality contact our department for advice. *(The local NYS certified lab list can be found here)*

For smaller volumes of water, details of Emergency Disinfection of Drinking Water Supplies can be found here <https://www.epa.gov/ground-water-and-drinking-water/emergency-disinfection-drinking-water>

When Will Things Get Better?

This is largely governed by precipitation and is thus unpredictable. However, if conditions have not improved, relief can be expected normally around mid-October when evaporation and transpiration by plants declines.

Things to Remember

Do not fill your well from other water sources. The water will disperse into the aquifer. Your well is not a storage tank. *(Click for details)*

Ideas for optimizing your water consumption: <https://www.epa.gov/watersense>

When in doubt, utilize local and state resources for information.

Appendix C. Test Your Well: Protect Your Family's Water Brochure

Tips to Protect Your Water

- Test your well water at least once a year for bacteria and for other contaminants every 3-5 years.
- Test your water for *E. coli* and coliform bacteria after you disinfect and flush your well, or perform maintenance on your system to make sure problems are addressed.
- Regularly check and maintain the well, system components and area surrounding the well.
- Test your water if you notice changes in how your water looks, smells or tastes, after floods, changes in land use or concerns about local contaminants.
- If you suspect your well could be contaminated by gasoline, heating oil or chemicals, contact your health department and the DEC Spill Hotline at (800) 457-7362.
- Keep records of maintenance activities and water testing.
- Contact your health department for advice on maintaining, testing, disinfecting and flushing your well.
- Take steps to get connected to a public water system, if you have the opportunity. Public water is the best option for household water because it is regularly monitored and managed by a certified water operator.

Find your area health department:
www.health.ny.gov/EnvironmentalContacts

www.health.ny.gov/PrivateWells
 (518) 402-7650
bpwsp@health.ny.gov

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Department
of Health

3/18

Test Your Well Protect Your Family's Water

Tips for People on Private Wells



Take steps to make sure the water from your private well is suitable for drinking, preparing food and all household uses.

Germs and chemicals can enter your drinking water from runoff and natural changes in the water that serves your well.

The use of contaminated water for drinking, preparing food and making ice can make you, your family and your pets sick. Babies, children, pregnant women, older adults and people with health conditions are most at risk of health effects from consuming contaminated water.

Regularly Test Your Water

Testing your drinking water is the only way to make sure that your water remains suitable for household uses. Test your water at the tap at least once a year for bacteria and every 3-5 years for the other contaminants listed to the right. The best time to test your water is in the late spring or early summer.

Your lab will provide instructions and bottles. Find a certified lab at www.wadsworth.org/labcert/elap/comm.html.

Also Consider Testing If ...

- You notice changes in how your water looks, smells or tastes.
- There are changes in your household/family, such as pregnancy, new babies or changes in someone's overall health.
- You or your health care provider suspect your drinking water could be causing symptoms such as diarrhea or vomiting.
- You have made repairs to your well, pipes or home structure or have changed your drinking water system.
- You notice changes in land use, such as construction or farming, that could cause runoff to enter your well.
- You have concerns about local contaminants, such as radon or those from nearby industrial or waste sites.
- Your well was recently flooded or damaged by extreme weather.
- The well runs dry or the amount of water flowing from your fixtures changes.

Contact your area health department for advice. Look up your health department by county at www.health.ny.gov/EnvironmentalContacts.



Test Your Well EACH YEAR for

E. coli & coliform bacteria- Indicate fecal contamination that can cause symptoms such as diarrhea and vomiting

Test Your Well EVERY 3 - 5 YEARS for

Lead- harmful to many organs and systems in the body and most harmful to developing babies and young children

Nitrate & Nitrite- most harmful to babies; associated with infant blood problems

Arsenic- long-term exposure is associated with nerve and liver damage, cancer, high blood pressure and damage to blood vessels of the heart and brain

Sodium- concern for individuals on restricted sodium diets due to high blood pressure or other medical issues

Iron & Manganese- cause rust or black staining of fixtures or clothes

Turbidity- (cloudy water) interferes with chlorine and UV-light disinfection

pH- causes lead and copper pipe corrosion and metallic-bitter taste

Hardness- causes mineral and soap deposits on fixtures; reduces detergent efficiency

Alkalinity- interferes with chlorine disinfection and causes metallic-bitter taste

Your water could come from a private well if...

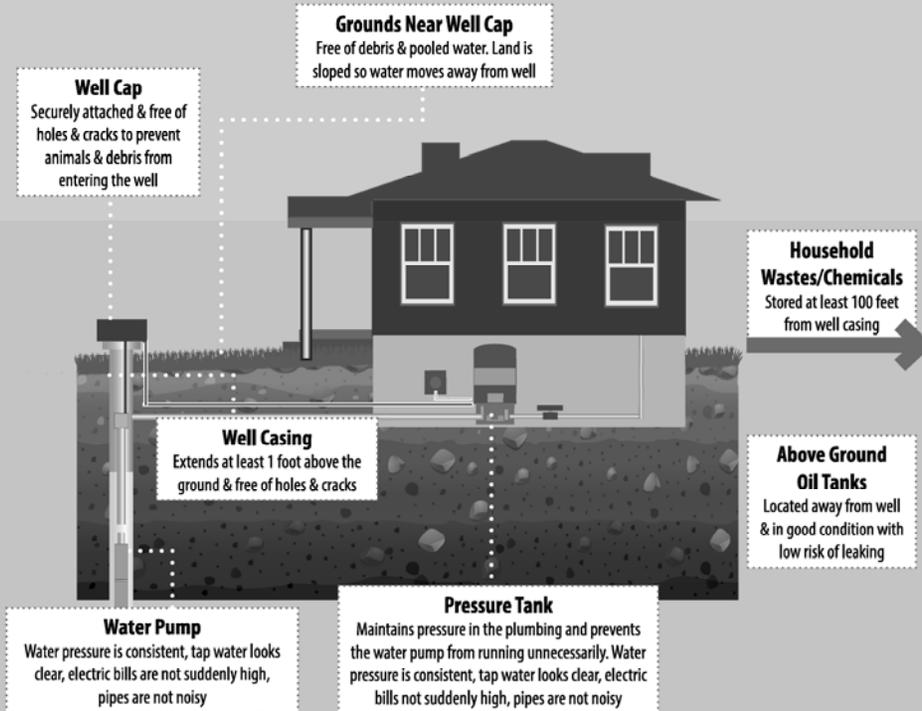
- You do not receive a water bill.
- You live in a rural area.
- You have a septic system.
- You have a water pump in your home for your drinking water system.

Questions? Contact Your Area Health Department
www.health.ny.gov/EnvironmentalContacts

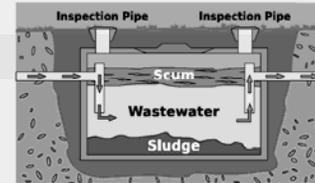
Inspect & Maintain Your Well and Water System

Have a well contractor inspect your well at least once a year to stay ahead of maintenance issues. Regular inspections help prevent contaminants from getting into your tap water from a poorly maintained well. The NYS Department of Environmental Conservation (DEC) has a list of registered well contractors at www.dec.ny.gov/lands/33317.html.

Use this diagram to keep an eye out for problems. If you suspect issues and need help, contact a professional. Stop using your tap water for drinking, preparing food and making ice, and switch to bottled water until your water is tested and the problem is addressed.



Inspect & Pump Out Your Septic System



Have a DEC-permitted waste transporter inspect and pump out your septic system every 2 to 3 years to avoid potential well contamination from a failing septic system. Learn more at [Septic System Operation and Maintenance](http://www.health.ny.gov/publications/3208) www.health.ny.gov/publications/3208.

Maintain Water Treatment Equipment



If you have water treatment systems, follow manufacturer recommendations for maintenance and testing and work with a water treatment professional to develop a plan to evaluate and maintain your system. Systems that are not regularly maintained can result in failure of water treatment and loss of water pressure.

Avoid Electric Shock Risk



- Before making any repairs:
- Shut off power to the pump and water system.
 - Examine for broken wire insulation or missing wire nuts and repair as necessary.
 - Wear waterproof, rubber soled shoes or boots.

This diagram shows a drilled well. If you have a dug well, your well cap and casing may look different. Learn more about [Standards for Water Wells](http://www.health.ny.gov/regulations/nycrr/title_10/part_5/appendix_5b.htm) at www.health.ny.gov/regulations/nycrr/title_10/part_5/appendix_5b.htm.

Contaminants in Your Water?

Stop using your water and use bottled water for drinking, preparing food or making ice if water tests show contaminants in your well water or if you suspect your well could be contaminated.

Follow these steps from [Restoring and Testing Your Private Well](http://www.health.ny.gov/PrivateWells) (www.health.ny.gov/PrivateWells):

- Check the well and area around the well for damage.
- Repair and flush your well.
- Disinfect your well water to address biological contamination.
- Test your water to assure suitable quality for all household uses.
- Contact your area health department for help if you need it. Look them up at www.health.ny.gov/EnvironmentalContacts.

If you suspect your well could be contaminated by gasoline, heating oil or chemicals, stop using your water and immediately contact your area health department and the DEC Spill Hotline at (800) 457-7362.

Resume using your water after contamination is addressed and water tests confirm your water is suitable for household uses.



Appendix D. List of Potential Additional Town-Wide Prohibitions to Protect Groundwater

Possible Land Uses/Activities to Add to Section 270-5.3 of Dryden's Zoning:

1. Any use or activity that involves the on-site disposal of solid waste, medical waste, petroleum, radioactive material, hazardous or toxic substances, hazardous waste, process wastes, including wastewater (except for the disposal of sewage through an on-site wastewater treatment system, or the agricultural use of animal manure, associated bedding material, and food processing wastes where such wastes are applied at or below agronomic rates).
2. Any solid waste management facility except for land application or composting facilities permitted by NYSDEC for agricultural use within an agricultural district created pursuant to New York State Agriculture and Markets Law.
3. Surface land application of septage, sewage, or sludge except where permitted by NYSDEC for agricultural use within an agricultural district created pursuant to New York State Agriculture and Markets Law.
4. Construction of a concentrated animal feeding operation in portions of the Town located outside of a local agricultural district created pursuant to New York State Agriculture and Markets Law.
5. A facility that receives hazardous or toxic substances, hazardous waste, medical waste, or radioactive material generated off-site for treatment, storage, or disposal.
6. Bulk stockpiling or storage of coal, cinders, deicing compounds, hazardous substances, hazardous wastes, toxic substances, fertilizers, herbicides and/or pesticides except in packaging for individual use or resale or in structures designed to prevent contact with precipitation and constructed on low permeability pads designed to control seepage and runoff.
7. Drilling of wells to be used for: solution salt mining; open-loop geothermal heating and cooling systems; or disposal of wastes including brine, natural gas exploration and/petroleum production waste, process waste, hazardous wastes, radioactive material, and wastewater.
8. Application of production brine from an oil or gas well source or a liquefied petroleum gas (LPG) storage facility onto roads or other land surfaces.
9. Drilling, development, and/or construction of sources of water for bottled water or bulk water facilities except for the collection of spring water without the use or assistance of an external force.

Appendix E. NYSDOH Fact Sheet Guidance for Code Enforcement Officials



Department of Health

NEW YORK STATE DEPARTMENT OF HEALTH
Bureau of Water Supply Protection

INDIVIDUAL WATER SUPPLY WELLS - FACT SHEET #6
GUIDANCE FOR CODE ENFORCEMENT OFFICIALS

Code Enforcement Officials (CEO) provide a critical role in reviewing the location and construction of individual (residential) potable water supply (IWS) wells prior to issuing building permits and certificates of occupancy. The New York State Residential Code subsection P2602.1.1 requires IWS wells be located and constructed according to New York State Department of Health (DOH) 10NYCRR Appendix 5-B standards to reduce the risk of contamination and maintain a long term water supply for homeowners. Improperly constructed or located wells can pose a significant risk for contamination of a well.

COMPLIANCE WITH WATER WELL CONSTRUCTION REGULATIONS AND WELL CONTRACTOR REQUIREMENTS

New and replacement IWS are required to be in compliance with the NYS Residential Code (which references Appendix 5-B “Standards for Water Wells”), installed by a certified NYS Department of Environmental Conservation (DEC) registered water well contractor (driller) and have groundwater as the water source. Some counties may have their own requirement for approvals of new and replacement wells. Check with the local health department (LHD) using the contact information available at:
www.health.ny.gov/environmental/water/drinking/doh_pub_contacts_map.htm

Residential Code: Subsection P2602.1.1: “Individual water supplies. Individual water supplies (private wells) shall be installed by a well driller registered with the DEC and be in compliance with the provisions of Appendix 5-B of the New York State Department of Health regulations (10NYCRR Appendix 5-B).”

Well Construction: Appendix 5-B, “Standards for Water Wells”: This Appendix serves as the reference standard for construction of all new and replacement IWS. **Approvals for deviations (e.g., “specific waivers”)** from the standards can only be granted by the LHD having jurisdiction. Appendix 5-B can be found at:
www.health.state.ny.us/nysdoh/water/part5/appendix5b.htm.

Water Well Contractor Registration: Environmental Conservation Law §15-1525: This law requires persons engaged in the business of water well contracting to be registered with the DEC (see below). Water well contracting includes any excavation for the purpose of obtaining groundwater, which includes drilled wells, dug wells, springs, “driven points” and shore wells. **The water well contracting supervisor needs to be “certified”** (i.e. passed an exam by the National Ground Water Association) and onsite during water well construction activities.

KEY ITEMS TO CHECK

It is recommended that the following key items be checked prior to issuing a building permit or certificate of occupancy. A checklist CEOs may use that includes the following items is attached.

Well Contractor Requirements: The following DEC Well Contractor Law requirements should be verified:

1. **DEC registration:** Check that the well contractor is presently *registered* with DEC. A list of registered well contractors can be found at www.dec.ny.gov/cfm/xtapps/WaterWell/index.cfm
2. **Well Completion Report:** This report is required to be submitted by the water well contractor to DEC and the water well owner. CEOs, however, have authority to ask for a copy (e.g., from the well owner) to review before approving the well. (These reports may not be available until the well has been paid for.)

Contact the DEC Water Well Program at 877-472-2619 or 518-402-8291 for questions on water well contractor registration or check online at www.dec.ny.gov/lands/33317.html. Well contractors that are not registered can be referred to DEC.

Well Location and Separation Distances: Appendix 5-B requires that wells be located an appropriate distance from known sources of contamination and not subject to flooding or surface water contamination. The table below lists required separation distances from wells to commonly encountered contaminant sources. For a full list of separation distances see Table 1 in Appendix 5-B. Proposed separation distances need to meet Appendix 5-B requirements and should be verified. Deviations from these separation distances need approval from the LHD.

Contaminant Source	Distance (Feet)*
Land application or storage of manure	200
Seepage pit	150
Absorption (leach or tile) field or bed	100
Septic tank, enhanced treatment unit, watertight effluent line to distribution box	50
Sanitary (public) or combined sewer	50
Stream, lake, watercourse, drainage ditch, or wetland	25

*Note: Separation distances from contaminant sources need to be significantly increased if the contaminant source is located upgradient from a well or if aquifer water enters the well (i.e., at the bottom of the casing) at less than 50-feet below grade. Refer to Table 1 of Appendix 5-B or contact your LHD for questions on this Note.

ADDITIONAL WATER WELL CONSTRUCTION CONSIDERATIONS

Well Construction: The following details should be verified during site inspection and/or upon review of the NYSDEC Well Completion Report:

1. **Well depth** and **well casing length.** The well depth needs to be shown. The casing needs to extend at least 1-foot above grade and 19-feet below grade.
2. **Well cap** tightly secured to the casing; also watertight and vermin-proof. Split caps are not allowed.
3. **Grout,** if needed (not necessarily needed in sand or gravel; see Table 2, Appendix 5-B), is placed to fill the annular space around the casing to establish a watertight seal.
4. **Grading** of the area surrounding the well helps to eliminate ponding and direct surface water away from the top of the well casing; the well also needs to be located in an area not subject to flooding.
5. **Well yield** (if determined by the well contractor) is recorded before the well is placed into use.
6. **Pump** (if installed by the well contractor) or **well screen** (if needed) are recorded.

Well Points, Dug Wells, Springs and Shore Wells: A drilled well, located and constructed according to these criteria, should routinely be the water supply option selected. Well points, dug wells, springs and shore wells may need approval by the LHD. (Dug wells constructed with stone or brick shoring and single pipe driven point wells under suction are not in compliance with Appendix 5-B and should be avoided.) For more information on these types of sources refer to NYS DOH Fact Sheet #5, "Susceptible Water Sources."

Abandoned Wells: It is recommended to check the site for previously constructed wells that have been abandoned due to inadequate production. These abandoned wells should be properly decommissioned as described in Fact Sheet #4, "Decommissioning Abandoned Wells."

IWS Fact Sheets: www.health.ny.gov/environmental/water/drinking/regulations/fact_sheets/

For copies and questions concerning this Fact Sheet, Appendix 5-B, or other Fact Sheets:

Contact Your Local Health Department Official: www.health.ny.gov/environmental/water/drinking/doh_pub_contacts_map.htm	or	Residential Sanitation Section Bureau of Water Supply Protection New York State Department of Health (518) 402-7650 or FAX (518) 402-7599 E-mail: bpwsp@health.ny.gov
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CHECKLIST

Attachment to NYSDOH Fact Sheet #6: “Guidance for Code Enforcement Officials”

This checklist is produced by the New York State Department of Health (NYSDOH) for CEOs who wish to use it when inspecting an individual water supply and issuing a building permit or a certificate of occupancy. This checklist is for personal use and does not need to be submitted to any agency. The regulations governing water well standards for individual water supply are the Residential Code (Subsection P2602.1) and NYS DOH Appendix 5-B. A complete version of Appendix 5-B can be found at www.health.ny.gov/regulations/nycrr/title_10/part_5/appendix_5b.htm. Fact Sheet #6 should also be reviewed when using this checklist.

Name of well/property owner:	
Address:	
Phone:	Date of Inspection:
GPS or approx. well location:	
Local or Town Permit Number:	

MANDATORY FOR COMPLIANCE WITH THE RESIDENTIAL BUILDING CODE:

The following are key items CEOs should verify regarding the contractor and water well location/construction prior to issuing a building permit or certificate of occupancy:

- NYS Department of Environmental Conservation (DEC) Registered Well**
Contractor: A current registration sticker, like that shown, is to be located on the left front fender of the drill rig. The style and/or color of this sample sticker may change on a yearly basis. Contact the DEC Water Well Driller Program at 877-472-2619 for more information on the DEC registration program.

- Well Completion Report:** The well completion report needs to be submitted to the DEC and the well owner. Details on the report need to include: well depth, casing length, depth and type of grout, screen type (if applicable), well yield (if performed by well contractor), pump type (if installed by well contractor), etc. See reverse side for an example of a well completion report and where each item can be found. CEOs may request a copy of the report to review from the well owner.

- Well Location and Separation Distances:** The separation distances from the water well to potential contaminant sources need to be adhered to. The table below is a list of required separation distances from wells to the most commonly encountered contaminant sources. Refer to Appendix 5-B for a full list of separation distances. In addition, the well should not be prone to flooding or ponding of surface water.



Contaminant Source	Distance (Feet)
Land application or storage of manure	200
Seepage pit	150
Absorption (leach or tile) field or bed	100
Septic tank, enhanced treatment unit, watertight effluent line to distribution box	50
Sanitary (public) or combined sewer	50
Stream, lake, watercourse, drainage ditch, or wetland	25

