Spring water and Wellhead Protection Plan

Town of Kortright, New York


















Prepared by the Town of Kortright & Delaware County Planning Department
With Planit Main Street, Inc.

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PLANIT MAIN STREET™

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This *Spring Water and Wellhead Protection Plan* builds upon a *Source-Water Protection Plan* completed by Geo-Environmental Management Solutions, LLC (GEMS). A total of $7,500 in New York State Department of State funds was allocated to this *Spring Water and Wellhead Protection Plan* prepared by Planit Main Street, Inc.

1.0 INTRODUCTION

According to the U.S. Bureau of the Census, the Town of Kortright had an estimated year-round population of 1,504 persons in 2008. The Town of Kortright's water supply system provides potable water to the hamlet of Bloomville. This water supply system has a capacity of 46,000 gallons per day (gpd) and provides 23,000 gpd to 220 residents, civic groups and local businesses. The preeminent need of the water district is thus not to produce or store more water, but rather to protect the quality of its existing source-waters.

The Town's water supply consists of three (3) springs, an 81,000-gallon water storage tank, two (2) wells and two (2) adjacent well houses for sanitary system maintenance. However, Spring No. 3 was taken offline since it was at risk of being under the influence of surface water. The springs and water tank lay upslope of the well field and well houses. The springs are situated northwest of West Harpersfield Road (CR 33); the well houses abut West Harpersfield Road.

The *springs* are located along the eastern margin of Scotch Hill and situated between Scotch Hill Road and West Harpersfield Road. The type of aquifer that feeds the springs is known as a *valley-fill aquifer* that is recharged from upland runoff. The springs are located in a wooded area. Agricultural, meadows and residential land uses lie upslope. Potential sources of contamination to the *springs* include upland runoff from agricultural, forestry and residential activities.

The Town's *wells* and *well houses* are situated between West Harpersfield Road and Wright Brook. The wells reside in sand and gravel deposits with a depth of 75-100 feet. The region upslope from the well fields consist of agricultural and rural residential land uses. *Manure spreading, with pathogen and nutrient loss, is a potential source of contamination.*

In 2008, the Town Board retained the services of Geo-Environmental Management Solutions, LLC (GEMS) to conduct field research of its water sources and to develop a *Source-Water Protection Plan (SWPP)*. The SWPP studied the existing drinking water sources, delineated water source/recharge areas for drinking water and recommended techniques that could be employed to develop a source-water protection area. The GEMS SWPP defined the primary and secondary protection areas for the Town's water supplies and provided general recommendations for future resource planning (see Map No. 1). This *Spring Water and Wellhead Protection Plan* builds upon the GEMS SWPP recommendations and is intended provide a framework through which the Town Board can take proactive measures to protect its water supplies through a variety of educational and regulatory programs.

What follows is a brief summary of Geo-Environmental Management Solutions, LLC (GEMS) *Source-Water Protection Plan* findings. These findings provide the basis for subsequent land use policy recommendations for this *Spring Water and Wellhead Protection Plan.*

Above (top to bottom): United Methodist Church at 35 Church Street; Town of Kortright Town Hall on NYS Route 10; and offices for local sanitation company. The hamlet of Bloomville lies down slope of the Town's source-waters (e.g. springs that are situated between of Scotch Hill Road and West Harpersfield Road and wells that situated between West Harpersfield Road and Wright Brook).

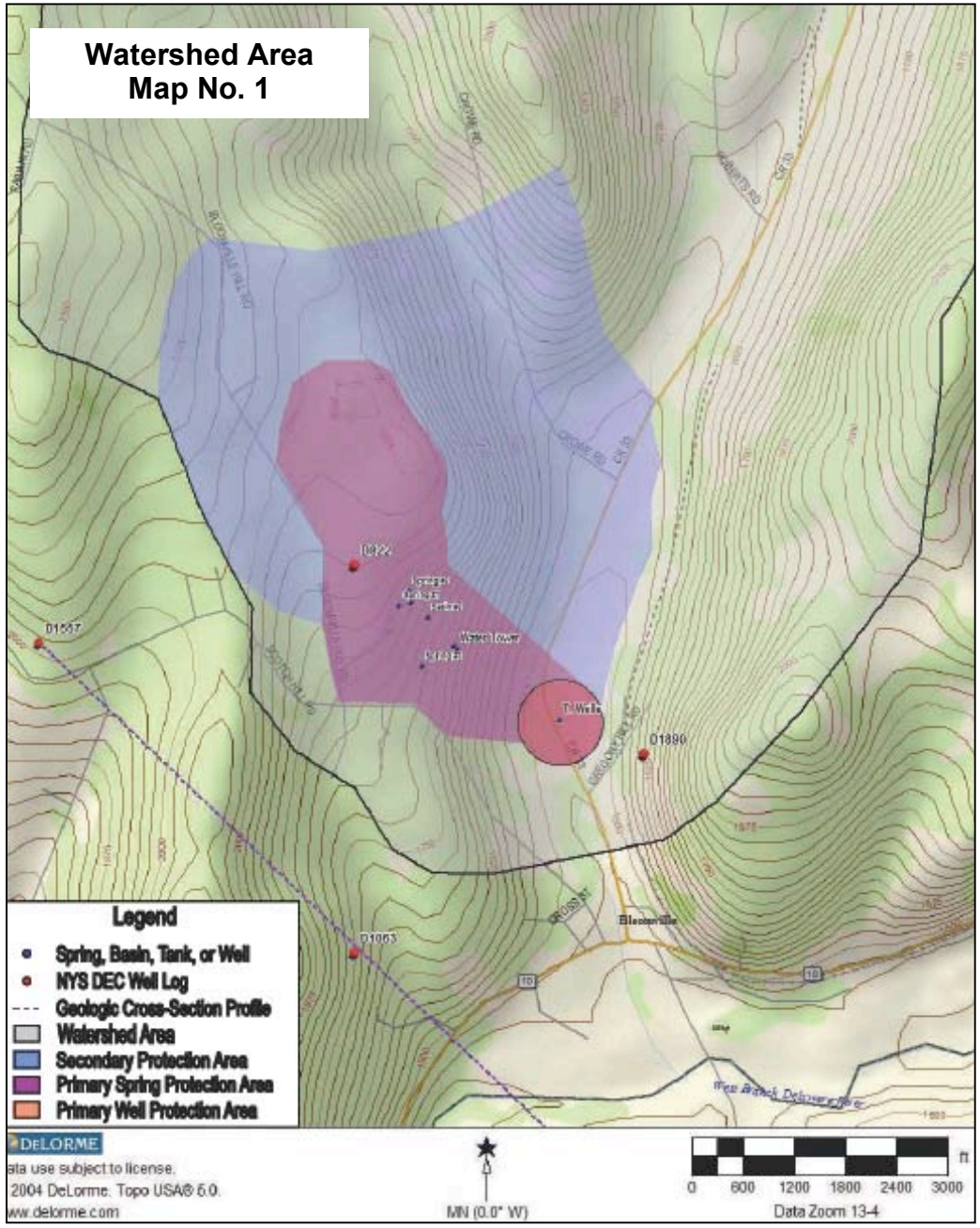
1.1 Town of Kortright Springs

The Town's spring water is drawn from a cluster of three springs along the eastern margin of Scotch Hill between Scotch Hill Road and West Harpersfield Road" (see Map No. 1). These springs are located within a glacial valley-fill aquifer that lies within a narrow drainage basin.

According the to the GEMS SWPP, "conditions at the spring locations suggest that the aquifer recharge is a delicate interaction among bedrock fracture concentration (horizontal and lateral), soil depth, and slope gradient influencing spring location, discharge and seasonal variability. Wetlands and persistently wet areas in the higher elevations recharge the fractured bedrock aquifers below, creating *springs* at locations where poorly drained soils prohibit the downward infiltration of groundwater."

"These springs have shown no signs of contamination during historic water sampling events. However, Spring No. 3 is no longer in use since it was at risk of contamination and Spring No. 2 catches water from a seep that may be under the influence of infiltrating surface water." (GEMS SWPP 2009)

Springs are susceptible to contamination because the water feeding them typically flows through the ground for only a short distance, limiting the amount of natural filtering that can occur. Springs may be contaminated by surface water or other sources on or below the ground surface.



The *GEMS Source-Water Protection Plan* identified the following concerns with respect to protecting the Scotch Hill springs from contamination:

- Water that is infiltrating Spring No. 3 may not be suitable for public drinking water needs;
- The area where the springs are situated is sensitive to groundwater pollution; and
- The springs are located in an area that is sensitive to impacts associated with future development.

The *GEMS Source-Water Protection Plan* also defined the Town's water supply watershed and the *primary spring water protection area* and *secondary spring water protection area* (See Map No. 1). The following is a summary of recommendations from the *GEMS Source-Water Protection Plan:*

- Monitor springs for contaminants related to agricultural and residential land uses - including fuel oils, household chemicals and automotive chemicals;
- Take Spring No. 3 off-line, disconnect it from Basin No. 2 and remove the spring box; and
- Residential land use can be seen directly upslope from the springs, care should be taken to minimize the effects of household hazardous wastes, fuel oil and other potential releases as they could be detrimental to the spring water below.

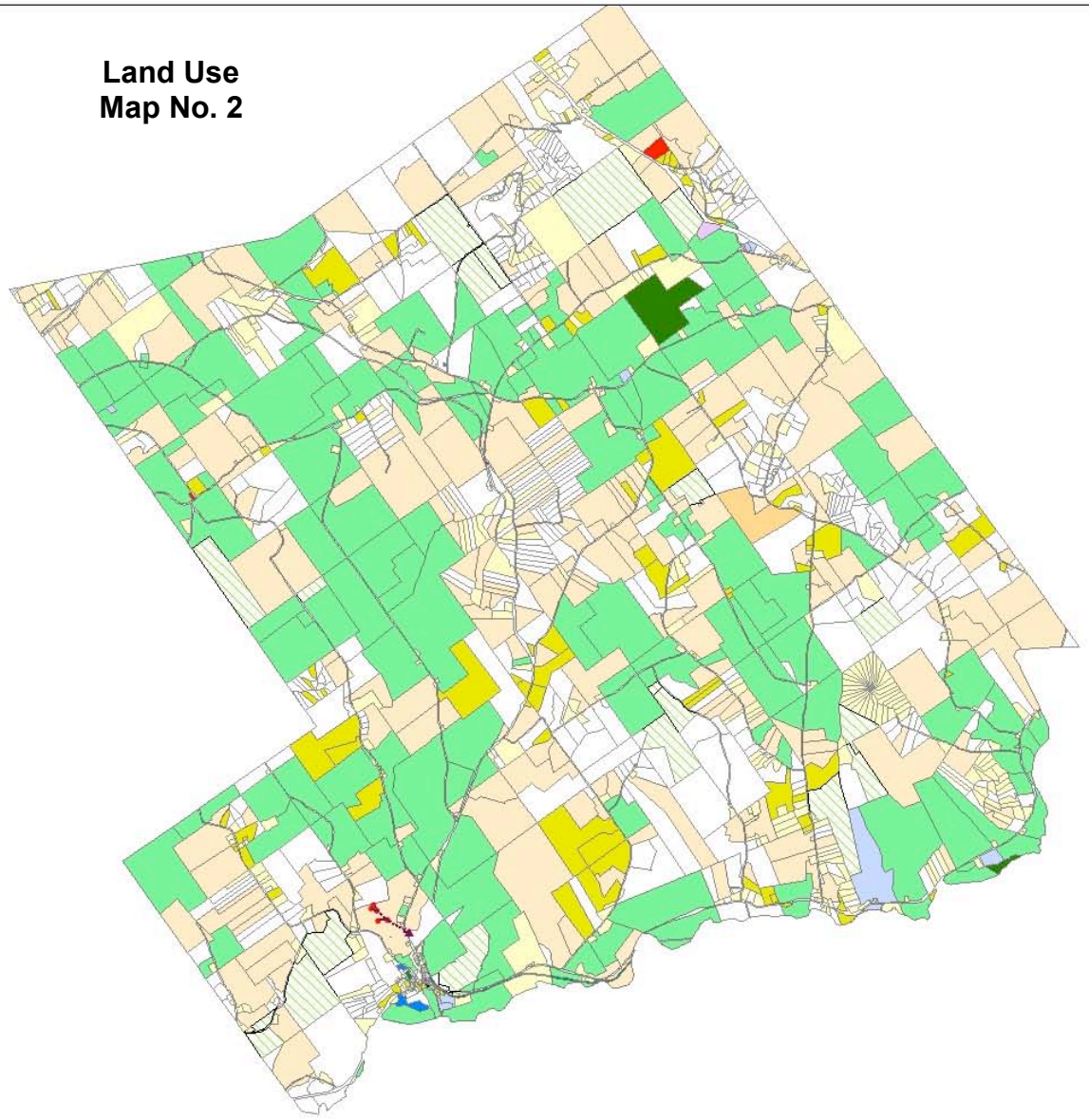
1.2 Town of Kortright Well Field

In addition to its springs, the Town's drinking water supply is supplemented by two (2) wells that reside in an area of sand and gravel that is approximately 75-100 feet in depth. The wells are situated between West Harpersfield Road (CR33) and Wright Brook and are contained within a chain link fence enclosure. The water that is drawn from these wells - along with the Town's spring water - is processed in two (2) adjacent well houses where sanitary system maintenance is provided.

The region lying upslope from the Town of Kortright well field is primarily comprised of agricultural lands, cultivated fields and low-density residential development (see Map No. 2 - Land Use). The Town of Kortright's well field is surrounded by farmland with cultivated fields that are within a few feet of the well houses and well fields (see aerial photo below).

Above (top to bottom): An active farm at the very northern edge of the *secondary spring protection area* for the Town's springs as defined by GEMS in their Source-Water Protection Plan; three surface water bodies that are situated within the *primary spring protection area;* single-family residence with on-site individual well and septic system that is situated a few hundred yards northwest of the Town's springs.

Land Use
Map No. 2



Town of Kortright
Land Use Classification
Delaware County, New York

Legend

Land Use Classification

Property Class Code

- Agricultural & Farmland
- Low Density Residential
- Medium Density Residential
- Very Low Density Residential
- High Density Residential
- Vacant Land
- Commercial
- Warehouse & Storage
- Mixed Use
- Public Parkland
- Institutional
- Governmental
- Manufacturing
- Public Utilities
- Private Conservation Land
- Public Parkland
- Spring Locations
- Well Locations

N
W E
S

SCALE

0 0.25 0.5 Miles

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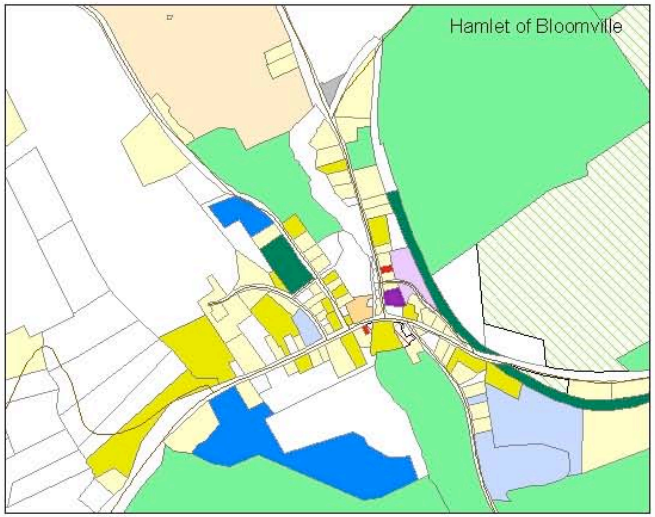
File Location: I:\Project\DELAWARE\KORTRGH\SourceWater\Town LandUse.mxd
Creation Date: January 18, 2010



According to the GEMS Source-Water Protection Plan, the wells are located within a geomorphic setting conducive to accelerated groundwater movement from northwest to southeast. "The region needs to be monitored from contaminants with fate and transport models exceeding one month" (GEMS SWPP).

Potential sources of contamination affecting the well field include manure (e.g. pasture or manure spreading runoff), fertilizers, fuel oil and hazardous household wastes. The application of road salt to West Harpersfield Road (CR 33), is another potential source of contamination that needs to be carefully monitored. The GEMS SWPP identified a variety of measures that could be employed by the Town to protect its wells. A summary is provided below:

- Monitor wells for agriculturally related contaminants including pesticides, herbicides, fuels, oil and greases;
- Post signage prohibiting unauthorized access to the buildings and fenced areas;
- Make sure all caps are on wells; and
- Create a Plan to handle a vehicular incident that compromises the well houses and wells. GEMS states, "This system is close to a rural thoroughfare which may present an accident risk."

With respect to the latter recommendation, it is further recommend that safeguards be put in place to prevent damage to the water supply system including the well houses and wellheads.

All of the drinking water from the Town's springs and wells are fed into the well houses where sanitary maintenance of the water supply is provided. If a vehicular accident or flood event impacts the well house it could effectively result in the entire water supply system being shut down for an extended period of time.

The well house is located within a few feet of CR33. This proximity presents an inherent risk to the water supply system from motor vehicle accidents. Safeguards that should be put in place to mitigate the potential of traffic-related accidents affecting the these facilities include the following:

- Install bollards around well house and wellheads to prevent vehicular encroachment into these facilities; or
- Create an earthen berm along the CR33 to prevent vehicles from accidentally hitting the pump house or wellheads.

The proximity of the well house to the Wright Brook also raises concerns related to flooding, which carry contaminants downstream.

The Town also maintains a water storage tank as part of its municipal water supply system. The tank has a storage capacity of approximately 81,000 gallons. The Town's springs are gravity fed into the water tank that is situated on Scotch Hill. From the water storage tank, the drinking water is gravity fed to the well house where the water receives basic sanitary maintenance.

Above (top to bottom): The Town of Kortright's well house that is situated a few feet off of West Harpersfield Road (CR 33); view of Town's Well No. 1 and Well No. 2 that abut the well house; and view of typical Spring House that is utilized by the Town of Kortright. The greatest threat of contamination to each of these water sources is related to *agricultural* and residential land uses. The proximity of the Town's wells to CR 33 is also a concern as it relates salting for deicing.

1.3 Water Storage Tank

This Column Reserved.

The water storage system consists of an 81,000-gallon steel tank that is situated on the eastern margin of Scotch Hill. The surrounding land uses to the north, east and south consist of woodlands.

While the steel tank is situated in a remote and fairly inaccessible location, it is not protected by a chain link fence enclosure that would prevent unauthorized access. As a result, a person hiking or riding an All Terrain Vehicle (ATV) could easily navigate an old wood road leading to the water tank and gain unrestricted access to the public water facility.

It is important to restrict unauthorized access to the Town's water supply tanks to prevent unauthorized access, vandalism and deliberate contamination of the Town's Water Supply System.

Additional measures should be employed to restrict unauthorized access to the woods road leading up to the water storage tank. Large stones or bollards should be placed at the entrance of the woods road and near the water storage tank to restrict unauthorized vehicular access to this facility. It is also recommended that fencing be installed around the perimeter of the water tank to restrict any unauthorized access to the water tank itself and prevent intruders from climbing on top of the water tank.

Above (top to bottom): View of water storage tank looking southeast toward Town well house; view of water tank looking northwest toward springs; and view of water tank as seen when looking northwest from Town well house. The Town of Korthright's Water Storage Tank is situated on a eastern margin of Scotch Hill high above the Town's well house. From there, spring water is gravity fed to the well house.

CHAPTER 2
PROJECT OBJECTIVES

The primary objectives of this *Spring Water and Wellhead Protection Plan* are to:

- Protect the Town of Kortright's drinking water resources;
- Evaluate the needs for protection of the Town's water supply system;
- Determine suitable protection techniques for spring and well source waters;
- Identify specific land use tools that can be used to protect source waters; and
- Create a foundation for future funding.

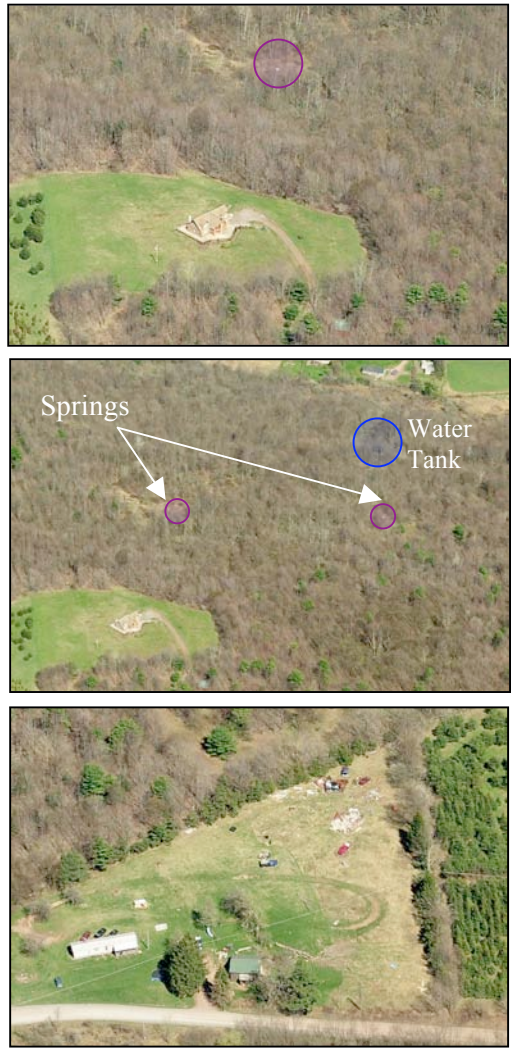
The source waters for the Town of Kortright's water supply system are susceptible to contamination. The springs are very susceptible to contamination from upland runoff because the water feeding them typically flows through the ground for only a short distance, limiting the amount of natural filtering that can occur. Spring No. 3 was recently taken off-line due to it being at risk for surface water infiltration.

The Town of Kortright is implementing a *Spring Improvement Project* that will remove the springhouses, basins and connections related to Springs No. 2 and No. 3. This is because these springs may already be receiving waters under the influence of surface water. The water volume from Spring No. 2 and No. 3 will be replaced by a springhouse next to Spring No. 1.

The Town's Water District only owns the lands immediately surrounding its springhouses [e.g. largest springhouse parcel is 4,800 square feet]. The Water District - through *easements* - also has rights to take all waters from the springs and the right to convey said water through an underground piping system that crosses private lands to the water storage tank. The District also has an easement along a right-of-way to gain access to its springs and water tank. The only restriction on lands surrounding its springs is a 250-foot separation of sewage systems.

The Town of Kortright has Subdivision Regulations, but the Town Board has not adopted Site Plan or Zoning Regulations. As a result, the Town can do little to regulate development density or control land uses in the area that lays upslope of its springs. Such tools could help to protect the springs by prohibiting certain land use activities that pose an inherent risk to the Town's springs.

The Town Board has determined that additional protections for the *Scotch Hill Springs,* that are a vital part of the drinking water supply for the hamlet of Bloomville, are necessary. In this Plan, we will explore a variety of land use controls and/or local laws that could be put in place to better protect these springs. These issues are discussed further in Chapter 3.0 – Land Use Analysis and Chapter 4.0 – Land Use Law Recommendations. The other source of drinking water is the well field located between West Harperfield Road and Wright Brook.

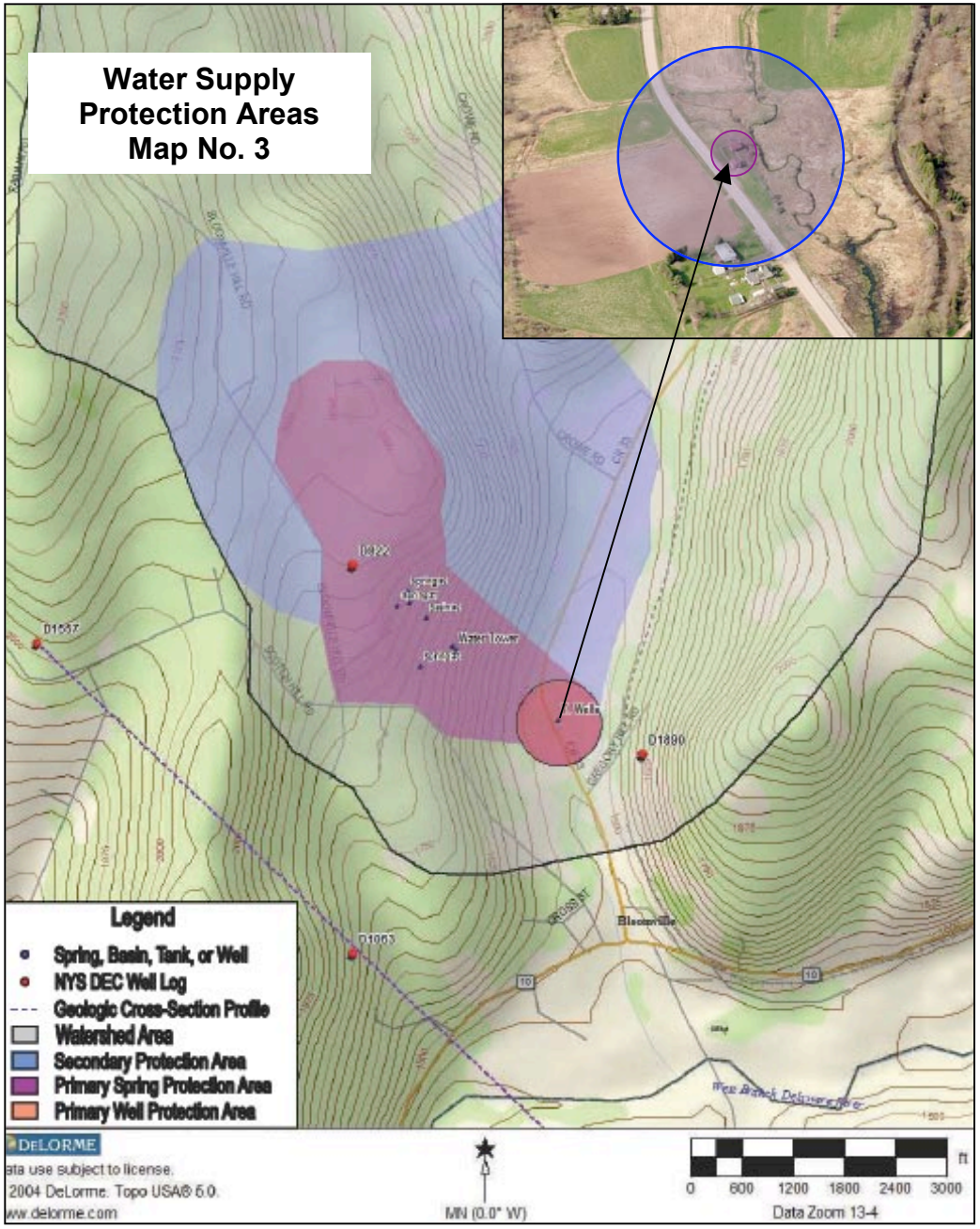


Above (top to bottom): Aerial view showing proximity of single-family home with large lawn and on-site septic system to nearby spring house; view of same house in context of springs and water tank; storage of junk vehicles on a property off of Bloomville Hill Road. Each of the land uses shown above are potential sources of spring water contamination and lay in the *primary spring protection area* as recommended by GEMS.

The primary objective the GEMS Source-Water Protection Plan (SWPP) was to identify potential threats to the Town of Kortright's springs and well field and to recommend source-water protection measures. In its report, GEMS identified the *primary and secondary spring protection area* along with the *primary well protection area* (see Map No. 3).

"The New York State Department of Environmental Conservation usually adds a condition to a Water Supply Permit for a public well supply stating that "*all land within 200 feet or 60-day minimum time-of-travel, whichever is greater, of any production well shall be protected and controlled in order to prevent pollution of the ground or groundwater by direct ownership of the land or by the acquisition of protective easements of other appropriate measures" (GEMS SWPP).*

The Town does not own the land within a 200-foot radius of its wellheads nor does it have a conservation easement on these lands. The *primary well protection area* includes a variety of land use activities that could contaminate the wells. Of particular concern are pathogens from manure spreading; and nitrate loading from croplands, septic systems or road salt. In Chapter 3 - Land Use Analysis, we look at land uses that are situated within the *primary and secondary water protection areas* and discuss a variety of measures that can be put in place to protect these drinking waters. Resident education and participation will also be needed.



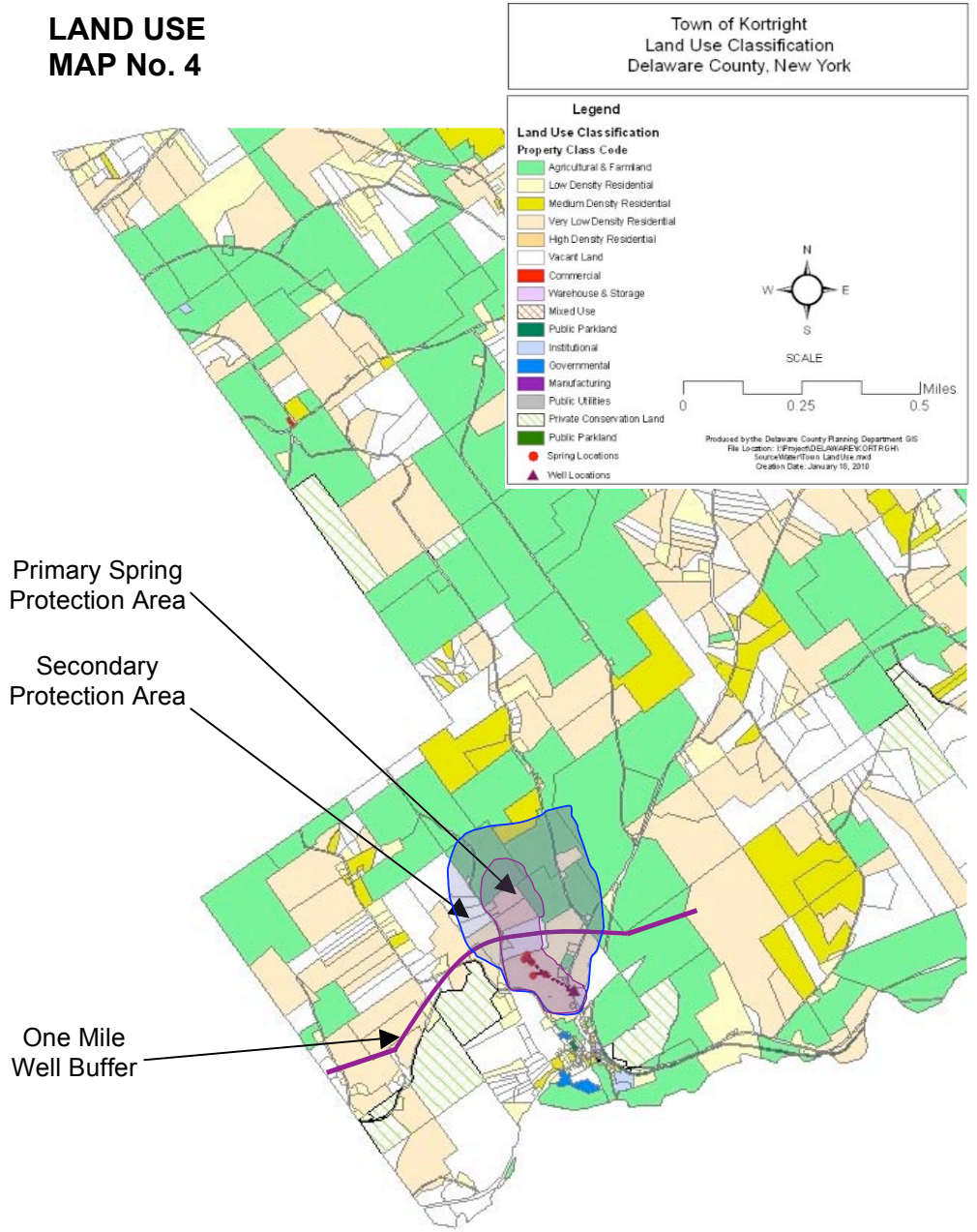
CHAPTER 3.0
LAND USE ANALYSIS

The Town of Kortright has a land area of 62.71 square miles and a population density of only 26.1 persons per square mile. Land use refers to how people use their land within a community. Land use is usually described in broad categories such as agricultural, commercial, community services, industrial, parks, public utilities, recreation, residential, and vacant land. The density of housing further defines residential land uses. In 2000, the Town had a housing unit density of 15.9 houses per square mile according to the U.S. Census Bureau. The existing land uses, by parcel, that surround the Town's springs and wells are shown on Map No. 4.

Table 3.1 – Land Use Analysis

Land Use	Acreage	Percentage
Agricultural	13,065.42	33.21
Very Low Density Residential	10,533.39	26.77
Vacant Land	8,938.02	25.00
Low Density Residential	2,741.07	6.96
Public & Private Recreation	1,975.93	5.00
Institutional	186.97	0.47
Medium Density Residential	170.62	0.04
High Density Residential	132.52	0.03
Commercial	23.25	0.06
Warehouse & Storage	17.64	0.004
Governmental	17.22	0.004
Manufacturing	1.48	0.003
Public Utilities	0.63	0.0001
Mixed Use (Commercial/Res.)	0.25	0.0006
Total	**39,340.08**	**100.0**

LAND USE
MAP No. 4



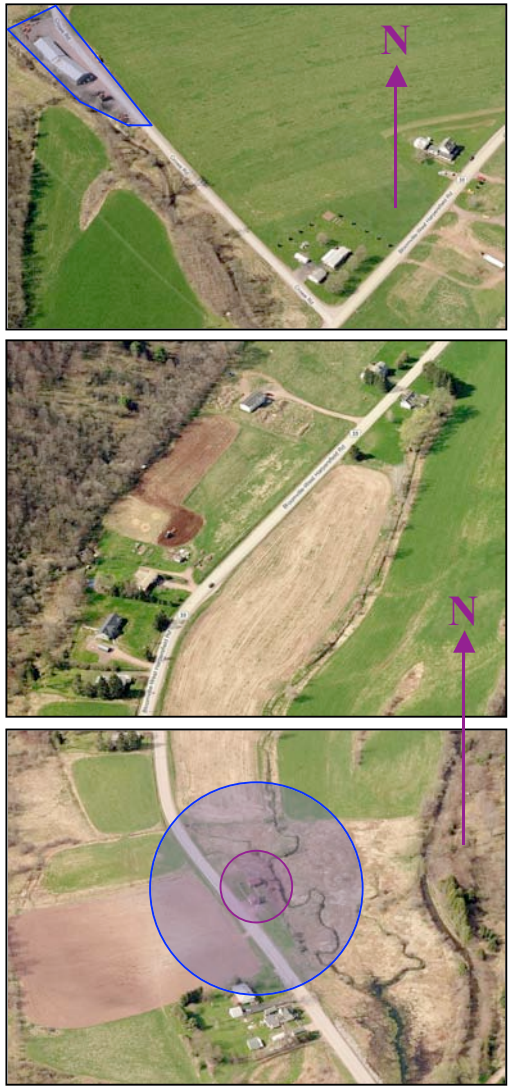
Having a clear picture of the existing land-use patterns within the *primary spring protection area* and *secondary protection area* is very useful when trying to identify specific land use tools that should be used to help protect the drinking waters for the Town of Kortright. The predominant land uses within the primary and secondary spring protection areas are *agriculture and farmland, very low density residential*, and *vacant land*. There are also a few parcels within the protection areas with low-density residential or medium density residential development. Presently, there are no commercial or manufacturing land uses within the primary or secondary protection areas.

"Development up-gradient from the springs, within the zone of contribution, should be extremely limited as the infiltrating surface water plays a more significant role in the recharge of the springs, and influence the fate and transport of contaminants to the spring heads. In this environment, contaminant transport rates are accelerated and degradation rates decreased meaning that the likelihood for adverse affects from contamination is amplified. Therefore, these areas should be protected as primary recharge areas for the springs, and development should be limited." GEMS SWPP

While the existing development pattern within the protection areas is very low density, Scotch Hill does afford scenic views making an attractive setting for new homes. Selective timber harvesting is also likely within this area.

Cultivated fields, pastures and vacant land lying east of Wright Brook are the primary land uses that surround the Town of Kortright's well field. The predominant land uses within the 200-foot *primary well protection area* is almost equally divided between cropland and vacant land. West Harpersfield Road (CR 33) runs through the center of the primary well protection area. Both of the Town's wells are situated only a few yards off of the County Highway. "Much of the source water protection area in the Town is very rural in nature, with pasture/hay cover as well as crop land prevalent. The most significant concerns with these areas include nutrient loading (nitrates, etc) and the release of bacteria from fertilizing. Care should be taken when conducting these activities within the source water protection area." GEMS SWPP

Other potential sources of contamination include the introduction of nutrients or pathogens from manure or road salts into the Town's wells. Nutrients and pathogens contained in manure can be carried by runoff into water resources. Road salt can reach groundwater when it is applied during snowstorms and is mixed with snow that is plowed off the highway and onto abutting properties. When the snow banks melt, the meltwater, and dissolved salt, can migrate through the soil and move into the water table. Studies have found that wells that are most likely to be impacted are those within 100 feet down slope of the roadway and in the direction of groundwater movement. The Town of Kortright's well field fits this description.



Above (top to bottom): Highway Department Garage on Crowe Road that abuts the Wright Brook and is situated northeast of the Town's well fields; aerial view of low-density residential and agricultural land uses abutting CR 33 north of well fields; and aerial view of well fields, well house, and graphic illustration of 200-foot well protection area.

Since there is the potential for road salt contamination, some basic mitigation measures should be put in place to protect the Town's wells. It is recommended, that the Town coordinate with the County Highway Department to reduce the amount of salt that is applied in the vicinity of the Town's wells. *The Town could also work with the County Highway Department to improve the drainage system in the vicinity of the well houses so that it collects meltwater from plowed snow and directs it away from the Town's wells.*

Within the 200-foot well protection area, the application of fertilizers and manure to croplands poses a particular threat to the Town's wells. The GEMS SWPP described such activities with the source water protection areas as a concern to the Town's wells. Such activities within the 200-foot wellhead protection area increases the risk of contamination significantly.

Another threat to the well field source waters is the inadvertent introduction of contaminants from upslope agricultural practices. *Best Management Practices (BMPs) of agricultural activities, upslope of the well fields, in needed to prevent contamination of the aquifer.* BMPs related to manure & stormwater management should be encouraged within the primary & secondary well/spring protection areas. The Town's wells should also be periodically monitored to detect agriculturally related contaminants including pathogens, nutrients, pesticides, herbicides, fuels and oil.

Another potential area of concern is the introduction of contaminants through the wellheads themselves since they are not sufficiently protected to prevent motor vehicles or heavy equipment from hitting these wellheads in the event of a motor vehicle accident. Measures should be taken to provide bollards and/or other barriers around the wellheads to prevent accidental or deliberate damage that could allow contaminants to enter the wellhead – thereby contaminating the Town's well field.

West Harpersfield Road (CR 33) runs through the center of the primary well protection area and there are already a number of homes along this highway. The broad valley floor is well suited for residential development due to relatively gentle slopes. The area is attractive for residential development due to highway access and the views across the valley floor to the surrounding hillsides. With new residential development comes the increased risk associated with household contaminants impacts related to residential septic systems.

Most of the land area within the Town's *primary spring protection area* consists of very low-density residential and vacant lands. Most of the land area within the Town's *primary well protection area* consists of very low density residential and agricultural land uses. For the land uses that are closest to these resources, educational activities and land use regulations aimed at existing owners will have the most impact in terms of protecting the water quality.

Above (top to bottom): Town of Kortright well house within a few feet of County Highway 33; interior of well house where the water from the springs and wells receive basic sanitary maintenance; and view of County Highway 33 a few yards from the well house showing grade sloping away from road toward well field and speed limit.

Problem: With large residential lawns comes the risk of potential contamination of the Town's springs from the application of lawn fertilizers.

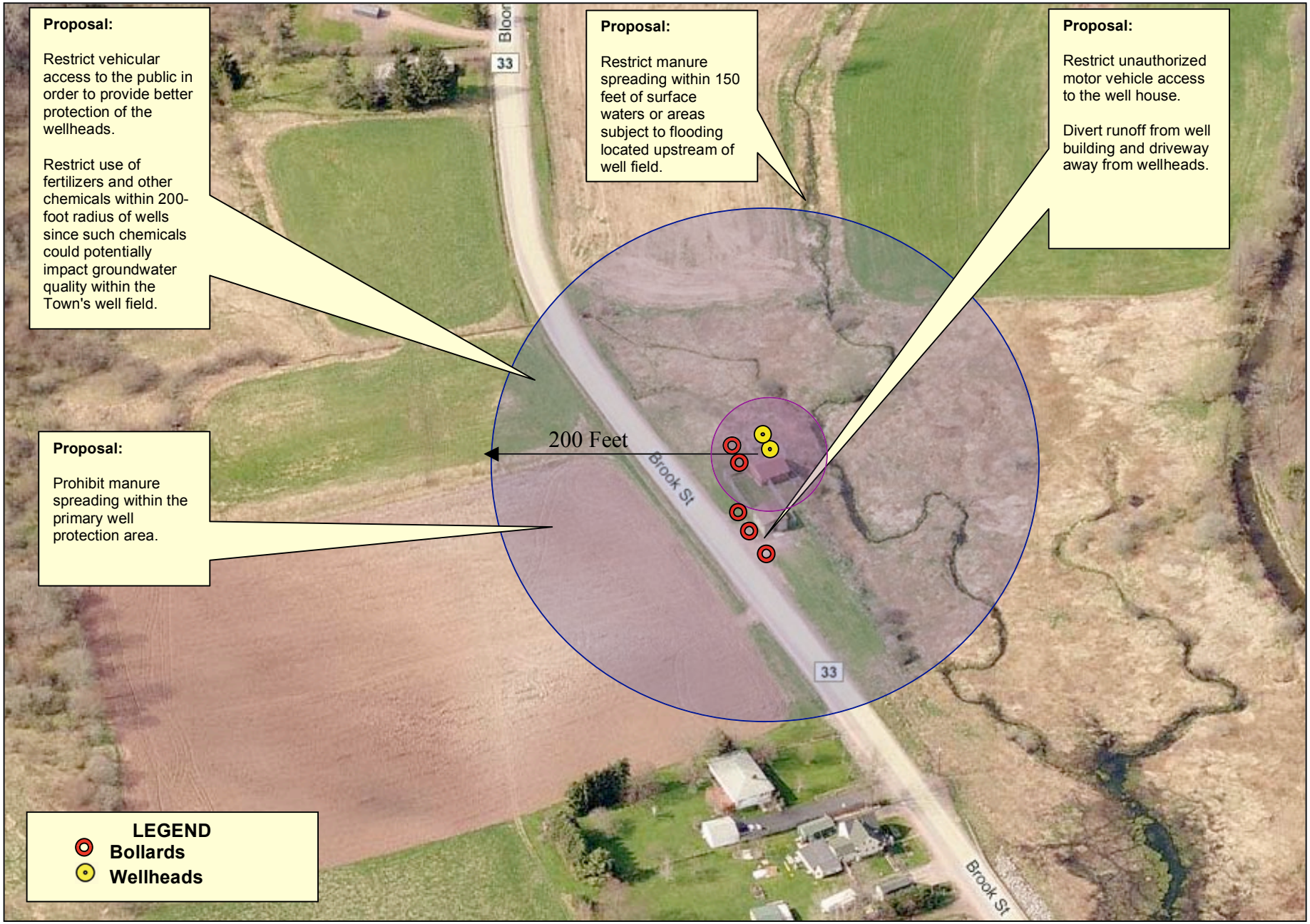
Problem: While the land surrounding the Town's springs is presently wooded, the Town does not own private lands that surround its springhouses. Residential homes on these lands would adversely affect the springs.

Action: The Town should seek funding to acquire the lands in the immediate vicinity of its springs and/or secure *conservation easements* on lands within the *primary and secondary spring protection areas*.

Below: View of water flowing downhill as it leaves the Town's primary springhouse. The Town is losing a large volume of potential drinking water from this spring that could be captured with a new springhouse

Action: To better protect the springs from contamination, access to the springhouses should be restricted. If the Town Board is unable to secure funding for *property acquisition or* the purchase of *conservation easements*, then it is highly recommended that the it create a pubic education program and enact land use regulations to protect its springs. It is strongly recommended that a *Spring-Water Overlay Protection District* be established to regulate activities that could adversely affect the springs.

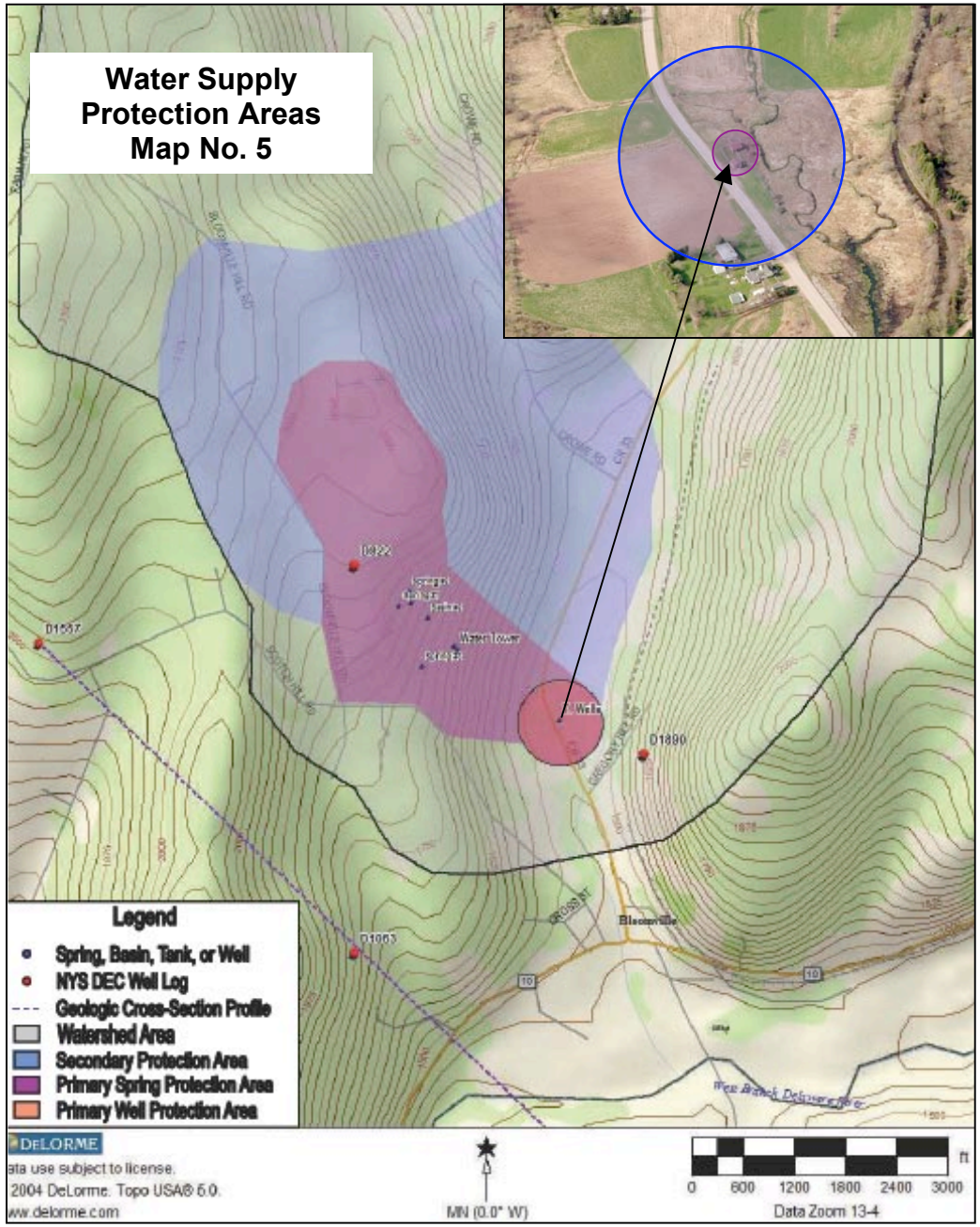
Above: One of several springhouses that are situated up on Scotch Hill on lands that are leased to the Town of Kortright. The Town's springs are situated down slope from some newer single-family residential development and agricultural land uses. The approximate boundary of Town parcel surrounding springs is shown by shaded polygon.


Proposal:
Restrict vehicular access to the public in order to provide better protection of the wellheads.
Restrict use of fertilizers and other chemicals within 200-foot radius of wells since such chemicals could potentially impact groundwater quality within the Town's well field.
Proposal:
Restrict manure spreading within 150 feet of surface waters or areas subject to flooding located upstream of well field.
Proposal:
Restrict unauthorized motor vehicle access to the well house.
Divert runoff from well building and driveway away from wellheads.
Proposal:
Prohibit manure spreading within the primary well protection area.
200 Feet
Brook St
33
LEGEND
Bollards
Wellheads

Summary

The Town's springs and the well fields will continue to be impacted by existing land use. Today, most of the land area within the *primary spring protection area* consists of very low-density residential development. The immediate threats involve the introduction of contaminants from home hazardous wastes, on-site septic systems or the application of lawn fertilizers. The most effective way to address these threats is through educational programs for existing homeowners. Looking ahead, the greatest threat to water quality is new development or timber harvesting near the Town's springs. Proactive measures are needed to address these concerns. These include the creation of a *Spring Water Protection Overlay District*, getting conservation easements on lands surrounding the springs or simply acquiring the lands around the springs.

Most of the land area within the Town's *primary well protection area* consists of low-density residential and agricultural land uses. However, existing land uses such as agriculture & farmland are potential sources of contaminants that must continue to be carefully monitored. The voluntary incorporation of Agricultural Best Management Practice (BMPs) by area farmers should be encouraged within the *secondary protection area* to prevent contamination of the Town's well field. The Town and County should assist farmers in getting grants to implement BMPs. Within the Town's well field, wellhead protection should also be enhanced.



CHAPTER 4.0
LAND USE LAW RECOMMENDATIONS

The Town of Kortright only owns the lands immediately surrounding its springhouses [e.g. largest springhouse parcel is 4,800 square feet]. The only restriction on private lands surrounding its springhouses is a deed restriction that requires a minimum 250-foot separation of sewage systems from the springhouses. Presently, there is nothing in place to restrict residential development on the private lands surrounding the springhouses and it is conceivable that homes could be developed on these lands, which would create a new potential source of contamination.

Presently, a Town *Subdivision Law* is the only land use regulations that have been adopted by the Town of Kortright Town Board. The Subdivision Law would only come into play if the owner of the lands surrounding the springs decided to subdivide the property at some point in the future. If this were to occur, the Town Planning Board would have an opportunity - through the subdivision approval process - to ensure that lots were of sufficient size to accommodate on-site septic and wells. The Planning Board would have a say in the proposed layout of lots and driveway access. If a new road were proposed they would specify construction standards and ensure that related sediment and erosion control and stormwater management issues were addressed.

The *Subdivision Law* is useful in helping to mitigate potential impacts resulting from the subdivision of lands surrounding the springs. However, it would do little to control density or land uses since the Town Board has not adopted a Zoning Law for the Town of Kortright. Presently, a home could be built on these lands simply by applying for a building permit.

A *Local Law for Spring Water and Wellhead Protection*, defined by an Overlay District, could also be established for the *primary & secondary spring protection area* and *primary wellhead protection area* - to limit certain land uses. For example certain land uses that pose an inherent risk to the source waters [e.g. junkyards or contractors storage yards] or activities such as manure spreading in the *primary well protection area* could be prohibited within the *Overly District*. Agricultural BMP's for manure management should also be required.

A *Zoning Law* would enable the Town to regulate development density by establishing minimum lot sizes; and land use by establishing a list of permitted uses within each zoning district. For example, a minimum lot size of two (2) acres could be established - resulting in a maximum permitted density of ½ dwelling unit per acre. Under a Zoning Law, any use that is not listed as a permitted use in a certain zoning district would be prohibited. A Zoning Law with an AG-Agricultural District, HC-Hamlet Center and RR-Rural Residential District could be used to effectively regulate density and land use.

"A ZONING LAW WOULD ENABLE THE TOWN TO REGULATE DEVELOPMENT DENSITY BY ESTABLISHING MINIMUM LOT SIZES AND LAND USE BY ESTABLISHING A LIST OF PERMITTED USES WITHIN EACH ZONING DISTRICT."

4.1 Scotch Hill Springs

As discussed above, the Town of Kortright only owns a small land area immediately surrounding its springhouses. There are few land use restrictions on the privately owned lands that surround the Town's springs. To date, the existing relationship has served the community's needs, but a change in ownership or desire by the present landowners to develop a portion of the lands surrounding the springs could adversely affect the water quality of the springs.

The surest way to protect the Towns springs would be for the Town of Kortright to acquire more lands surrounding its springhouses. Another option that should be explored is the acquistion of a *conservation easement* that would restrict certain land use activities on private lands surrounding the springhouses in exchange for compensation to the land owner. The Town of Kortright could also adopt a *Local Law for Spring Water and Wellhead Protection* - defined by an *"Overlay District"* - to prevent certain land uses from occuring within the primary and secondary protection areas for its source waters.

The activities, which should be restricted or regulated within the *Spring Water Protection Overlay District,* include but are not limited to: junkyards, chemical storage, wastewater lagoons, fertilizer storage, pesticide and herbicide use, salt storage sheds, placement of underground oil tanks, manure spreading and activities posing an inherent risk of springwater contamination.

4.2 West Harpersfield Road Wells

West Harpersfield Road (CR 33) runs through the center of the 200-foot radius *primary well protection area* surrounding the Town's wells. The predominant land uses within the *primary well protection area* consists of cropland, pastures and vacant land. The most significant contaminant concerns include nutrient loading from nitrates and chlorides from road salt or nutrients and pathogens from spreading manure.

Nitrate can originate from crop fertilizers and manure spreading in agricultural areas. These nutrients can readily leach through the soil and contaminate groundwater. Storm runoff and snowmelt from treated roads can carry sodium and calcium chlorides in the groundwater. Lastly, pesticides or manure applied to crops within the *primary well protection area* could adversely affect the Town's well field. The Town Board should secure a *conservation easement* on all lands within the 200-foot radius primary well protection area to prohibit those activities that threaten the quality of these wells.

The strategy for protecting groundwater quality should focus on *education and voluntary* actions of residents and farmers. For example, farmers should be encouraged to stop spreading manure within 150 feet of the Wright Brook. They should also be encouraged to reestablish the *riparian buffer zone* along the Wright Brook, upstream of the well field. Riparian zones help to absorb nutrients, which protects water quality.

"The Town Board should secure a conservation easement on all the lands within the 200-foot radius primary well protection area to prohibit those activities that threaten the quality of these wells."

Possible sources of groundwater contamination include leaking heating oil tanks, leaking automotive fluids and improper use or disposal of hazardous household wastes such as automotive fluids and lawn and garden products. Improperly maintained or poorly constructed septic systems are another potential source of ground-water contaminants including, but not limited to, coliform bacteria, nitrates and hazardous household waste such as paints or other solvents are other concerns.

It is recommended that strategies for controlling manure spreading; herbicide, pesticide and fertilizer use; and associated runoff within the *secondary protection area* for the Town's springs and wells focus on education and voluntary adherence to agricultural "Best Management Practices." Best Management Practices (BMPs) are agricultural and production guidelines developed to minimize off-site runoff damage while maintaining the profitability and stability of farming operations.

Other land use tools are needed to better protect the Town's springs, well fields and wellheads from potential contamination. Based upon the above, there are a number of specific actions that the Town Board and Delaware County can take to better protect these sourcewater. These include educational, voluntary and regulatory measures that must be employed to protect these source waters. These are summarized in Chapter 5.0 – Implementation Plan.

The Scotch Hill springs provide a significant percentage of the drinking water that the water district supplies to the hamlet of Bloomville. If this water source were to become contaminated, the Town would have to reply solely upon its wells to provide potable water to its residents. Such a drawdown on the wells could affect water quality and the close proximity of the wells to one another limits back-up capabilities [i.e. the wells are situated within a few feet of one another]. If the springs were taken off-line, the water district would also lose its storage capacity and the advantage of having a gravity fed water supply system.

Every effort should be made to protect the quality of the Town's springs so that they can continue to supply drinking water to the water district along with needed storage capacity via the 80,000 storage tank that they feed. If the springs are not protected, this water source could be lost or the spring water may have to be filtered to meet Department of Health requirements for a public water supply.

The Town could conceivably install *sand filters* in the well house to filter the spring water should such measures become necessary. However, providing sand filters would add a considerable capital cost, not to mention on-going operation and maintenance costs and should only be pursued as a last resort. The implementation of this Plan can help to avoid the need for such drastic measures in the future.

"It is recommended that strategies for controlling manure spreading; herbicide, pesticide and fertilizer use; and associated runoff within the secondary protection area focus on education and voluntary adherence to agricultural Best Management Practices (BMP's)."

CHAPTER 5.0
IMPLEMENTATION PLAN

This *Spring Water and Wellhead Protection Plan* is intended provide a framework through which the Town Board can take proactive measures to protect its drinking water supplies, which are at risk of contamination from a variety of land use activities. In 2008, the Town Board retained the services of Geo-Environmental Management Solutions, LLC (GEMS) to conduct field research of its water sources. The GEMS report defined the *primary and secondary protection areas* for the Town's water supplies, which is the focus of this Chapter 5.0 - Implementation Plan.

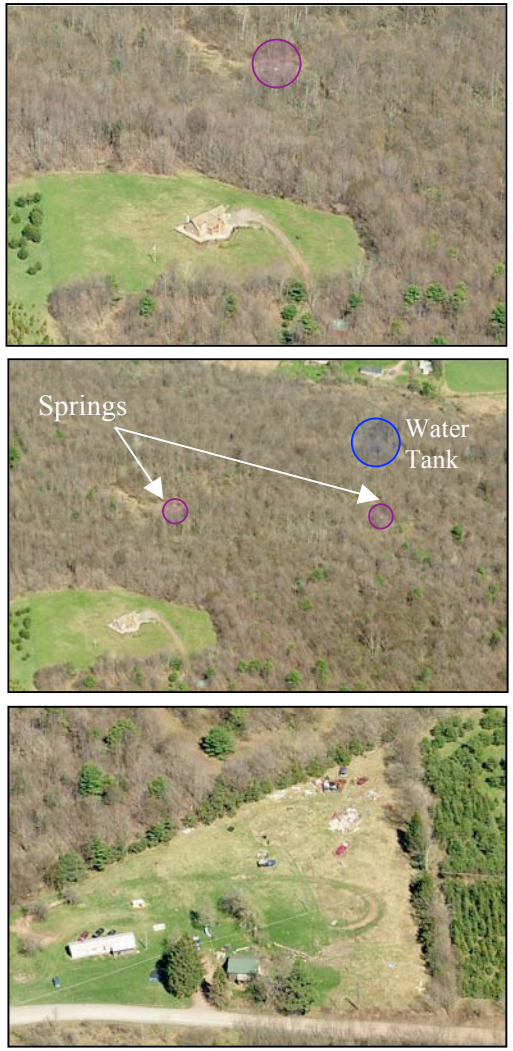
There are a variety of measures that can be taken to protect the Town's drinking water supplies. These include educational activities, regulatory measures or the acquisition of lands and/or conservation easements. The former offers the least cost with the least assurance that drinking water sources will be protected. The latter the greatest potential cost with the greatest assurance of water quality protection. A combination of approaches is likely the best way to proceed so that immediate safeguards are put into place.

It is recommended that educational activities and voluntary approaches be the first strategies that are employed to protect the drinking water supplies from contamination. These approaches offer the greatest potential for more immediate and successful plan implementation.

Nearly all the lands within the *primary and secondary protection areas* are privately owned and already consist of a variety of very low-density residential and agricultural land use activities. Consequently, ensuring that existing landowners don't inadvertently participate in activities that could adversely affect the Town's springs or wells is the first line of defense.

Single-family households pose pollution risks due to the storage, use and disposal of potentially polluting substances. Possible sources of groundwater contamination include leaking heating oil tanks, leaking automotive fluids and improper use or disposal of hazardous household wastes such as automotive fluids and lawn and garden products. Improperly maintained or poorly constructed septic systems are another potential source of contaminants including but not limited to coliform bacteria and nitrates. *Educational pamphlets should be developed for distribution to residents in the protection areas.*

Strategies for controlling manure spreading, herbicide, pesticide and fertilizer use and associated runoff related to farming within the *primary and secondary protection areas* should focus on education and voluntary adherence to agricultural "Best Management Practices (BMP's)." BMPs are agricultural and production guidelines developed to minimize off-site runoff damage while maintaining the profitability and stability of farming operations. Specific educational and voluntary measures are provided in the implementation tables within this Chapter.



Above (top to bottom): Aerial view showing proximity of single-family home with large lawn and on-site septic system to nearby spring house; view of same house in context of springs and water tank; storage of junk vehicles on a property off of Bloomville Hill Road. Each of the land uses shown above are potential sources of spring water contamination and lay in the *primary spring protection area* as recommended by GEMS.

This Plan recognizes that voluntary approaches are only one facet of a comprehensive spring water and wellhead protection effort. To that end, this Plan also outlines specific regulatory approaches that should be considered by the Town of Kortright Town Board in order to protect the Town's drinking water supply and prevent contamination of its source waters.

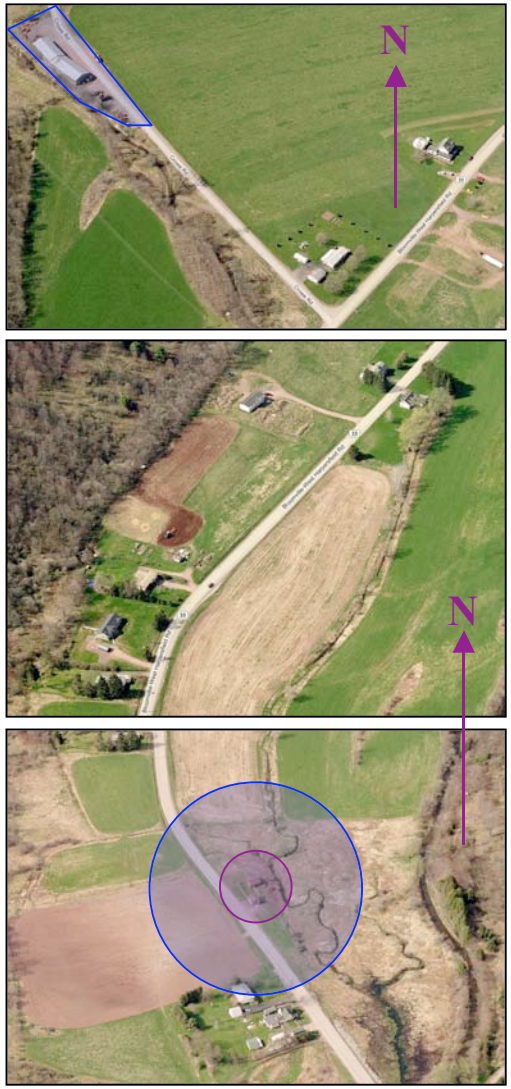
The most immediate regulatory approach, which should be enacted by the Town Board is the adoption of a *Local Law for Spring Water and Wellhead Protection* with an "Overlay District," which is coterminous with the *primary and secondary protection areas* for the its drinking water supplies [see also Chapter 4.0]. For example, certain land uses that pose an inherent risk to the Town's source waters [e.g. junkyards, gas stations and contractors storage yards] could be prohibited within an *Overly District*, while still allowing these land uses elsewhere in the Town. In this way, the Local Law would help to protect the Town's drinking water supply.

The Town could also create a *Zoning Law & Zoning Map* for the entire Town with an Overlay District for the *primary and secondary protection areas.* These are a few regulatory approaches that could be taken to better protect the Town's drinking water supply. It is recognized that the creation of a Zoning Law is something the Town Board may not be interested in pursuing at this time. Thus, the creation of a Zoning Law and overlay district is something that should be looked at as a long-term solution.

The remaining implementation strategies focus on the acquisition of lands and/or *conservation easements*. With respect to the Scotch Hill Springs, the acquisition of the properties surrounding the springs would provide the greatest protection of the drinking water supply. If these lands were acquired, the Town could prevent unauthorized access to the property and keep the lands undeveloped to protect the springs. The Town Board should pursue the acquisition of a conservation easement within the primary spring protection area (upslope of the springs) if property acquisition is not feasible.

There are existing activities within primary well protection area that pose a direct threat to the Town's wells. The Town Board should reach out to abutting landowners to obtain a conservation easement for the *primary well protection area* as soon as possible to protect its wells from contamination. The *primary spring protection* and *well protection areas* are the most susceptible to contamination and need the greatest level of protection. Through well-written *conservation easements* the Town Board could prevent activities, which pose a direct threat to its drinking waters, from occurring.

In the end, the most effective means of protecting the Town's drinking water supply is to take a holistic approach involving a combination of educational and regulatory measures - along with the acquisition of lands or conservation easements. Specific actions are provided in the following implementation tables.



Above (top to bottom): Highway Department Garage on Crowe Road that abuts the Wright Brook and is situated northeast of the Town's well fields; aerial view of low-density residential and agricultural land uses abutting CR 33 north of well fields; and aerial view of well fields, well house, and graphic illustration of 200-foot well protection area.

Town of Kortright Wellhead and Source Water Protection Plan
Educational & Voluntary Strategies to Minimize Potential Pollution Sources

No.	Strategy	Tasks	Action	Priority	Responsibility
1	*Public Education:* Create a public education program regarding lawn and garden maintenance; including natural lawn care alternatives, integrated pest management and appropriate lawn chemical application rates and frequencies.	Develop educational pamphlets and brochures for distribution to homeowners within the *primary and secondary protection areas* as defined by GEMS.	Form Committee	Immediate	Planning Board Town Board
			Create Brochure	Immediate	Planning Board Town Board
		Distribute pamphlets to residents and place signs on edge of protection areas to reinforce the need for participation.	Distribute Pamphlets	Immediate	Water Superintendent
2	*Best Management Practices:* Create and distribute *Agricultural Best Management Practices* brochures to farmers within the *primary and secondary protection areas* with a special focus on Stormwater and Manure Management. Also work with area farmers to secure State and federal grants to implement BMPs.	Develop educational pamphlet for distribution to farmers within the *primary and secondary protection areas.*	Create Brochure	Immediate	Town Board County Planning CCE
		Coordinate with Delaware County, Cornell Cooperative Extension and Farm Bureau to help implement BMPs with area farmers.	Public Outreach	Immediate	Town Board County Planning
		Work with area farmers to secure grants to implement BMPs including nutrient and pesticide management plans, riparian buffer zone restoration, etc.	Procure Grant	Short-term	Town Board County Planning CCE
3	*Inventory and Monitoring:* Identify and inventory all residential, commercial and agricultural petroleum storage tanks within *the primary and secondary protection areas*. Continue to monitor the Scotch Hill Springs and the Town's wells for the presence of potential contaminants.	Create an inventory survey and field verify the location of all storage tanks within the *primary and secondary protection areas*.	Inventory	Immediate	Building Inspector Water Superintendent
		Establish an annual inspection schedule to identify integrity of the storage tanks.	Annual Inspection	Short-term	Building Inspector Water Superintendent
		Establish an electronic database with names addresses of owners and inspection results.	Create Database	Short-term	Building Inspector Water Superintendent
4	*Contingency Planning*: Create an Emergency Action Plan to coordinate appropriate agencies in the event of an accidental spill or natural disaster such as flooding of the Wright Brook.	Establish a point of contact at the Town Board along w/ Water Superintendent.	Create Point of Contact	Immediate	Fire Department County EMS
		Post signs along roadways within the *primary protection areas* with emergency numbers to call in the event of a spill.	Install Signs	Short-term	Fire Department County EMS
		Develop a list of agency contacts to notify in the event of a spill or flooding event.	Create Database	Short-term	Fire Department County EMS

Immediate = 1 Year **Short-Term = 1-2 Years** **Long-Term = 2-5 years**

Town of Kortright Wellhead and Source Water Protection Plan
Regulatory Strategies to Minimize Potential Pollution Sources

No.	Strategy	Tasks	Action	Priority	Responsibility
5	*Restrict Public Access to the Public Water Supply System*. Restrict access to the Town's springs, water storage tanks, wellheads and well houses. Place bollards at entrance to right-of-way to springs and around wellheads to restrict unauthorized vehicular access to reduce risk of contamination due to vandalism.	Place bollards or large stones at either side of gate to restrict vehicular access to driveway	Install Bollards	Immediate	Town Highway Dept. Water Superintendent
		Secure funding through the NYSDEP, EPA or other funding sources to construct recommended improvements.	Grant Application	Short-Term	Town Highway Dept. Water Superintendent
		Enhance security fence around tanks to better restrict unauthorized access.	Install Fence	Short-term	Town Highway Dept. Water Superintendent
6	*Enhance Wellhead Protection.* Install bollards and/or other barriers around the well houses and wellheads to prevent accidental or deliberate damage to the wellheads that would allow contaminants to enter the wells. Divert drainage away from wellheads and coordinate with County Highway Department to install drainage and reduce road salts in vicinity of wells.	Install bollards around wellheads and or berms to prevent vehicles from hitting wellheads.	Install Bollards	Immediate	Town Highway Dept. Water Superintendent
		Restrict unauthorized motor vehicle access to the well house property by installing gate to restrict vehicular access to the site.	Install Gate	Short-term	Town Highway Dept. Water Superintendent
		Create swale system to divert runoff from ball fields away from wellheads.	Construction	Long-Term	Town Highway Dept. Water Superintendent
7	Re-establish the *Riparian Buffer Zone* along the Wright Brook in the vicinity of the Town's well field. Riparian zones can help to absorb nutrients thereby helping to protect water quality.	Apply for grants through the EPA Targeted Watershed Grant Funds.	Grant Application	Short-Term	Town Board County Planning
		Encourage private landowners to pursue riparian zone restoration efforts.	Public Outreach	Short-term	Town Board Private Land Owners
		Restore *Wright Brook* riparian zones that lay upslope of the Town's wells.	Plant Trees Secure Grant	Short-term	Town Board Private Land Owners
8	Acquisition of Lands and Conservation Easements within Primary Spring and Wellhead Protection Areas. Identify priority areas for property acquisition and/or where conservation easements should be obtained to better protect the Town's drinking waters.	Secure conservation easement for primary well protection area to restrict certain activities that threaten Town's well.	Conservation Easement	Immediate	Town Board Water Superintendent Private Land Owners
		Secure conservation easements surrounding springs and uplands with primary spring protection area.	Conservation Easement	Immediate	Town Board Water Superintendent Private Land Owners
		Acquire lands surrounding the Town's springs if owners are willing to sell lands.	Property Acquisition	Long-term	Town Board Water Superintendent Private Land Owners

Immediate = 1 Year **Short-Term = 1-2 Years** **Long-Term = 2-5 years**

Town of Kortright Wellhead and Source Water Protection Plan Land Use Regulations to Minimize Potential Pollution Sources					
No.	**Strategy**	**Tasks**	**Action**	**Priority**	**Responsibility**
9	Evaluate funding alternatives. Work with Delaware County to secure funding for Spring Water and Wellhead Protection measures along with water supply improvements.	Coordinate with County Planning Department to identify funding sources.	Form Committee	Immediate	Town Board Delaware County
		Set funding priorities based upon the recommendations provided herein.	Form Committee	Immediate	Town Board Delaware County
		Secure funding through the NYCDEP; EPA or other funding sources to construct recommended improvements.	Grant Application	Short-Term	Town Highway Dept. Water Superintendent
10	*Adopt Local Law for Spring Water & Wellhead Protection. Adopt Local Law with an Overlay District, which is coterminous with the Primary and Secondary Protection Areas for the Town's source waters. Restrict land uses that threaten water supply and require implementation of BMPs within Overlay District.*	Create Steering Committee to development Local Law for Spring Water & Wellhead Protection.	Form Committee	Short-term	Town Board Planning Board
		Town Board and Town Board to adopt Local Law and create Overlay District	Adopt Local Law	Short-term	Town Board Planning Board
		Require Planning Board Review for all "changes in use" within Overlay District to ensure uses don't pose threat to the aquifer.	Adopt Local Law	Short-term	Town Board Planning Board
11	*Adopt Zoning Law with Overlay District for the Primary and Secondary Protection Areas. Restrict land uses that threaten water supply and establish bulk standards to residential building lots within the overlay district.*	Create Steering Committee to development Zoning Law and Overlay District.	Form Committee	Long-term	Town Board Planning Board
		Town Board and Town Board to adopt Local Law creating Overlay Districts	Adopt Local Law	Long-term	Town Board Planning Board
		Require Site Plan Review for all "changes in use" within Overlay District to ensure uses don't pose threat to the aquifer.	Adopt Local Law	Long-term	Town Board Planning Board
12	*Maintain buffers along stream courses and wetlands. Ensure that NYSDEC regulations are enforced during Subdivision Review process.*	Strictly enforce NYSDEC Regulations.	Enforcement	Immediate	Planning Board
		Encourage reestablishment of riparian buffer zones along the Wright Brook.			
13	Stormwater Management. *Ensure that the Planning Board strictly enforces NYSDEC regulations related to stormwater management and erosion & sediment during Subdivision Review.*	Require the preparation of Stormwater Pollution Prevention Plan (SWPPP) when required by NYSDEC Guidelines.	Enforcement	Immediate	Planning Board Town Board
		Ensure that stormwater Best Management Practices are followed.	Enforcement	Short-term	Planning Board Town Board
Immediate = 1 Year		**Short-Term = 1-2 Years**		**Long-Term = 2-5 years**	

Town of Kortright Wellhead and Source Water Protection Plan Land Use Regulations to Minimize Potential Pollution Sources					
No.	**Strategy**	**Tasks**	**Action**	**Priority**	**Responsibility**
14	Sand filters. *Monitor quality of spring water and secure funding to install sand filters to treat spring water in the event such measures are needed to maintain water quality.*	Continue to monitor the Scotch Hill Springs and the Town's wells for the presence of potential contaminants.	Annual Inspection	Short-term	Water Superintendent
		Coordinate with County Planning Department to identify funding sources if sand filters are needed to treat spring water.	Form Committee	Immediate	Town Board Delaware County
15					
16					
17					
18					
Immediate = 1 Year		**Short-Term = 1-2 Years**	**Long-Term = 2-5 years**		

APPENDICIES

OTHER NON-REGULATORY MEASURES

The acquisition of certain lands within the Primary and Secondary Protection Areas should be considered to prevent the development of environmentally sensitive parcels of land that, if developed, would impact the source waters. Conservation easements are another strategy that could be employed by the Town of Kortright to ensure that environmentally sensitive lands in the aquifer recharge area are not disturbed by development.

Land Donation:

Landowners are sometimes in a position of being able to donate a piece of there land either to the community or a not for profit organization such as local land trusts. The initial benefit to the person donating the land comes in the elimination of estate or capital gains taxes. In addition, real estate taxes, insurance and maintenance cost are avoided. The entire value of the donation can be deducted, over time, from federal and, in many cases, State income tax obligations.

Conservation Easements:

An easement is a limited right to use or restrict land owned by someone else. Easements are either positive (rights-of-way) or negative (conservation, scenic) and may take a variety of forms. Easements can effectively assist a community in protecting land from development by restricting all or a portion of the property to open space or limited development uses. It is recommended that the Town Board *support efforts by property owners to participate in the Conservation Tax Credit (CTC) Program.* The New York State legislature passed the CTC in 2006 that gives landowners whose land is restricted by a permanent conservation easement an annual rebate of 25% of the property taxes paid on that land, up to $5,000 per year. This credit is available to all owners of easement-restricted land regardless of when the easement was created, provided that the easement was wholly or partially donated to a land trust or governmental agency. The CTC does not reduce local property taxes. The landowner pays their normal taxes to the Town and receives a rebate from the State.

Water Quality Monitoring:

Continue to monitor the quality of the water that is drawn from the Scotch Hill Springs and the Town's well fields. On-going monitoring can be used to measure the effectiveness of the proposed water quality protection measures or used as an early warning of potential threats to groundwater quality.

Road Salt Management: The Town of Kortright should coordinate with the Delaware County to explore the feasibility of establishing a *low-salt zone* in the vicinity of the Town's well field. It is recognized that there may be practical limitations to this recommendation but it should be explored.