TOWN OF NEW LEBANON

Drinking Water Source Protection Program (DWSP2) Plan

Technical Assistance Provided By:
New York Rural Water Association

Revised: January 2024

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LIST OF ACRONYMS

ARPA	American Rescue Plan Act
CAC	Conservation Advisory Council (New Lebanon)
CWS	Community Water System
BEDC	Business & Economic Development Committee (New Lebanon)
DWSP2	Drinking Water Source Protection Program
FHA	Federal Housing Administration
GPM	Gallons per minute
IWS	Individual Water Supply
MCL	Maximum Contaminant Level
CAC	Conservation Advisory Council (New Lebanon)
NCWS	Non-Community Water System
NTNCWS	Non-Transient, Non-Community Water System
NYRWA	New York Rural Water Association
NYS DEC	New York State Department of Environmental Conservation
NYS DOH	New York State Department of Health
SWAP	Source Water Assessment Program
SWPP	Source Water Protection Plan
TNCWS	Transient, Non-Community Water System
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WQIP	Water Quality Improvement Project
WWT	Wastewater Treatment

I. INTRODUCTION

"Throughout the state's history, the population has used water for all conceivable purposes; water courses have even had considerable influence on the geography of transportation and cities. Only fairly recently though have there been such great concentrations of people, such high per capita consumption of water, and such great per capita demand for waste disposal."

-Aurthur R. Eschner

A. History of today's Source Water Protection Efforts

The history of our current ground water protection efforts began in part with the 1974 Safe Drinking Water Act (SDWA). With the intent to protect the quality of underground drinking water supplies, this Act included two key provisions: designation of sole source aquifers and an underground injection control program. A 1986 amendment to this Act required that States adopt programs to "protect wellhead areas within their jurisdiction from contaminants which may have any adverse effects on the health of persons".

In 1991, National Rural Water Association developed an EPA grant-funded ground water program, which provided technical assistance to small rural water systems in the development of wellhead protection plans. Following further amendments to the SDWA in 1996, NYS was required to develop and implement a Source Water Assessment Program (SWAP). The initial NYS SWAP assessments for communities were conducted by the NYS DOH, from about 1999-2004; they delineated source water assessment areas, identified regulated contaminants within those areas and developed susceptibility analyses for public water systems.

National Rural Water Association has continued this work since 2004. Today's "Grassroots" Source Water Protection Program (SWPP) is a joint project with the U.S. Department of Agriculture (USDA) Farm Service Agency (FSA) and the National Rural Water Association (NRWA), a non-profit water and wastewater utility membership organization. The SWPP is designed to help prevent pollution of surface and ground water used as the primary source of drinking water by rural residents. Through the SWPP, New York Rural Water Association provides technical assistance for small, rural communities in development of Source Water Protection Plans to help promote clean source water and prevent source water pollution.

B. DWSP2

Recently, New York State has prioritized updating the original SWAP assessments. This has led to the development of the Drinking Water Source Protection Program (DWSP2). The program is designed to engage community stakeholders to define priority drinking water issues, potential solutions and implementation steps. A local Plan Management Team is designated to help ensure that protection of the drinking water supply remains a focus of community decisions and actions.

A long-standing collaborative relationship exists between NYS and NYRWA. In this spirit, New York Rural Water Association provides technical assistance for communities who wish to participate in the DWSP2. Development of a community's SWPP is closely aligned with the DWSP2 framework and NYRWA guides and facilitates the NYS DWSP2 certification process to the greatest extent practicable.

C. NEW LEBANON'S DWSP2

New York Rural Water Association has been working with the Town of New Lebanon, NY on Source Water Protection since 2017 and has recently developed this DWSP2 Plan. The DWSP2 Framework entails developing a Plan narrative with a companion set of summary tables to be included. This New Lebanon DSWP2 presents the summary tables in appropriate narrative locations throughout the following text, as well as in Appendix A.

The DWSP2 Framework tables are:

1.1 Form a Stakeholder Group
1.2 Establish Goals and Formulate a Vision
2.1 Develop an Overview of the Water System
2.2 Prepare a Drinking Water Source Protection Map
2.3 Create a Potential Contaminant Source Inventory
3.1 Identify Protection and Management Methods
3.2 Develop an Implementation Timeline
4.1 Designate a Plan Management Team

II. THE PLAN

The following Plan was developed to help protect the drinking water resources of the Town of New Lebanon, NY.

A. FOUNDATIONS

For the purposes of this Plan, 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.

In July 2017, the Town Board of the Town of New Lebanon passed a resolution that approved the development and implementation of this Source Water Protection Plan (Plan). It also authorized a stakeholder group to work with New York Rural Water Association (NYRWA) on this Plan. In September of 2023, the Town passed a resolution that approved this Plan contingent on NYS DWSP2 approval.

1. **Planning Team**

A planning team (stakeholder group) was authorized to include Conservation Advisory Council (CAC) members, a Zoning Board of Appeals Member, a Town Board Member & Zoning Re-Write Committee Member, and the New Lebanon representative to the Columbia County Environmental Management Council. These individuals have met with NYRWA and provided community-specific guidance on the source water planning process.

The names of the stakeholder group members, along with their contact information and affiliations, are provided in the following DWSP2 Summary Table.

DWSP2 Summary Table:
1.1 Form a Stakeholder Group

1.1 Form a Stakeholder Group		
List the Stakeholder Group names, contact information and relevant affiliation(s)		
Name	**Contact Information**	
	Email	**Relevant Affiliation(s)**
Peg Munves	nlcac.munves@gmail.com	New Lebanon Conservation Advisory Council, Co-Chair; Water Source Protection Committee, Co-Chair; Environmentalist; Agriculturalist.
Bob Gilson	nlcac.gilson@gmail.com	Climate Smart Task Force, Member; New Lebanon Conservation Advisory Council, Member; Conservationist.
Steve Powers	nlcac.powers@gmail.com	Climate Smart Task Force, Chair; CAC, Member; Zoning Rewrite Committee, Member; New Lebanon Town Board Member.
Donald Lamonaca	nlcac.lamonaca@gmail.com	New Lebanon CAC; New Lebanon Zoning Rewrite Committee; Corkscrew Rail Trail committee; finance expertise; outdoorsman and conservationist.
Tyler Fogg	nlcac.fogg@gmail.com	Berkshire Natural Resources Council, Trails Manager; New Lebanon CAC, member
William O'Neill	baghouse101@gmail.com	Retired Attorny; New Lebanon CAC member; Naturalist and Conservationist.
Bruce Shenker	bshenker@gmail.com	New Lebanon Conservation Advisory Council, Member; Columbia County Environmental Management Council, NL Representative

1.1 Form a Stakeholder Group (continued)

List the meeting dates and summaries of topics covered at stakeholder meetings below	
Date	**Topic(s) Covered**
6/13/2022	Plan summary presentation
10/2/2017	Protection workshop and presentation
9/10/2018	Provided a progress update, including a summary of water well survey and compilation of hydrogeologic data
12/9/2019	Provided a progress update
3/12/2020	Mapping review
11/12/2020	NYSDOH well sampling meeting
6/13/2022	Plan summary presentation
9/12/2022	Final plan presentation
6/1/2023	Plan meeting.
8/25/2023	Implementation planning meeting
9/12/2023	Town Board approved Revised Plan contingent on DWSP2 approval.
1/8/2024	Stakeholder Plan meeting, implementation and DWSP2 review.

2. Goals and Vision

One of the first actions of the stakeholder group was to decide on the goals and vision for the Plan. The goals of the source water protection plan in New Lebanon are to (1) identify water supply resources and potential threats now and in the future and (2) recommend and implement protection strategies to protect the identified water resources.

From the 2017 Town Board resolution, the vision of the source water protection plan is to

> *"seek to further develop its water resources planning and management strategies in order to protect drinking water resources".*

DWSP2 Summary Table:
1.2 Establish Goals and Formulate a Vision

1.2 Establish Goals and Formulate a Vision		
Provide the community's vision for the source water protection plan in the space below:	List community-specific goals for your source water protection plan below:	
Vision Statement		
Seek to further develop New Lebanon's water resources planning and management strategies in order to protect drinking water resources.	**Goal**	Continually identify the current status of water supply resources and potential threats.
	Goal	Recommend and implement protection strategies on an ongoing basis in order to protect water resources.

B. WATER SYSTEM INFORMATION

1. Overview

This Plan aims to protect the drinking water sources located in New Lebanon for the residents and businesses of the Town. This includes several privately-owned public water systems as well as individual (residential) water supply (IWS) wells. including privately-owned public water systems, commercial establishments, and individual, residential water supply (IWS) wells.

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

2. Public Water Systems in New Lebanon

The United States Environmental Protection Agency (USEPA) defines a public water system as providing water for human consumption through pipes or other constructed conveyances to at least 15 service connections or which serves an average of at least 25 people for at least 60 days a year. The New York State Department of Health (NYS DOH) has a broader definition of a public water system that includes any system with at least 5 service connections. A community water system (CWS) is a public water system that serves the same people year-round. In contrast, a non-community water system is a public water system that does not serve the same people year-round. There are 2 types of non-community water systems. A non-transient, non-community water system (NTNCWS) regularly supplies water to at least 25 of the same people at least 6 months per year. A transient, non-community water system does not regularly serve the same people. Public water systems with sources in New Lebanon are indicated in Table 1.

PWS_ID_NUMBER	PWS_NAME	PWS_NYS	SYSTEM_POP	PRIMARY_SOURCE	GPM	Depth(ft)	Casing(ft)	Treatment
NY1030201	ABODE OF THE MESSAGE	NCWS	40	GW	15	275		UV
NY1006328	ADAMS CROSSING MOBILE HOME PARK	CWS	70	GW	20	116		Chlorination
NY1030207	BLUEBERRY HILL MARKET CAFE	NCWS	36	GW	6	600	127	Waiver
NY1018245	BUCKYS BAGELS (VALLEY PLAZA)	NCWS	25	GW				Waiver
NY1030007	CHINA CITY (SHAKER MILL PROPERTY II LLC)	NCWS	25	GW				
NY1002628	DARROW SCHOOL	CWS	150	Spring				Chlorination
NY1030279	DARROW SCHOOL NORTH FAMILY WELL	CWS	30	GW	15	285		Chlorination
NY1018170	GALLUP INN	NCWS	75	GW		43		Waiver
NY1010864	HANSONS TRAILER PARK- NEW LEBANON	CWS	22	GW	50	155	90	Waiver
NY1006444	JIMMY DS PIZZA ROYALE & REST.	NCWS	106	GW				Waiver
NY1015329	LEBANON VALLEY CONCESSIONAIRES	NCWS	250	GW		40	40	Waiver
NY1030205	MOUNTAIN ROAD CAMP	NTNCWS	35	GW		130	130	UV
NY1002630	NEW LEBANON ELEMENTARY SCHOOL	NTNCWS	350	GW		68		Chlorination
NY1002629	NEW LEBANON HIGH SCHOOL	NTNCWS	375	GW		80	65	Chlorination
NY1030309	SHAKER MEADOWS MOBILE HOME PARK	CWS	24	GW		402	74	UV
NY1010866	SHERMANS TRAILER PARK	CWS	21	GW				Waiver
NY1006329	SKI LODGE TRAILER PARK	CWS	88	GW		62		Waiver
NY1030061	SMITTYS PUB	NCWS	25	GW		47	47	Waiver
NY1030122	STEWARTS SHOP #168 NEW LEBANON	NCWS	31	GW	8			UV
NY1010865	TAZMUTT, INC. (SHAKER FLATS MHP)	CWS	69	GW				Chlorination
NY1012354	THE INN @ SHAKER MILL FARM	NCWS	25	GW	5	350	200	UV
NY1019971	THE KSHACK	NCWS	30	GW				

Table 1. Drinking Water Systems in New Lebanon

Approximately 200 Town residents (this count does not include boarding students at the Darrow School) are supplied with drinking water from Community Water Systems. This represents about 10 percent of the Town's population. The remaining Town population are thus supplied by individual (residential) water supply (IWS) wells.

Maps showing the location of public drinking water systems supplying water for residents and businesses across New Lebanon are shown in Figures 1 and 2. All drinking water systems in New Lebanon are supplied by groundwater.

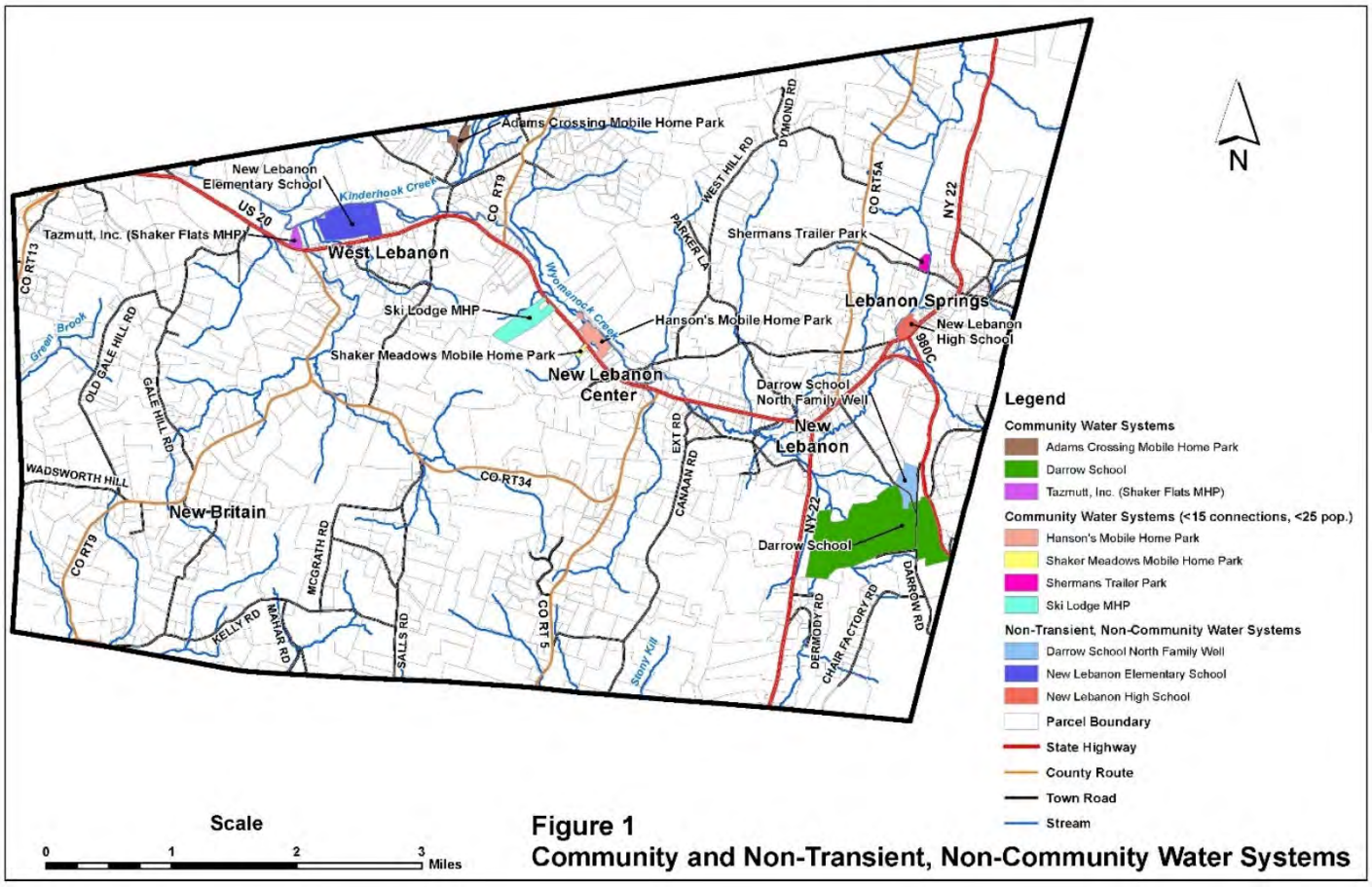
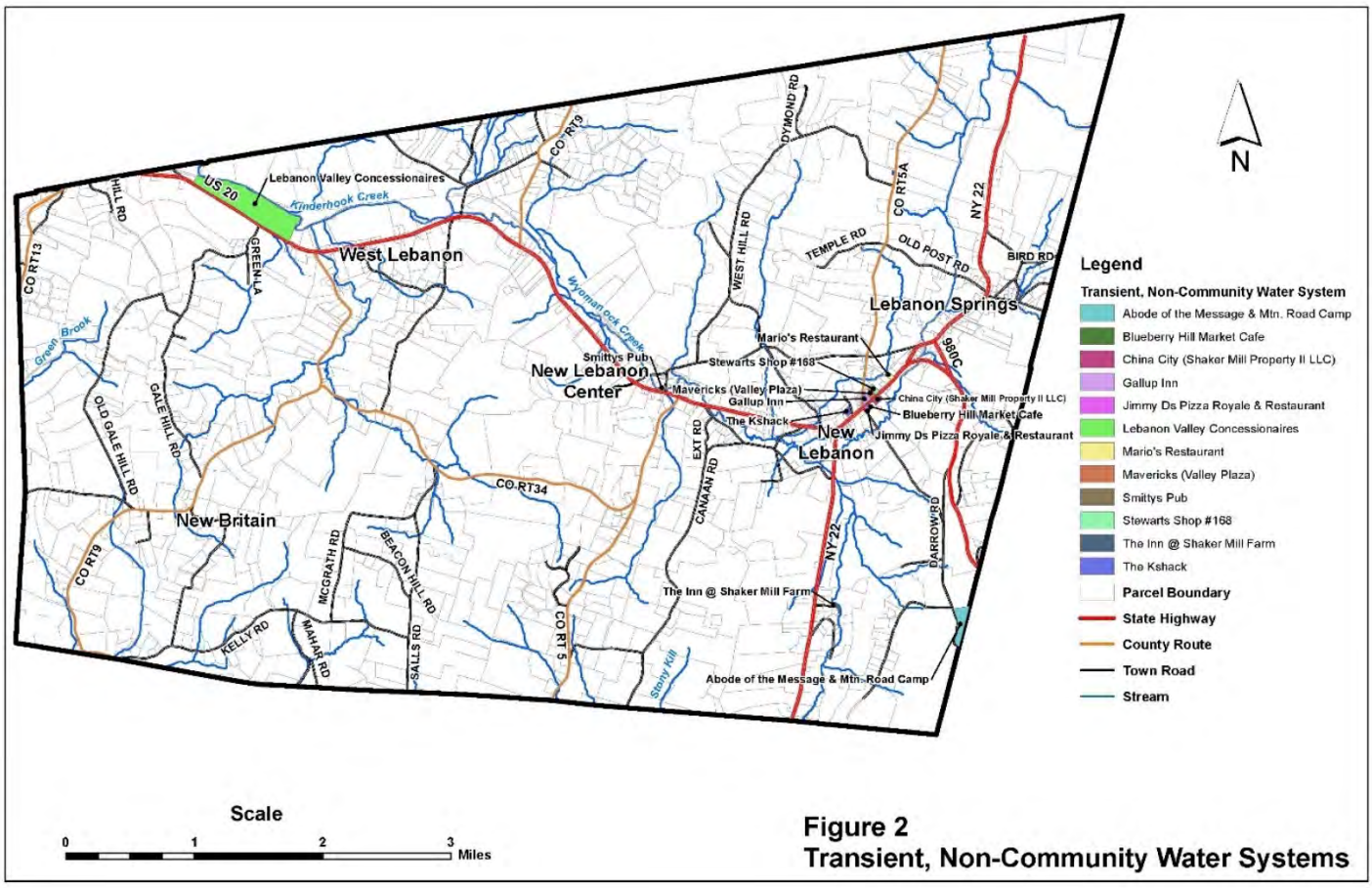


Figure 1
Community and Non-Transient, Non-Community Water Systems

NOTE: A full-sized map (scaled for 11”x17”), of this representational image is provided in Appendix B

There are 5 mobile home parks and 2 residential institutions that have their own source of water and operate as Community Water Systems in New Lebanon (see Figure 1 and Table 1). All of these systems rely upon wells for their source of supply. There are 2 non-transient, non-community water systems. NYRWA has compiled data on the supply wells for these types of systems from the Columbia County Department of Health and other sources such as the United States Geological Survey (USGS) and the NYSDEC. Table 2 is the resulting data compilation. Data on these wells, particularly those that are older, is frequently incomplete. Water quality is summarized in Table 2 as well. Nitrate levels are low, with no levels above the level that result in accelerated sampling (5 mg/L). Recent sampling for emerging contaminants (PFOA, PFOS, and 1,4-Dioxane) at the community water systems that serve 25 or more people as well as at the non-transient, non-community water systems revealed levels below detectable limits except at the New Lebanon High School. Here, levels of PFOA/PFOS have been in the range of 4.4 to 11 ng/L (the Maximum Contaminant Level, MCL, is 10 ng/L for each).



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System	Well	Depth	Casing	Aquifer	Yield	Water Quality
ADAMS CROSSING MOBILE HOME PARK	#1	116		Walloomsac Formation (?)	20	Nitrate - <0.01
ADAMS CROSSING MOBILE HOME PARK	#2			Walloomsac Formation (?)	12	Nitrate - <0.01
DARROW SCHOOL	#1	132		Austerlitz/Nassau Phylite	15	Nitrate - 1.4; Cl = 198; TDS = 688; Hardness = 211
DARROW SCHOOL	#2	338		Austerlitz/Nassau Phylite	10	
DARROW SCHOOL	#3	205	39	Austerlitz/Nassau Phylite	21	Nitrate - 2.2; Cl = 232; TDS = 711; Hardness = 409
DARROW SCHOOL NORTH FAMILY WELL	#1	285		Austerlitz/Nassau Phylite	15	Nitate - 0.4
HANSON'S MOBILE HOME PARK	#1	98	98	Unconsolidated (?)	60	
SHAKER MEADOWS MOBILE HOME PARK	#1					
SHERMANS TRAILER PARK	#1					Nitrate - 0.13 to 0.15
SKI LODGE MHP	#1	62		Unconsolidated (?)		Nitrate - 0.2
TAZMUTT, INC.	#1	79	73	Walloomsac Formation (?)	20	Nitrate - 0.15
NEW LEBANON ELEMENTARY SCHOOL	#1	68				Nitrate - 0.2
NEW LEBANON HIGH SCHOOL	#1	80	65	Stockbridge Formation		Nitrate - 2 to 2.7

Table 2. Public Drinking Water System Well Data

DWSP2 Summary Table:
2.1 Develop an Overview of the Water System

2.1 Develop an Overview of the Water System			
Fill in the water system overview table below:			
Water system name:	See Table 1 and Figures 1 & 2 of plan		
NYS PWS ID:	PWSID#s and details for 22 Systems are compiled Table 1 of the Plan.		
Type of water system (e.g. community, non-community, transient, non-transient):	CWS, NTNCWS, and TNCS		
Name of the community, or communities, served by the system:	22 Drinking water systems in the Town of New Lebanon, as litsed in Table 1.		
Population served by the system:	Approximately 1982 total people served by all systems types.		
# of service connections:	Insufficient available service connection data.		
Summary of wells, intakes, infiltration galleries, and/or springs including name, depth, screen length and pumping rates where applicable:	Available information has been gathered from Columbia County DOH records; details are presented in Table 2 of this Plan.		
General treatment information:	Most Community Water Systems rely upon chlorination for disinfection. Some smaller transient, non-community water systems have waivers from disinfection or utilize UV disinfection.		
Summary of hydrogeographic setting of drinking water sources including watershed information and/or type of aquifer and aquifer materials (this information may be gathered after delineating protection areas in section 2.2):	Drinking water system wells are found in unconsolidated and bedrock aquifers throughout the Town and in the Tackawasick Creek-Kinderhook Creek, Black River-Kinderhook Creek and Wyomanock Creek HUC 12 watersheds. Further details in Section 3.2 of plan		
Water quality summary including any known ambient water quality information, finished water detections, and/or history of maximum contaminant level (MCL) violations*:	Available data for New Lebanon's 22 drinking water systems is compiled in Table 2 of the Plan.		
Water quantity summary:	Current Water Withdrawal Permit Expiration Date(s)	N/A	
	Total Permitted Water Withdrawal Capacity	N/A	MGD
	Average Daily Water Demand (= Yearly Usage / 365)	N/A	MGD
	Maximum Daily Water Demand (Unofficial 3-day average in peak month - e.g. July)	N/A	MGD
	Daily Water Losses (can be obtained from Water Conservation Program form)	N/A	MGD

3. Individual Water Supply (IWS) Wells

As indicated above, most households in New Lebanon rely upon individual private water supply wells. These wells range widely in age and construction. In a 2017 survey that NYRWA conducted of homeowners with IWS wells in New Lebanon, 71 percent indicated that their well was drilled prior the year 2000. Fifteen percent of respondents did not know when their well was drilled.

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.

NYRWA obtained the Water Well Completion Reports for wells drilled in New Lebanon as well as the corresponding data in Geographic Information (GIS) format. Other sources of well data included LaFleur and DeSimone (1991) and the United States Geological Survey (USGS). Based upon the compiled data, 86% of water wells drilled in New Lebanon since 2000 have been completed in bedrock. Bedrock wells in New Lebanon have a median depth of 325 feet and a median yield of 5 gallons per minute (gpm). Note that the median value is the one lying at the midpoint of the observed values (one-half fall above it and one-half fall below it).

Nearly one-third (32%) of bedrock wells have yields less than the 5 gpm required by the Federal Housing Administration (FHA) for new construction home loans. Fifteen percent of bedrock wells yield less than the 3 gpm required by FHA for new home loans. A discussion of bedrock water well characteristics based upon the bedrock formation follows below.

In contrast, the median depth of wells completed in unconsolidated deposits (the material above bedrock) is 55 feet and the median yield is 20 gpm. No wells finished in unconsolidated deposits yield less than 5 gpm. More information on unconsolidated aquifers is discussed below.

Although NYSDEC water well completion reports are required to be submitted, water quality testing of IWS wells is not mandated by state or local regulations. From the 2017 NYRWA water well survey, 79 percent of respondents indicated water quality issues. Hardness, iron, and sediment were among the numerous issues (see Figure 3 below). Fifteen percent of residents indicated that their well had tested positive for coliform bacteria.

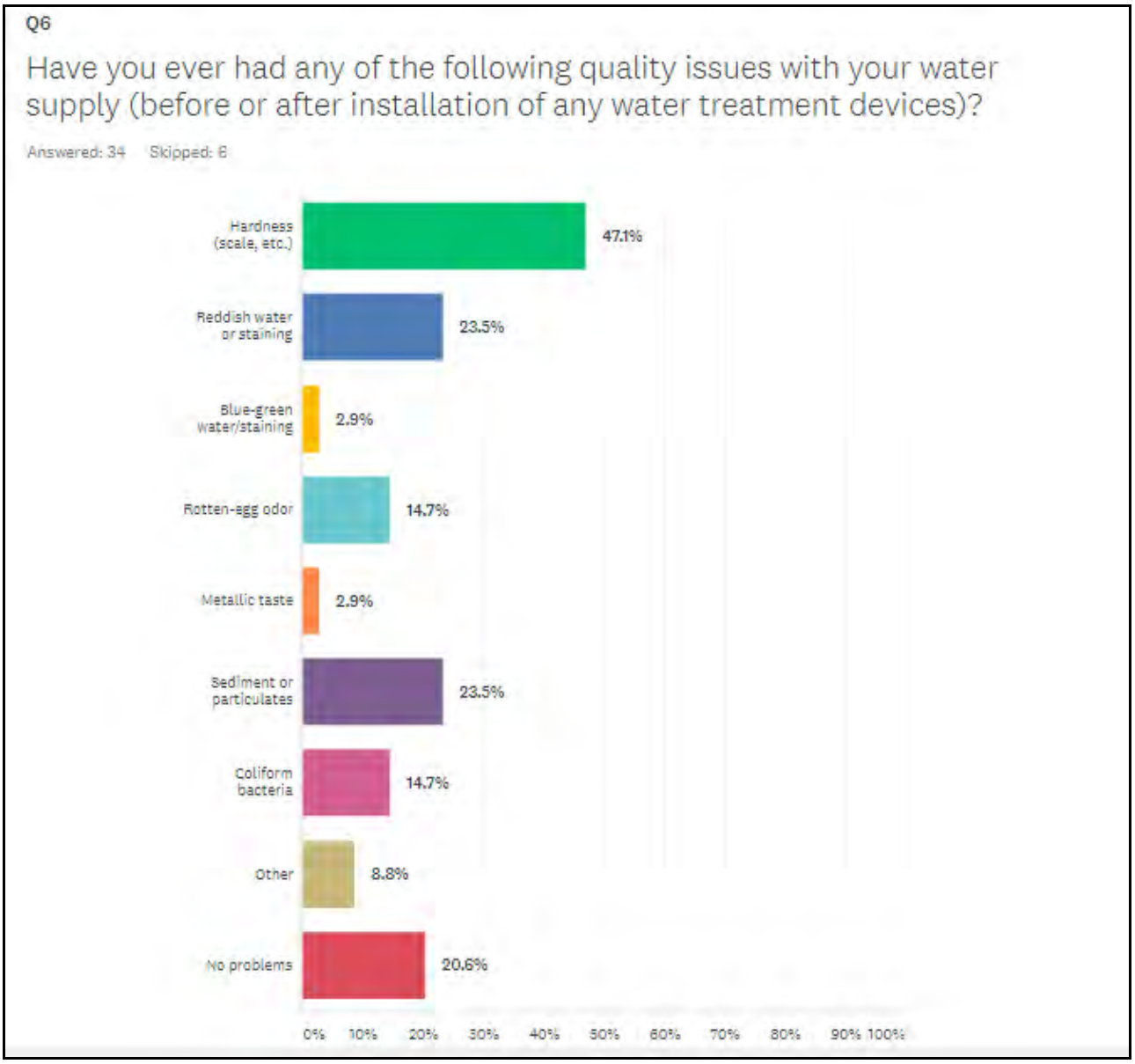


Figure 3. Self-Reported Drinking Water Quality Issues

The NYSDOH Bureau of Water Supply Protection sampled 21 IWS wells in April 2021 for various constituents including coliform bacteria, color, turbidity, odor, pH, conductivity, hardness, nitrate, iron, manganese, chloride, sulfate, sodium, fluoride, arsenic, and lead (known collectively as the routine physical and chemical group). Sixteen of the 21 wells (76 percent) had water which would be classified as hard (a level of hardness above 60 mg/L). Of these, 43 percent have water characterized as moderately to very hard which would typically necessitate a softener to control scale deposition. From the well survey, only 29 percent of residents utilize a softener.

Iron and manganese are also commonly found in New Lebanon well water. Some 29 percent of wells tested had iron above the maximum contaminant level of 0.3 mg/L and 14 percent had manganese above the maximum contaminant level of 0.3 mg/L. Three of the wells tested positive for total coliform bacteria. Of these, only 1 tested positive for E. coli bacteria. Further discussion of the results of the NYSDOH well sampling is contained in the Hydrogeologic Setting Section below.

C. HYDROGEOLOGIC SETTING

1. Topography and Drainage

New Lebanon lies almost entirely within the Taconic section of the New England physiographic province (Fenneman and Johnson, 1946). The western most portion of New Lebanon (west of Old Gale Hill Road) is situated within the Hudson Valley section of the Valley and Ridge physiographic province. Note that the Natural Resource Conservation Plan for the Town of New Lebanon (2017) divided New Lebanon into 4 conservation areas based on topography, geology, and natural resource features. These are the High Taconics, the Wyomanock and Kinderhook Valleys, the Rocky Foothills, and the Western Hills (see Figure 4).

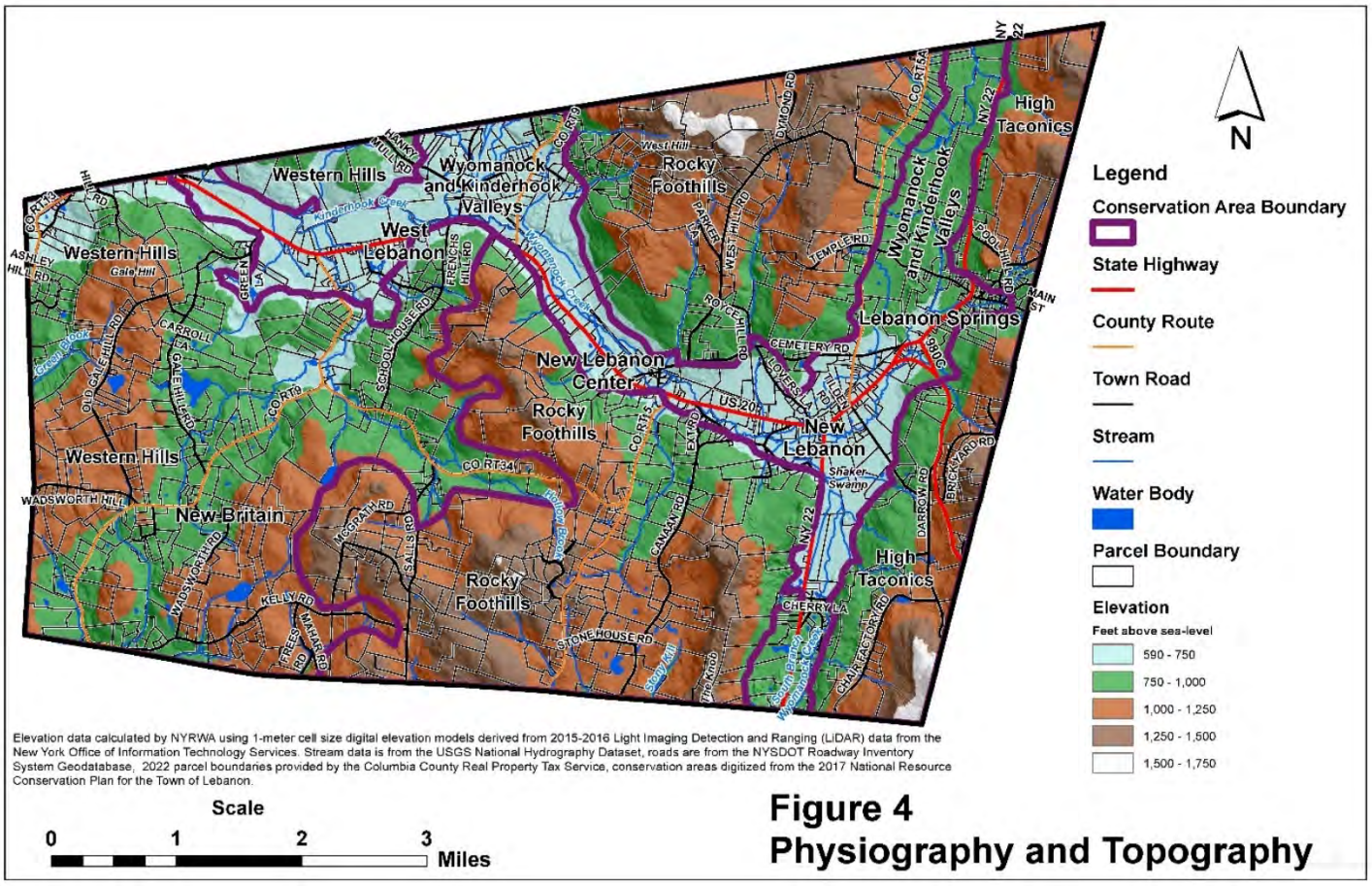


Figure 4
Physiography and Topography

NOTE: A full-sized map (scaled for 11”x17”), of this representational image is provided in Appendix B

Elevations in New Lebanon range from lows of 590 to 850 feet in the Wyomanock and Kinderhook Valleys to summit elevations of 1,500 to 1,700 feet above sea-level in the Rocky Foothills and High Taconics (Figure 4).

Slopes range widely across New Lebanon, averaging 25 percent (Figure 5). Overall, just over one-quarter of the land area of New Lebanon has slopes less than 15 percent. Note that slopes of greater than 15 percent are not considered acceptable for septic systems (NYSDOH – Appendix 75A). The lowest slopes are generally found in the Wyomanock and Kinderhook Valleys and in some upland valley areas. Steepest slopes are found in the upland areas of Town (High Taconics, the Rocky Foothills, and the Western Hills) (see Figure 5).

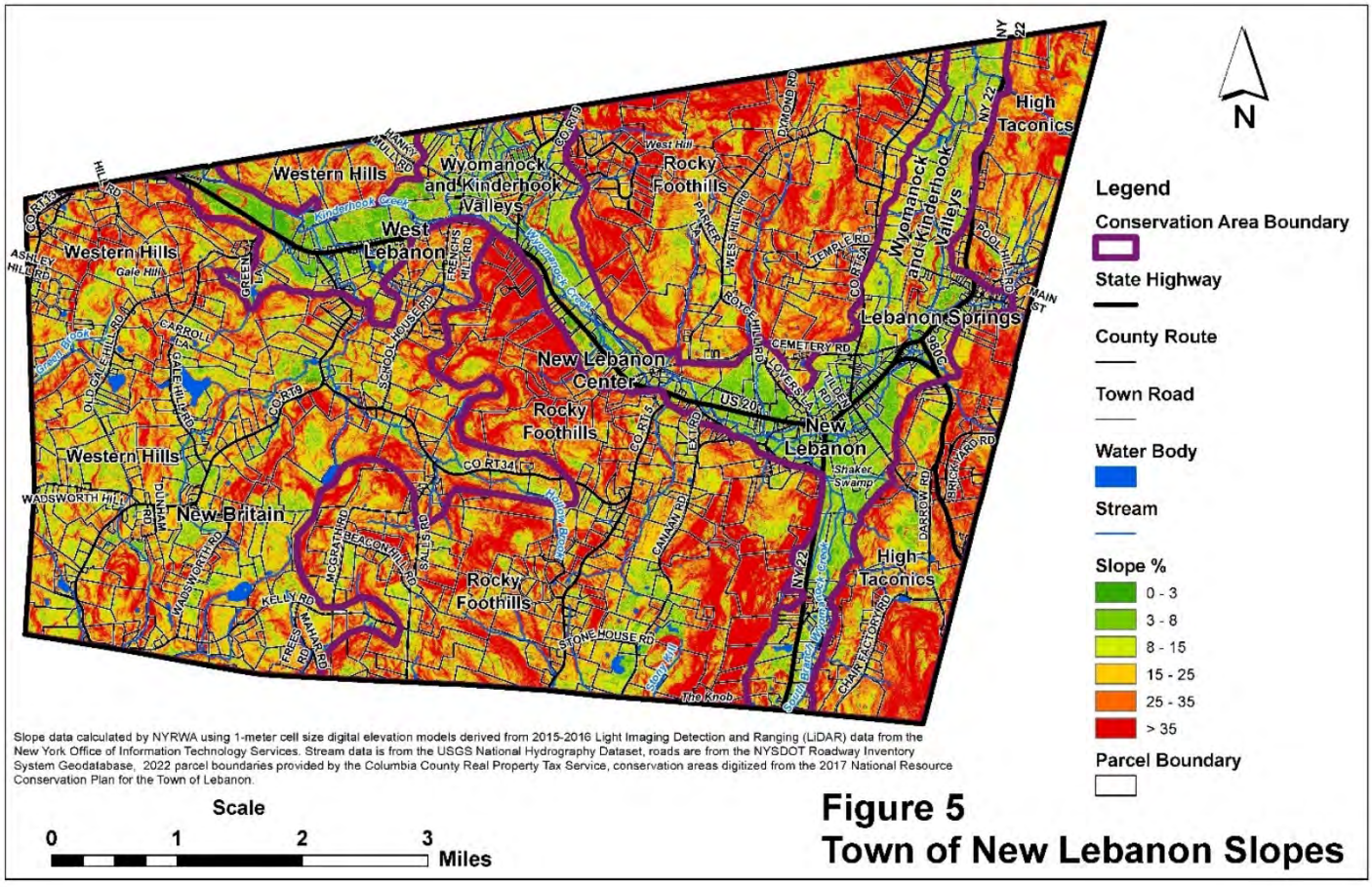
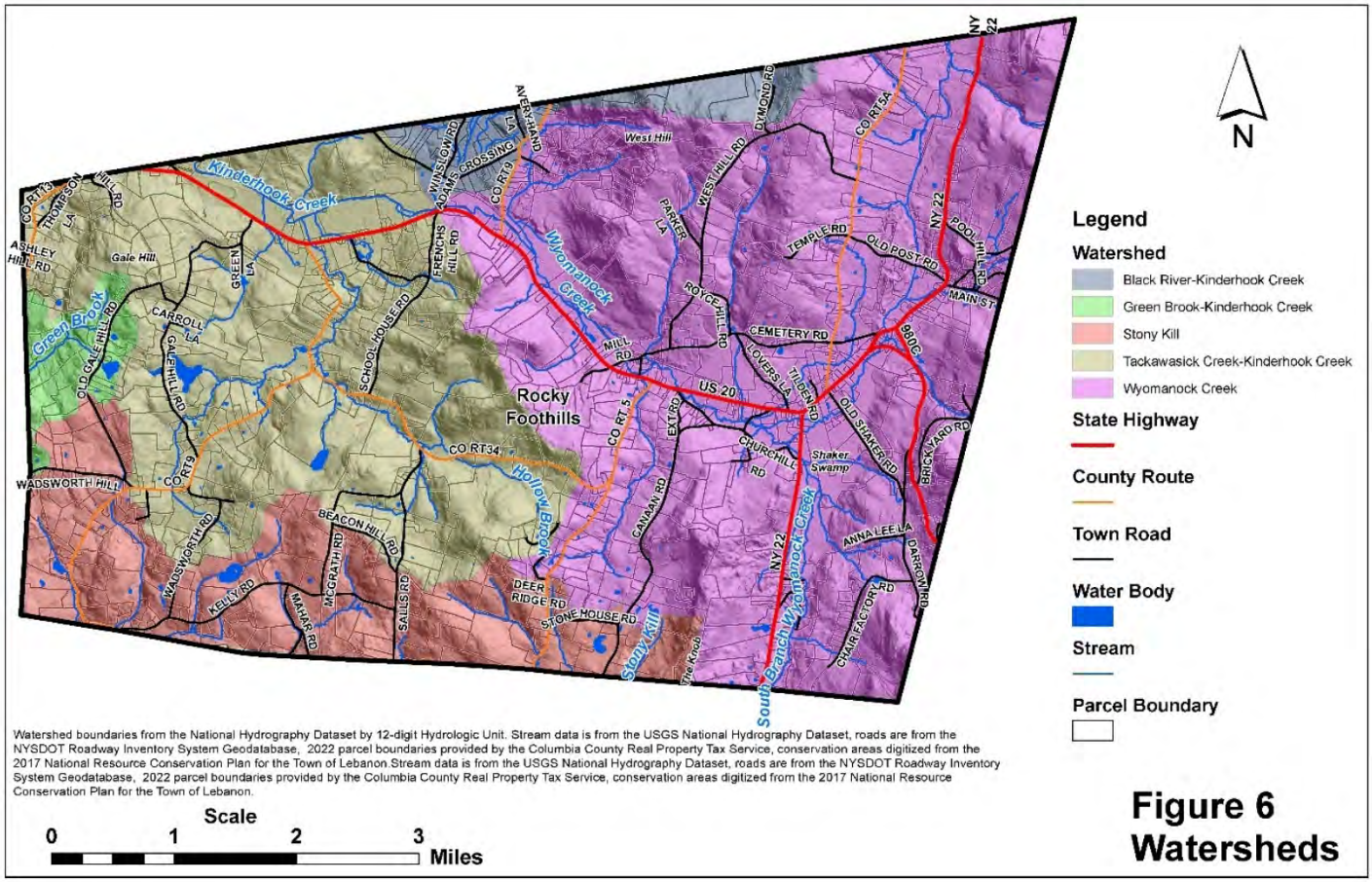


Figure 5
Town of New Lebanon Slopes

NOTE: A full-sized map (scaled for 11”x17”), of this representational image is provided in Appendix B

All land areas of New Lebanon drain to Kinderhook Creek and its tributaries. Approximately one-half of the Town drains to Wyomanock Creek, including the South Branch Wyomanock Creek (Figure 6). Other areas drain directly to Kinderhook Creek or to other tributaries such as the Black River, Green Brook, Hollow Brook, Stony Kill, and Tackawasick Creek (Figure 6). In terms of the lengths of stream and rivers in New Lebanon, the Wyomanock Creek totals 8.9 miles, Hollow Brook 4.7 miles, Kinderhook Creek 3.5 miles, South Branch Wyomanock Creek 2.4 miles, Green Brook 1.2 miles, and the Stony Kill 0.6 miles.



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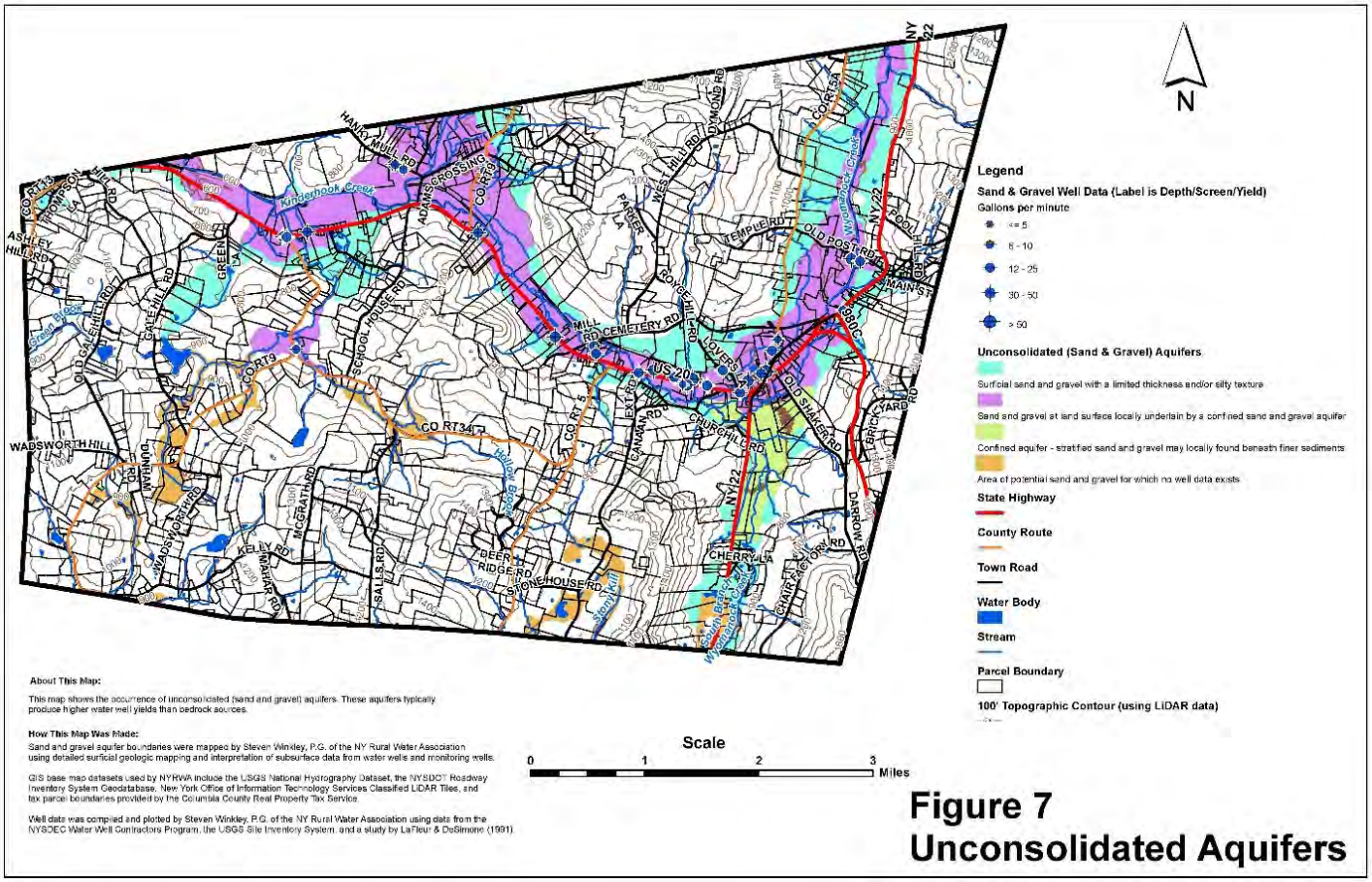
2. Unconsolidated Aquifers

Steven Winkley, P.G. of NYRWA mapped the unconsolidated (sand and gravel) aquifers of New Lebanon at a 1:24,000-scale (see Figure 7). Aquifer boundaries were digitally mapped using the following: the interpretation of topographic expression from 1-meter cell size digital elevation models derived from 2015-2016 Light Imaging Detection and Ranging (LiDAR) data, field observations, subsurface data from water wells and test borings, and georeferencing and review of unpublished mapping by LaFleur and DeSimone (1991) in a report entitled Water Resources of New Lebanon, NY.



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Four classifications of unconsolidated aquifers were mapped by NYRWA (Figure 7). The first are areas where sand and gravel found at or near the land surface has either a limited saturated thickness and/or a silty texture. Such sand and gravel aquifers often occur along the edges of the Wyomanock and Kinderhook Valleys in geological features known as alluvial fans or kame terraces. Less than 10 percent of sand and gravel wells occur in this type of aquifer, with well

depths ranging from 35 to 45 feet and yields from 5 to 15 gpm. In many instances there is insufficient saturated thickness to produce a usable well in such areas. However, these areas provide recharge to the underlying bedrock aquifer and provide groundwater to help sustain streams and wetlands.

The second mapped classification of sand and gravel aquifers in New Lebanon are areas where sand and gravel deposits are found at or near the land surface and there could also be an underlying deeper, confined aquifer. This lower aquifer, ranging in depth from 40 to 145 feet, is confined by glacial lake silt and clay that was deposited across the Wyomanock and Kinderhook Valleys as well as a few upland valleys such as that of Hollow Brook. Some wells in these confined aquifers naturally flow due to artesian pressure. Reported well yields in the confined aquifers range from 5 to 50 gpm, with a median yield of 20 gpm. Most of these wells produce from open-ended casing. Significantly higher yields are possible in wells constructed with a developed screen. The deepest portion of the confined aquifer is found near the confluence of the Kinderhook and Wyomanock Creeks. Here a significant delta was built into the glacial lake that occupied the valley.

The surficial sand and gravel aquifer deposits across the Kinderhook and Wyomanock Creek Valleys can produce reported well yields of 25 to 125 gpm in wells ranging from 6 to 38 feet depth. Some residences along Shaker Road and West Street near New Lebanon hamlet have driven or dug wells that are believed to be completed in the upper (surficial) sand and gravel aquifer. Due to the shallow nature of these productive valley-bottom deposits, such wells are more vulnerable to flooding and surface forms of contamination (septic systems, road runoff, spills, etc.).

The 2 other aquifer classifications are: confined aquifers where confined sand and gravel may be found beneath finer sediments and areas of potential sand and gravel for which no well data exists to indicate saturated thickness. The confined aquifer areas are where extensive fine-grained wetland deposits exist at the land surface found in the South Branch Wyomanock Creek valley. This includes Shaker Swamp. Unfortunately, no data exists on the extent of confined sand and gravel in these areas. Areas mapped as potential sand and gravel for which no well data exists are largely upland tributary valleys with surficial deposits of alluvium (modern stream deposits). No well data exists in these areas either. Alluvium can produce usable quantities of water to wells, but such deposits are susceptible to contamination due to their shallow nature and position in flood prone areas.

The NYSDOH Bureau of Water Supply Protection sampled 6 wells likely to be completed in unconsolidated deposits. The median level of conductivity, a measure of the dissolved solids in the water, was relatively low in these wells: 88.4 µmhos/cm. Water in these wells was also soft, at a median of 32 mg/L. Water from unconsolidated aquifers is high in iron though, at a median concentration of 0.37 mg/L, above the maximum contaminant level of 0.3 mg/L. Four of the 6 wells had iron levels above 0.3 mg/L. Two of the 3 wells that tested positive for total coliform bacteria are completed within unconsolidated aquifers.

3. Bedrock

The High Taconics, Rocky Foothills, and Western Hills upland regions in New Lebanon (Figure 4) are covered by a varying thickness of an unsorted mixture of clay, silt, sand, gravel, cobbles, and boulders known as glacial till. In some places in these regions of Town, bedrock outcrops at the land surface. Based upon water well data, the median depth to bedrock across these three uplands region in New Lebanon is 26 feet. Virtually all wells (99%) in the upland regions of New Lebanon are completed in bedrock. In the Wyomanock and Kinderhook Valleys, nearly two-thirds (65%) of wells are also completed in bedrock. In the valleys, the depth to bedrock is greater at a median depth of 68 feet. Most bedrock wells across the Wyomanock and Kinderhook Valleys are confined by glaciolacustrine silt and clay and/or glacial till.

There are 4 bedrock formations occurring throughout New Lebanon that are sources of drinking water (see Figure 8). The distribution of bedrock formations in New Lebanon was compiled by Steven Winkley of NYRWA using GIS. Several different published and unpublished mapping sources were digitized and utilized in this effort.

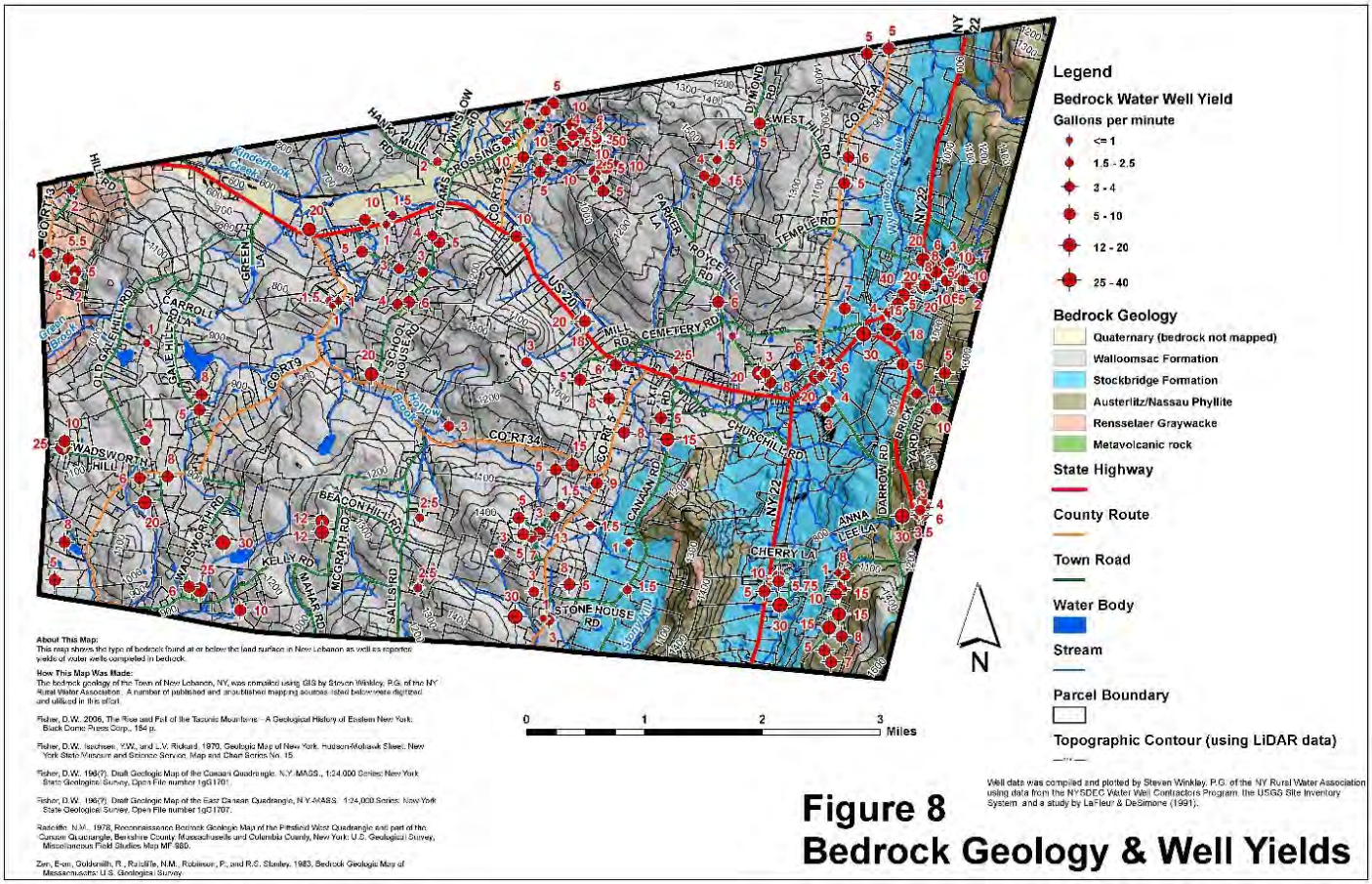

Figure 8
Bedrock Geology & Well Yields

NOTE: A full-sized map (scaled for 11”x17”), of this representational image is provided in Appendix B

New Lebanon's bedrock geology is the result of ancient geologic history that occurred between 550 and 460 million years ago. Initially, the area was covered by a shallow sea and marine sediments were deposited on the floor of this ocean. Eventually, these deposits were consolidated into limestone and dolostone. In many areas, the limestone and dolostone were exposed to heat and/or pressure and were metamorphosed to a more crystalline rock known as marble. Collectively these are called carbonate rocks since they are composed chiefly of the mineral calcium carbonate. Such rocks can be dissolved by soil water and groundwater to form karst features such as sinkholes, caves, etc. The rock formation that resulted from the sediments of this period is known as the Stockbridge Formation. In New Lebanon it is found chiefly beneath portions of the valleys occupied by the Stony Kill and Wyomanock Creek (Figure 8). However, it also occurs at or near the land surface in some upland areas near the High Taconics and the Rocky Foothills (near the feature known as the Knob). The famous New Lebanon Warm Spring, the only warm spring in New York State, is situated off Spring Hill Road in Lebanon Springs at the base of the High Taconics. This unique spring issues from the Stockbridge Formation (Dunn Geosciences Co., 1981) and Hobba et. al (1979) near where the less permeable Austerlitz Formation has been thrust against the carbonate rock.

Following a period of erosion, the New Lebanon area became part of a deep ocean trench analogous to those found in today's Pacific Ocean. A thick layer of silty mud was deposited in this deep trench on top of the carbonate rocks. These sediments eventually consolidated to form shale rock and were later metamorphosed in places into slate and a higher-grade rock known as phyllite. Collectively, the gray to black shale, slate, and phyllite are referred to as the Walloomsac Formation. It is the most common bedrock formation in New Lebanon (Figure 8). The cause of the heat and pressure that caused metamorphism of the Walloomsac Formation and the Stockbridge Formation was related to a mountain building event that began to occur some 450 million years ago. At this time, the area that is today New Lebanon was at the intersection of 2 crustal plates. As these 2 plates collided, the Taconic Range was thrust upwards. As this occurred, older rocks were pushed large distances westward over the younger Walloomsac Formation and the Stockbridge Formation. The rocks that were thrusted make up slices of rock known as allochton material. The underlying rocks that originated in place are part of autochton material. In New Lebanon, a common rock of allochton material is composed of the greenish Austerlitz Phyllite and the Nassau Formation (see Figure 8). The Austerlitz and Nassau Formation have been mapped together on Figure 8. The other chief rock type found in the allochton material in New Lebanon is the Rensselaer Graywacke. This bedrock formation is composed chiefly of impure sandstone with minor amounts of shale. The boundaries between allochton and autochton rocks are marked by low angled thrust faults.

The characteristics of water wells completed in bedrock vary based upon the formation and the localized distribution of fractures. Table 4 is a summary of well characteristics based upon the geologic formation. In general, the Stockbridge Formation produces the highest yields in New Lebanon, due to fractures and other openings that have been enlarged. The lowest yields are found in the Walloomsac Formation (Table 3).

Formation	# of Wells		Well Depth Range	Median Well Depth	Casing Depth Range	Median Casing Depth	Yield Range	Median Yield	% of Wells <5 gpm	% of Wells <3 gpm
		Units	Feet	Feet	Feet	Feet	Gpm	Gpm		
Austerlitz/Nassau Phyllite	22		144 - 600	311	20 - 164	58	2 - 30	6	28.5%	4.7%
Rensselaer Graywacke	7		330 - 465	360	60 - 100	83	2 - 5.5	4.5	50.0%	33.3%
Stockbridge Formation	41		32 - 722	221	20 - 258	80	1 - 40	6	25.8%	12.9%
Walloomsac Formation	114		79 - 820	353	20 - 300	40	1 - 50	5	33.7%	16.8%

Table 3. Bedrock Well Characteristics by Formation

In terms of water quality, NYSDOH Bureau of Water Supply Protection sampling of water wells indicates that water from the Stockbridge Formation is quite hard (Table 4), as typically is the case with carbonate rock. Water in the Walloomsac Formation is softer but has more issues with iron and manganese (Table 4). Unfortunately, the NYSDOH sampling event was able to sample only 1 well in the Austerlitz/Nassau Formation. The water from this well was the most mineralized in New Lebanon and the arsenic level in this well exceeded the MCL (Table 4).

Formation	# of Wells		Conductivity Range	Hardness Range	Iron Range	Manganese Range	Iron + Manganese Range	Arsenic Range
		Units	µmhos/cm	mg/L	mg/L	mg/L	mg/L	mg/L
		MCL		120	0.3	0.3	0.5	0.01
Austerlitz/Nassau Phyllite	1		546	260	1.69	0.12	1.81	0.014
Stockbridge Formation	4		338 - 543	156 - 267	<0.01 - 0.16	<0.01 - 0.02	<0.01 - 0.18	<0.0005 - 0.0014
Walloomsac Formation	10		42 - 481	100 - 159	<0.01 - 0.77	0.01 - 2.54	0.01 - 2.6	<0.0005 - 0.0043

Red denotes value above MCL

Table 4. Bedrock Well Water Quality by Formation

D. 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 one hundred 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 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.

1. Privately-Owned Drinking Water Systems

Due to a lack of positional accuracy and the desire to maintain security, the ownership and control area has not been mapped for the various privately-owned drinking water systems in New Lebanon. Furthermore, in the absence of information on groundwater flow, pumping rates, well construction, etc., a precise contribution area cannot be delineated for these various privately-owned water system wells. Instead, a simplified drinking water source protection area of a fixed radius of up to 1 mile in all directions around the source was delineated (see Figure 9). A drinking water source protection area of 1,500 feet was drawn around each transient, non-community water system. These Source Water Areas are assumed to encompass the Critical Protection Areas and Contribution Areas for each system. These fixed radius distances are consistent with the SWAP.

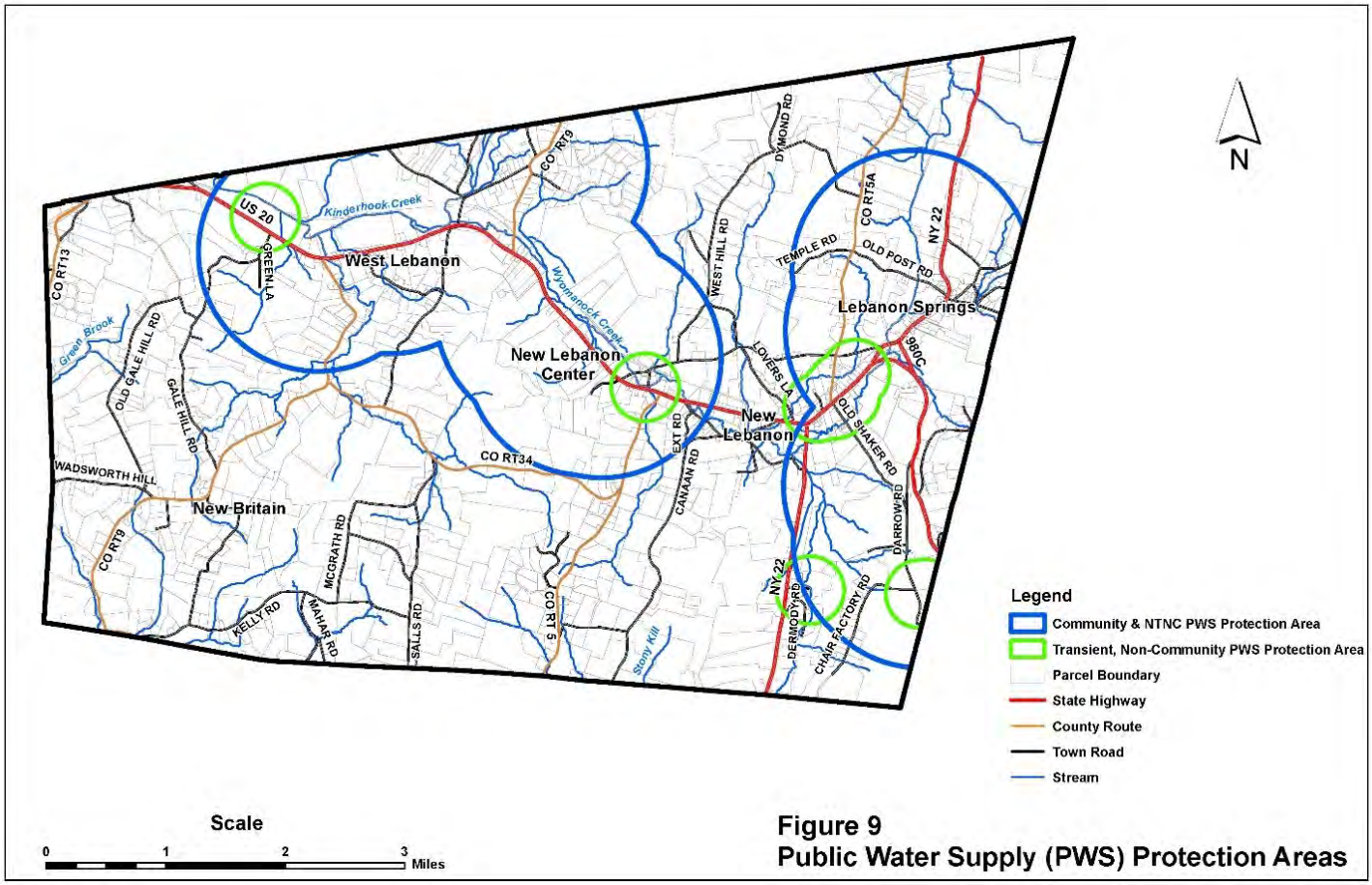

Figure 9
Public Water Supply (PWS) Protection Areas

NOTE: A full-sized map (scaled for 11”x17”), of this representational image is provided in Appendix B

2. Individual Water Supply 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 Table 5 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 5. Required Minimum Separation Distance to Protect Water Wells

The DWSP2 Summary Table:

2.2 Prepare a Drinking Water Source Protection Map

2.2 Prepare a Drinking Water Source Protection Map

Provide a description of established drinking water source protection areas below, including distances and/or time of travel information. In addition, make note of any applicable studies (e.g. Wellhead Protection Plan) or technical assistance that were used to determine each protection area and/or delineation method:

Protection Areas	Description	Delineation Method
Ownership and Control Area (for groundwater) or Control and Monitoring Area (for surface water)	NYS Sanitary Code requires that the owner of a public water system possess one hundred feet ownership around the well and control land activities within 200 feet of the well. In an effort to maintain security, the ownership and control area has not been mapped for the various privately-owned public water systems in New Lebanon.	Other
Critical Area	Due to insufficient groundwater flow, pumping rates and well construction data, a precise contribution area cannot be delineated for these various privately-owned water system wells. The 1-mile radius around community and non-transient, non-community water systems and 1,500-foot radius around transient, non-community water systems are presumed to capture the Critical Areas.	Arbitrary fixed radius
Source Water Area	Due to insufficient groundwater flow, pumping rates and well construction data, a precise contribution area cannot be delineated for these various privately-owned water system wells. 1-mile radius around community and non-transient, non-community water systems and 1,500-foot radius around transient, non-community water systems. These arbitrary fixed radii are consistent with SWAP guidelines.	Arbitrary fixed radius
Additional Protection Area (if applicable)	NA	

Below is a list of sources of publicly available data:

URL	Publicly Available Data
https://data.ny.gov/	• Bulk Storage Facilities • Solid Waste Management Facilities • Environmental Remediation Sites • Superfund Sites • Spill Incidents • Oil, Gas and Other Regulated Wells • SPDES Multi-Sector General Permit • Combined Sewer Overflows (CSOs) • Water Withdrawals by Facility • Boat Launch Sites • Inventory & Priority Waterbodies
https://gis.ny.gov/	• State Pollutant Discharge Elimination System • NYS DOT Facilities • NYS Tax Parcels • USGS Digital Raster Graphic Quadrangle • NYS Tax Parcels
https://mrlc.gov/	• NLCD Land Cover
http://opdgig.dos.ny.gov/index.html#/home	• Unconsolidated Aquifers
https://datagateway.nrcs.usda.gov/GDGOrder.aspx	• NRCS Conservation Easement Areas by State
https://www.conservationeasement.us/	• Conservation Easement Areas US
https://datagateway.nrcs.usda.gov/GDGOrder.aspx#	• National Hydrography Dataset 1:24,000
http://www.dec.ny.gov/lands/5374.html	• Mines
https://www.eia.gov/	• Pipelines
https://www.epa.gov/	• TRI Basic Data Files

Provide a description of the map layers created or acquired to create the source water protection map below:

Layer	Date Created or Acquired	Description
Community and non-transient, non-community water systems	8/2/2022	NYRWA created layers from parcels of federally-regulated and state-regulated community water systems as well as non-transient, non-community water systems.
Transient, non-community water systems	8/2/2022	NYRWA created layer from parcels of transient, non-community water systems.
Elevation and slopes data	4/10/2022	Elevation and slope data calculated by NYRWA using 1-meter cell size digital elevation models derived from 2015-2016 Light Imaging Detection and Ranging (LiDAR) data from the New York Office of Information Technology Services.
Watersheds	8/26/2022	NYRWA derived the New Lebanon HUC-12 watersheds from NRCS 12-digit HUC-12 watershed dataset.
Sand and gravel well data and bedrock well data	8/30/2022	Compiled and mapped by NYRWA from NYS DEC Water Well Contractors data, USGS Site Inventory Database, and study by Lafleur & DeSimone (1991).
Sand and gravel aquifers	11/24/2021	Mapped by Steven Winkley, P.G. using detailed surficial geologic mapping and interpretation of subsurface data from water wells and monitoring wells.
Bedrock geology	11/12/2020	Compiled using GIS by Steven Winkley, P.G. based upon a number of published and unpublished mapping sources listed in the plan.
Public water supply protection areas	7/12/2022	Using ArcGIS, NYRWA mapped a one-mile dissolved buffer around community water systems and a 1,500-foot dissolved buffer around non-transient, non-community systems.
Private/Commercial/Institutional (PCI) wastewater permitted facilities	9/12/2022	NYRWA inventoried and mapped private/commercial/institutional (PCI) wastewater permits using the NYS DEC's Permit Applications - Search Wizard.
Permitted mines	2/2/2022	NYRWA searched the online New York State DEC's Mined Land Reclamation database and checked against the DECinfo Locator.
Stormwater Discharge from Industrial Activity	11/23/2020	WASTEQUIP MANUFACTURING COMPANY LLC is listed as a multi-sector general permit facility.
Active petroleum bulk storage facilities	10/19/2020	NYRWA inventoried regulated NYSDEC petroleum bulk storage facilities using the online database. This was checked online against the DECinfo Locator.
Higher risk land uses	9/16/2022	NYRWA used property classification codes from parcel mapping to identify land uses that may pose a higher risk of contamination.
Groundwater-related historical spills	5/19/2022	NYRWA searched the online New York State DEC's spills database for groundwater-related spills in New Lebanon.

E. POTENTIAL CONTAMINANT SOURCE INVENTORY

The next portion of the drinking water source assessments in New Lebanon consists of an inventory of potential contaminant sources. 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. NYRWA has plotted several potential sources of contamination across the Town of New Lebanon on Figures 10-12. Note that nearly all potential sources of contamination are located within the Wyomanock and Kinderhook Valleys along the NY Route 22/US Route 20 corridor.

Many of these are government-regulated such as wastewater discharges, mines, petroleum bulk storage facilities, etc. (see Figure 10). Several sites were identified whose historic uses are of potential concern for contamination, namely the former Bouchard Landfill (Figure 10), the former Ceramaseal, Inc., (CeramTec) and former New Lebanon Landfill.

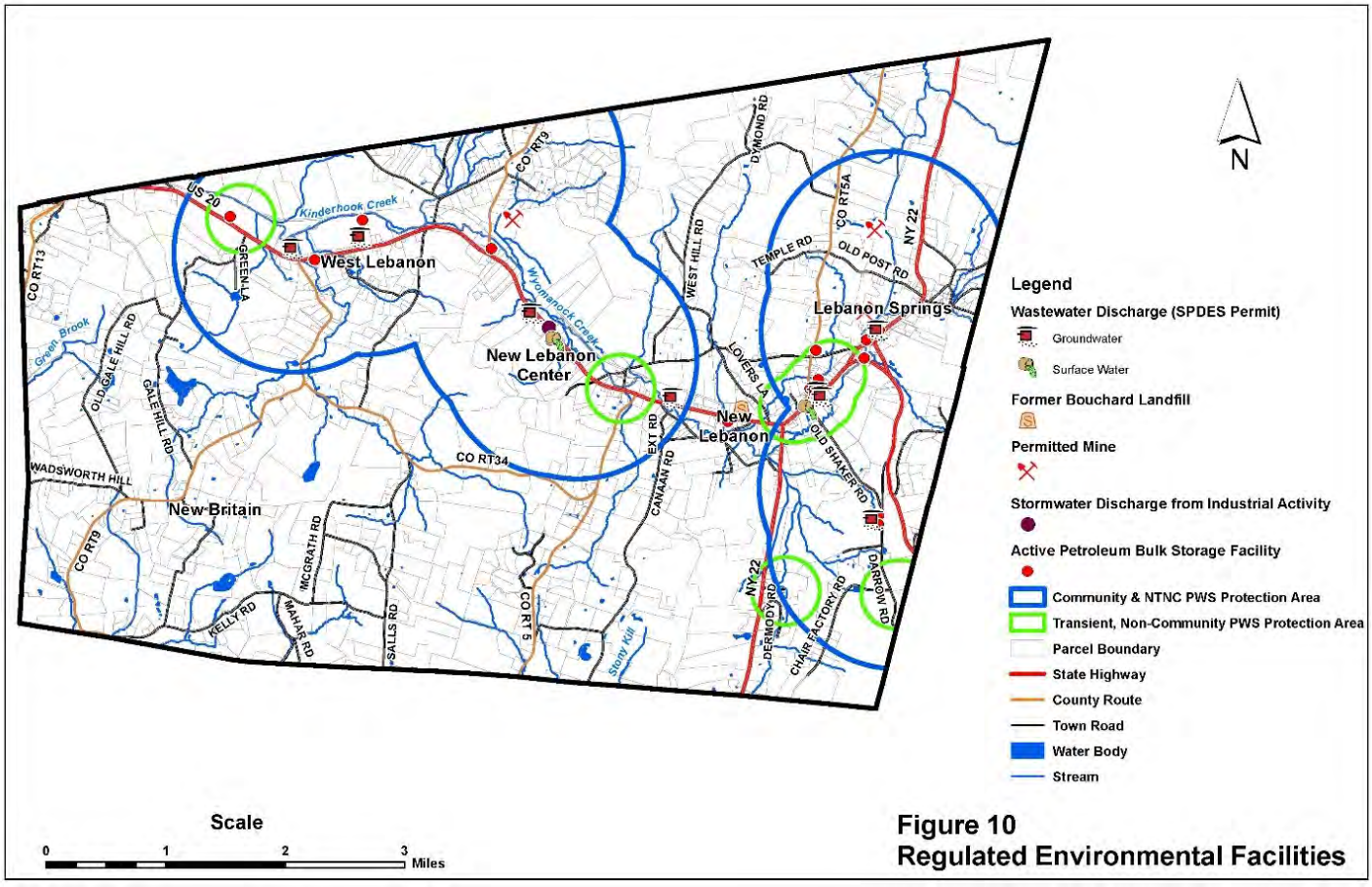

Figure 10
Regulated Environmental Facilities

NOTE: A full-sized map (scaled for 11”x17”), of this representational image is provided in Appendix B

There also have been several spills that have been identified as impacting groundwater resources in New Lebanon. These are identified on Figure 11. Such spills have been remediated and are categorized now as being closed by the NYSDEC. Most of these spills were due to equipment failures such as with tanks.

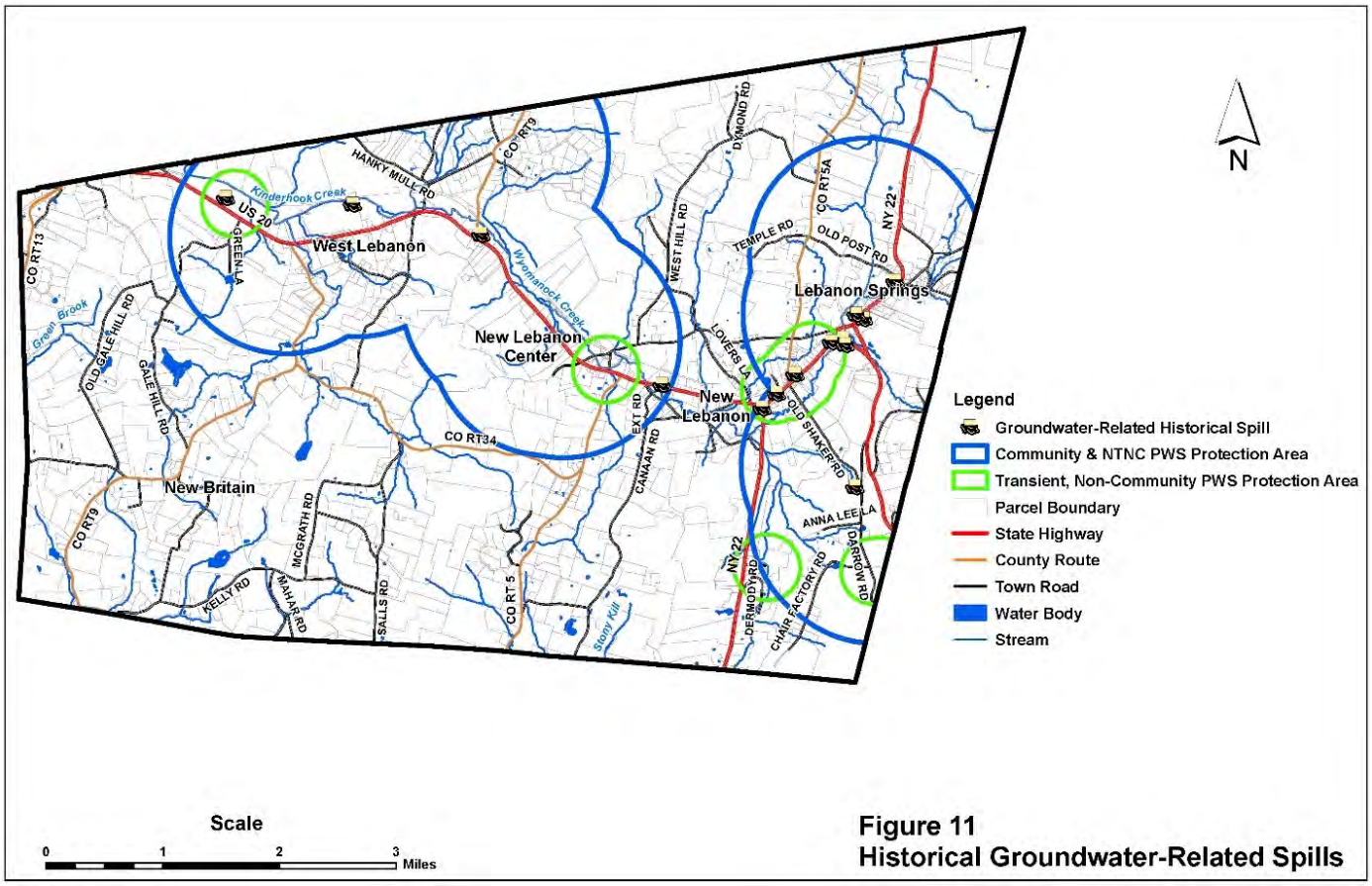

Figure 11
Historical Groundwater-Related Spills

NOTE: A full-sized map (scaled for 11”x17”), of this representational image is provided in Appendix B

The NYSDOH Bureau of Water Supply Protection tested water from IWS wells downgradient from the former Bouchard Landfill (Figure 10) and the former Ceramaseal, Inc., (CeramTec) facility on US Route 20 for other parameters in addition to the routine physical and chemical group parameters that all the IWS wells across New Lebanon were tested for. Three wells downgradient from CeramTec were sampled for metals and volatile organic compounds (VOCs). Two wells downgradient from the former Bouchard Landfill were analyzed for VOCs. No levels of VOCs were detected. The concentration of metals in the three wells were either below detection limits or considerably below MCLs.

As part of its Inactive Landfill Initiative (ILI) Program, NYSDEC had monitoring wells at the former New Lebanon Landfill off Old Post Road (Figure 12) sampled. Elevated levels of per- and polyfluoroalkyl substances (PFAS) were found in some monitoring wells located immediately downgradient from the former municipal landfill (up to 160 ng/L PFOA). As a result, the NYSDEC and NYSDOH did a coordinated sampling of IWS wells situated downgradient from the former New Lebanon Landfill (Figure 12) on Old Post Road in 2020. No levels of PFAS were detected. Following the detection of elevated levels of PFOS (11 ng/L) at the New Lebanon High School (see page 8), another round of IWS well sampling covering 11 wells was conducted earlier this year. These wells were situated on Old Post Road, County Route 5A, or NY Route 22 in Lebanon Springs. Again, no wells had detectable levels of PFAS. No other indicators of landfill leachate were evidently detected either.

On Figure 12 are some potential sources of contamination that are higher risk land uses identified chiefly from real property type classification codes. These include auto body, tire shops, other related auto sales, auto dealers, motor vehicle service, highway garages, a former landfill, cemeteries, etc.

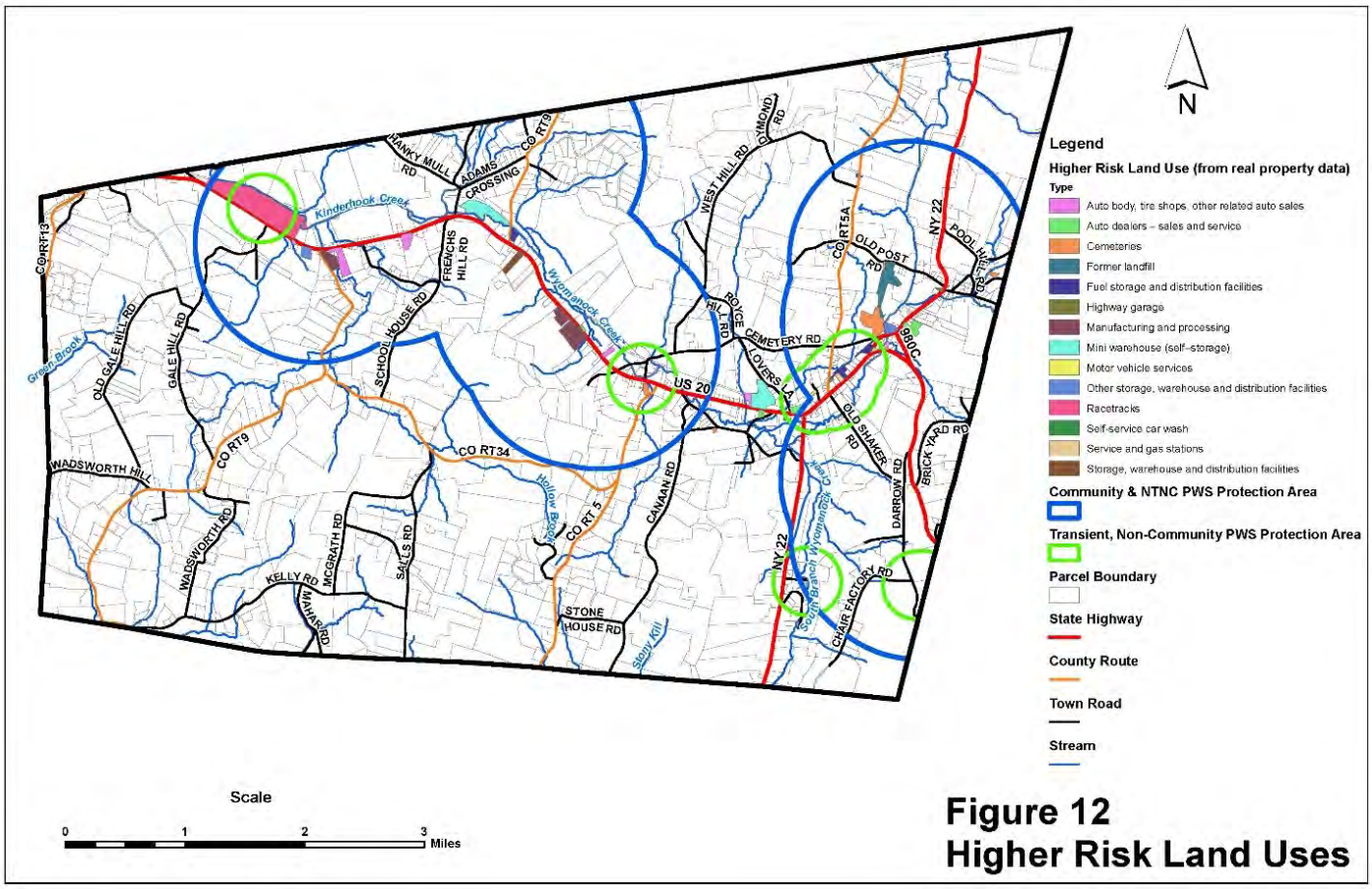

Figure 12
Higher Risk Land Uses

NOTE: A full-sized map (scaled for 11”x17”), of this representational image is provided in Appendix B

The DWSP2 Summary Table below is a summary inventory table of the most common identified regulated potential contaminant sources and higher risk land uses.

DWSP2 Summary Table:
2.3 Potential Contaminant Source Inventory

2.3 Create a Potential Contaminant Source Inventory			
Fill out the potential contaminant source inventory table below.			
Potential Source	**Contaminant(s) of Concern**	**Protection Area(s) Impacted**	**Relevant Information**
Petroleum Bulk Storage Facilities	Leaks of petroleum or other substances from tanks or spills during delivery or handling.	Critical area	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.	Critical area	Regulated by NYSDEC. All active smaller discharges to groundwater are covered under general permits.
Sand and Gravel Pits	Accidental leaks of petroleum or clandestine dumping.	Critical area	Regulated by NYSDEC. Information on mines can be found at: https://www.dec.ny.gov/cfmx/extapps/MinedLand/search/ mines/
Vehicle Maintenance Shops	Solid and hazardous wastes that are handled and generated.	Critical area	Depending upon the type and amount of wastes, hazardous waste regulations are likely required to be followed. More information can be found at: https://www.dec.ny.gov/docs/permits_ej_operations_pdf/vehiclemaint.pdf
Cemeteries	Research indicates levels of bacteria, metals (e.g. arsenic), and nutrients have been found to be elevated in groundwater near cemeteries.	Critical area	One of the most recent studies in the United States can be downloaded at: https://doi.org/10.3133/sir20185120

Table 6. Potential Contaminant Sources Inventory

F. WATER PROTECTION AND IMPLEMENTATION STRATEGIES

Source water protection methods are a set of approaches that a municipality and its residents can take to protect drinking water source protection areas. Some methods are not specific to a potential contaminant source and can be utilized through regulatory and/or non-regulatory means, while other methods address specific contaminant sources as identified through the process of developing this SWPP. Below is an outline of issues identified as well as completed and planned implementation strategies.

Protection methods, as described in Section 4, have been proposed to help mitigate potential impacts to groundwater resources that serve as drinking water sources in New Lebanon. The priority issues and their protection methods, as developed with New Lebanon are:

- Potential Contaminants
- Water Quality in the Rtes. 22 &20 Corridor
- Education and Outreach
- Designation of critical environmental areas for sensitive groundwater resources, and
- Development of a climate vulnerability assessment and hazard mitigation plan.

Implementation timing for these strategies has been noted to allow the Town, and its volunteer Committee to organize protection efforts, develop reasonable expectations, and encourage completion of the work.

1. Potential Contaminants

The purpose of monitoring and reporting is to get a better understanding of water quality and contamination issues in the Town and to determine the focus of potential additional protection strategies. Some well supplies in New Lebanon have been identified as being more sensitive to contamination. The most susceptible wells are those that are shallow, lack a confining layer and/or are situated in areas prone to flooding or other potential contaminant sources. Identifying contamination can direct pollution control and protection efforts.

Implementation Steps

A. Acquisition and review of monitoring information from regulated public drinking water systems. This data, accessible from the Columbia County Department of Health, should be obtained and reviewed every 2-3 years (2024-2028).

B. Sampling of IWS wells by NYS DOH and Town with review and analysis of data (2021-2025). Upwards of 80 well samples have been collected and the Town

obtained lab results for routine physical and chemical group analysis. Targeted PFAS testing of IWS wells has revealed no detectable levels southwest and southeast of the former New Lebanon Landfill off Old Post Road. There has been an interest expressed to investigate PFAS in other areas of New Lebanon. Table 7 can be used to identify priority areas for PFAS sampling in New Lebanon. Based upon the potential contaminant source inventory (Figures 10-12), areas of highest risk of PFAS would be along NY Route 22/US Route 20 corridor in the Wyomanock and Kinderhook Valleys. Most susceptible wells in this valley setting would be those under fifty feet in depth. This continued testing would be made possible from an ARPA (American Rescue Plan Act) grant. Some shallow wells tapping the unconfined unconsolidated aquifer in the Wyomanock Creek valley near the hamlet of New Lebanon and businesses and residences along Shaker Rd and West St have issues with bacteria. Water well testing here can help to clarify and address this issue.

C. Investigation of known contamination issues was conducted throughout development of this Plan and to help tailor management methods. These include the former Bouchard Junkyard Landfill and CeramTec (formerly Ceramaseal Inc.) sites, both in critical aquifer areas, as well as the former New Lebanon Landfill located near Lebanon Springs. The following implementation steps were taken for this effort:

a. <u>CeramTec</u>

i. Research Regulatory Actions Taken at Facility: An Environmental Due Diligence Assessment concluded that there is a potential for Environmental impacts at the site. (Jan. 2004); Phase II Environmental Site Assessment Subsurface Investigation concluded that no further investigations or actions were recommended (April 2005).

ii. Well Water Testing:
    1. Testing results from 3 IWS downgradient from the former facility showed no VOC detection, and no detection or considerably below MCLs for metals (June 2021).
    2. Testing of former facility fire pond (where wash water was deposited) showed no VOC detection, and metals detection.

iii. Well Water Testing will continue for residents with water quality concerns (2023-2025).

b. Bouchard Junkyard Landfill

i. Research Regulatory Actions Taken at Facility: NYS DEC Record of Decision selected a remedial plan for the site (March 2004/ Amended Oct. 2006); Final Remediation Report completed (Aug. 2009). Recommended that a Site Management Plan be developed and implemented; Site was delisted as a State Superfund Site (April 2015)

ii. Well Water Testing

iii. Testing results from 3 IWS downgradient from the former facility showed no VOC detection and no detection, or considerably below MCLs for metals (June 2021).

iv. Well Water Testing will continue for residents with water quality concerns (2023-2025).

c. New Lebanon Landfill

i. As part of its Inactive Landfill Initiative (ILI) Program, NYSDEC had monitoring wells at the former New Lebanon Landfill off Old Post Road sampled. Elevated levels of per- and polyfluoroalkyl substances (PFAS) were found in some monitoring wells located immediately downgradient from the former municipal landfill (up to 160 ng/L PFOA). As a result, the NYSDEC and NYSDOH did a coordinated sampling of IWS wells situated downgradient from the former New Lebanon Landfill on Old Post Road in 2020. No levels of PFAS were detected. Following the detection of elevated levels of PFOS (11 ng/L) at the New Lebanon High School (see page 8), another round of IWS well sampling covering 11 wells was conducted in 2022. These wells were situated on Old Post Road, County Route 5A, or NY Route 22 in Lebanon Springs. Again, no wells had detectable levels of PFAS. No other indicators of landfill leachate were evidently detected either.

ii. Well Water Testing will continue for residents with water quality concerns (2023-2025).

2. Water Quality in the Routes 20 and 22 Business District

Water Quality in the Routes 20 and 22 business district is an ongoing concern:

- The inventory of potential contaminant sources provided in this Plan (see Table 6) are nearly all located within the Wyomanock and Kinderhook Valleys along the NY Route 22/US Route 20 corridor.
- The lack of Water and WasteWater (W/WW) infrastructure along the NY Route 22/US Route 20 corridor is a concern.
- Potential contaminant loadings from road maintenance are a concern.

Implementation Steps

1. Roadways:

Drainage ditch on Route 22 after December 2023 rain event.

a. Begin inventory of roads, ditches and discharge areas to delineate potential areas of water quality concern.

b. Research maintenance practices which can mitigate water quality impacts such as those related to de-icing or erosion.

c. Collaborate with NYS DOT, Columbia County and Town road maintenance operators to facilitate and encourage Best Management Practices which mitigate impacts to water quality.

2. Water and Wastewater Contamination:

a. The Town engaged Lamont Engineering to produce and submit a Consolidated Funding Application for a W/WW feasibility study in the business district.
   i. Preparation of the study is planned for February - December 2024.
   ii. Agency review is anticipated January to July 2025 with application for implementation funding to follow.
   iii. Facility planning timeline would be expected from 2025 - 2027.

b. DWSP2 Designation, New Lebanon is applying for DWSP2 which will help with funding and program development (2024).

c. Well Water Testing has identified at least 8 positive coliform tests and 3 positive for E. coli tests in the business district to date. Testing will be ongoing through 2024.

3. **<u>Increase Community Support and Grow Awareness of the Importance Water Protection</u>**

Public education and outreach increases awareness for local landowners, residents, and officials of the importance of protecting drinking water resources. Much outreach has already been implemented successfully and more will continue through many avenues, raising awareness of water protection and support for Town efforts.

Implementation Steps

1. Trees for Tribs, riparian buffer mitigates flooding (2021); 375 trees have been planted along stream in Shatford Park. Maintenance of new trees is ongoing (2021-2024)

2. Tabling at the New Lebanon Town Picnic (annually, 2023-2027); garnered much interest; 10 people signed up for water well testing.

Tabling at the NL Town Picnic are Donald Lamonaca of the CAC and Town Board member Deb Gordon

3. Columbia Land Conservancy conducted an immersive session with the Town's children's summer camp highlighting the Trees for Tribs program (annually, 2023-2027).

4. Planning water testing and conservation awareness programs at the Town Library (Winter/ annually, 2023-2027).

5. The Town Newsletter will continue to update residents about water conservation efforts. (periodically, 2023-2027)

6. Town Website will continue to update residents about water conservation efforts. (periodically, 2023-2027)

7. An online well survey was conducted in 2017-2018 in the Town.

8. Water Testing as detailed in other sections is instrumental for raising awareness about the importance of water quality. (periodically, 2021-2025)

9. "Our Town" forum - COULD HOOSICK FALLS HAPPEN HERE (March 2, 2019); Liz Moran from NYPIRG spoke, Gretchen Stevens of HUDSONIA spoke, Robert Hayes of EANY spoke, Peg Munves of NLCAC spoke and Tistrya Houghtling (current Town Supervisor) spoke as Pres of NL DEMS, Nassau Town Supervisor David Fleming spoke on dangers posed by contamination. Add

4. **<u>Assess Potential Drinking Water Impacts Resulting from Climate Hazards (2021 – 2027)</u>**

Potential climate change impacts could affect both the quality and quantity of drinking water wells. The Town intends to identify, analyze, and prioritize the effects of climate hazards and risks due to drought, floods, fires and other natural disasters.

The Town of New Lebanon is working with Cornell Cooperative Extension Service in Columbia County on developing a Climate Vulnerability Assessment (CVA). This involves identifying, analyzing, and prioritizing the effects of climate hazards and risks, like flooding, drought, etc. The potential impacts of identified climate hazards to drinking water is one of the steps identified by the Climate Smart Communities (CSC) program. Note that a vulnerability assessment that addressed seasonal drought was prepared by Anthonisen (2020).

The Town plans to develop a climate adaptation plan and/or a climate-resilient hazard mitigation plan. Drinking water impacts from climate-related hazards such as flooding and drought would be included in the adaptation/mitigation plan. For example, it has been proposed that a water resources contingency plan be developed to ensure the availability of water for drinking, agriculture and use by the Lebanon Valley Protective Association (LVPA) (Hughes & Ahktar, 2021).

Implementation Steps

1. An approved DWSP2 Plan in New Lebanon can help with funding and with the Climate Smart Communities (CSC) program (2023-2024).

2. Trees for Tribs, riparian buffer mitigates flooding (2021); 375 trees have been planted along stream in Shatford Park. Maintenance of new trees is ongoing (2021-2024).

3. Propose installation of a 10,000 gallon water tank at the Fire House to ensure sufficient water supply in climate related emergencies.

4. The Town is working with Columbia County on a Hazard Mitigation Plan (2023-2025).

5. The Town is working with Cornell Cooperative Extension Service in Columbia County on a Climate Vulnerability Assessment (CVA).

6. New Lebanon is participating in the Climate Smart Communities (CSC) program which requires consideration of the potential impacts of climate hazards to drinking water.

5. Critical Environmental Areas

Critical Environmental Areas (CEAs) designation can protect drinking water in New Lebanon by acknowledging particularly sensitive groundwater resource areas. Local governments may designate a CEA under 6 NYCRR 617.14(g) of State Environmental Quality Review (SEQR) regulations. CEA designation is meant to raise awareness about the notable features contained within the CEA to landowners, developers, and government agencies. When approving, funding, or directly undertaking an action that may affect the environment under SEQR, an agency of government at the state, county and local level within New York must specifically consider how the proposed action might affect the qualities of the designated area. CEA designation ensures that any potentially harmful impacts to the exceptional or unique features of the CEA are evaluated. A CEA is an area with exceptional character with respect to one or more of the following:

1. a benefit or threat to human health;
2. a natural setting such as fish and wildlife habitat, forest and vegetation, open space, and areas of important aesthetic or scenic quality;
3. agricultural, social, cultural, historic, archeological, recreational, or educational values; or
4. an inherent ecological, geological, or hydrological sensitivity that may be adversely affected by any change.

Protecting drinking water resources meets criterion one and four above.

Implementation Steps

1. On May 10, 2022, the Town of New Lebanon passed a resolution designating the contribution area for the Warm Spring as a CEA.

2. On June 14, 2022, the Town approved a second CEA for cool ravines, a regionally rare habitat where steep, rocky ravine walls flank a stream.

3. Additional CEA designation are being considered based on sensitive hydrogeological areas identified in this Plan (see Figure 13)

Particularly sensitive groundwater resource areas in New Lebanon that may be adversely impacted by land use changes and could be considered for CEA designation include: a) where carbonate (karst) bedrock is at or near the land surface; and b) where sand and gravel is found at or near the land surface. Figure 13 is a map of these sensitive hydrogeological areas. New Lebanon has previously designated two CEAs within its boundaries.

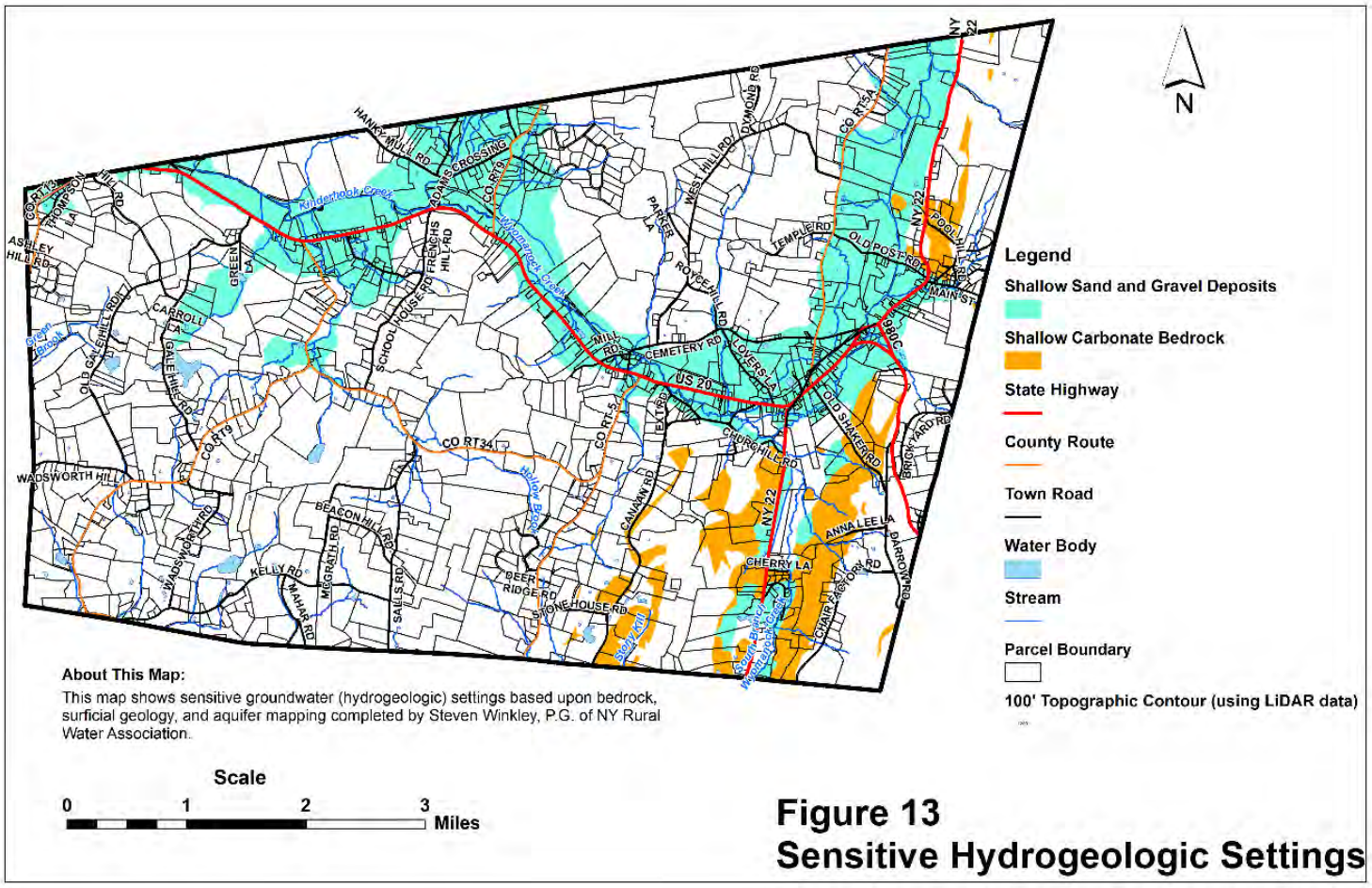

Figure 13
Sensitive Hydrogeologic Settings

DWSP2 Summary Tables:

3.1 Identify Protection and Management Methods and 3.2 Develop an Implementation Timeline

3.1 Identify Protection and Management Methods & 3.2 Develop an Implementation Strategy Timeline

Fill in the implementation strategy timeline below including identified protection and management methods:

Priority Issue	Targeted Potential Contaminant Source(s)	Goal	Protection Method and/or Management Method	Potential Cost	Potential Funding Sources	Project Leader and Partnerships Needed	Implementation Timing
Potential Contaminants	Nitrate	Continually identify the current status of water supply resources and potential threats.	Acquisition and review of monitoring information from regulated public water systems.	NL CAC Volunteer and NYRWA Hours	NA	Columbia County DOH, NYRWA, NL CAC	2024-2026
	Nitrate, PFAS, others	Continually identify the current status of water supply resources and potential threats.	IWS water well testing	NYS DOH Program hours; NL CAC Volunteer and NYRWA Hours	$6,705 Lab costs/DOH expense; $30,000 ARPA grant funding.	NYS DOH; NL CAC NYRWA	2021-2025
	Industrial wastes	Continually identify the current status of water supply resources and potential threats.	Monitoring and Reporting	NL CAC Volunteer and NYRWA Hours		NYS DOH; NYRWA; NL CAC; NYS DEC	2021-2025
Water Quality in the Routes 20 and 22 Business District	Deicing Materials	Recommend and implement protection strategies on an ongoing basis in order to protect water resources.	Engage NYS DOT with respect to road salt contamination and winter road management practices in New Lebanon.	NL CAC Volunteer and NYRWA Hours	NA	NYS DOT, NYS DEC, NYRWA, Town of NL, CAC	2024-2027
	Septic Loadings	Recommend and implement protection strategies on an ongoing basis in order to protect water resources.	Water and Wastewater feasibility study in the business district	NL CAC Volunteer and NYRWA Hours	Town costs? Grant writer?	Town of New Lebanon; NL CAC NYRWA	2023-2025
Increase Community Support and Grow Awareness of the Importance Water Protection	Various potential household and Land Use products/contaminants.	Recommend and implement protection strategies on an ongoing basis in order to protect water resources.	Trees for Tribs, Children's summer camp programming, Tabling, Water testing, Town Newsletter and Town Website postings, Water well survey, Speaker sessions.	Town of New Lebanon; NL CAC Volunteer and NYRWA Hours	Approximately $1,000 Town annual budget contribution; Volunteer contributions.	Town of New Lebanon, NL CAC, NYS DOH, Columbia Land Conservancy, NYRWA	2018 - 2027, ongoing.
Assess Potential Drinking Water Impacts Resulting from Climate Hazards	Flooding, Drought and other impacts to water supply.	Recommend and implement protection strategies on an ongoing basis in order to protect water resources.	Participation in Climate Smart Communities program, DWSP2 Application & Designation, Develop a Hazard Mitigation Plan and Climate Vulnerability Assessment, Trees for Tribs, Tabling, Speaker sessions.	Town of New Lebanon; NL CAC Volunteer and NYRWA Hours	?	Cornell Cooperative Extension Service in Columbia County, NL CAC , Town of New Lebanon, NYS DOH, NYS DEC Columbia County, NYRWA,	2018 - 2027, ongoing.
Critical Environmental Areas	Land Use contaminants.	Continually identify the current status of water supply resources and potential threats.	Two CEAs were created in 2022 and a third may be considered in 2024.	Town of New Lebanon; NL CAC Volunteer and NYRWA Hours	NA	Town of New Lebanon; NL CAC NYRWA	2022-2024

G. PLAN MANAGEMENT

New Lebanon began working with NYRWA in 2017 to implement water protection measures and produce this SWPP/DWSP2. The Plan management team has been active, dedicated and engaged. Much has been accomplished and implemented to date. In the development of this Plan, the Town has: gained a better understanding of existing and potential water quality issues; identified ways to promote drinking water quality; and mapped a path forward.

The Town plans to update this DWSP2 every 3-5 years with any substantial changes and progress in order that it remain effective and relevant. It will submit a revision to the NYS DWSP2 team at the time of revision. The Plan management team has been designated as the current members of the Conservation Advisory Council and will report DWSP2 progress to the Town Board at least once every 12 months.

The DWSP2 Summary Table:

Designate a Plan Management Team

4.1 Designate a Plan Management Team		
Name	**Contact Information**	
	E-mail	**Relevant Affiliation(s)**
Peg Munves	nlcac.munves@gmail.com	New Lebanon Conservation Advisory Council, Co-Chair; Water Source Protection Committee, Co-Chair; Environmentalist; Agriculturalist.
Bob Gilson	nlcac.gilson@gmail.com	Climate Smart Task Force, Member; New Lebanon Conservation Advisory Council, Member; Conservationist.
Steve Powers	nlcac.powers@gmail.com	Climate Smart Task Force, Chair; CAC, Member; Zoning Rewrite Committee, Member; New Lebanon Town Board Member.
Donald Lamonaca	nlcac.lamonaca@gmail.com	New Lebanon CAC; New Lebanon Zoning Rewrite Committee; Corkscrew Rail Trail committee; finance expertise; outdoorsman and conservationist.
Tyler Fogg	nlcac.fogg@gmail.com	Berkshire Natural Resources Council, Trails Manager; New Lebanon CAC, member
William O'Neill	baghouse101@gmail.com	Retired Attorny; New Lebanon CAC member; Naturalist and Conservationist.
Bruce Shenker	bshenker@gmail.com	New Lebanon Conservation Advisory Council, Member; Columbia County Environmental Management Council, NL Representative

The DWSP2 Summary Table:
Designate a Plan Management Team (continued)

Use the table below to document the Plan Management strategy for keeping the DWSP2 Plan up to date:	
Plan Management Summary	
Item	**Status**
Designate a Plan Management Team	Complete
Determine progress report frequency 12 Months	Complete
Share progress reports	In Process
Review and share the plan	Complete
Verification from NYS DOH and DEC for completeness	In Process
Create a revision schedule	Complete

Use the table below to track updates and revisions to the DWSP2 Plan. Use the notes section to detail changes made in each update and/or revision:		
Update/Revision Tracker		
Report	**Date**	**Notes**
First report:		
Update/Revision 1		
Update/Revision 2		
Update/Revision 3		
Update/Revision 4		
Update/Revision 5		
Update/Revision 6		
Update/Revision 7		
Update/Revision 8		

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Appendix A

The DWSP2 Summary Tables

1.1 Form a Stakeholder Group		
List the Stakeholder Group names, contact information and relevant affiliation(s)		
Name	**Contact Information**	
	Email	**Relevant Affiliation(s)**
Peg Munves	nlcac.munves@gmail.com	New Lebanon Conservation Advisory Council, Co-Chair; Water Source Protection Committee, Co-Chair; Environmentalist; Agriculturalist.
Bob Gilson	nlcac.gilson@gmail.com	Climate Smart Task Force, Member; New Lebanon Conservation Advisory Council, Member; Conservationist.
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Bruce Shenker	bshenker@gmail.com	New Lebanon Conservation Advisory Council, Member; Columbia County Environmental Management Council, NL Representative

1.2 Establish Goals and Formulate a Vision		
Provide the community's vision for the source water protection plan in the space below:	List community-specific goals for your source water protection plan below:	
Vision Statement		
Seek to further develop New Lebanon's water resources planning and management strategies in order to protect drinking water resources.	**Goal**	Continually identify the current status of water supply resources and potential threats.
	Goal	Recommend and implement protection strategies on an ongoing basis in order to protect water resources.

List the meeting dates and summaries of topics covered at stakeholder meetings below	
Date	**Topic(s) Covered**
6/13/2022	Plan summary presentation
10/2/2017	Protection workshop and presentation
9/10/2018	Provided a progress update, including a summary of water well survey and compilation of hydrogeologic data
12/9/2019	Provided a progress update
3/12/2020	Mapping review
11/12/2020	NYSDOH well sampling meeting
6/13/2022	Plan summary presentation
9/12/2022	Final plan presentation
6/1/2023	Plan meeting.
8/25/2023	Implementation planning meeting
9/12/2023	Town Board approved Revised Plan contingent on DWSP2 approval.
1/8/2024	Stakeholder Plan meeting, implementation and DWSP2 review.

2.1 Develop an Overview of the Water System			
Fill in the water system overview table below:			
Water system name:	See Table 1 and Figures 1 & 2 of plan		
NYS PWS ID:	PWSID#s and details for 22 Systems are compiled Table 1 of the Plan.		
Type of water system (e.g. community, non-community, transient, non-transient):	CWS, NTNCWS, and TNCS		
Name of the community, or communities, served by the system:	22 Drinking water systems in the Town of New Lebanon, as litsed in Table 1.		
Population served by the system:	Approximately 1982 total people served by all systems types.		
# of service connections:	Insufficient available service connection data.		
Summary of wells, intakes, infiltration galleries, and/or springs including name, depth, screen length and pumping rates where applicable:	Available information has been gathered from Columbia County DOH records; details are presented in Table 2 of this Plan.		
General treatment information:	Most Community Water Systems rely upon chlorination for disinfection. Some smaller transient, non-community water systems have waivers from disinfection or utilize UV disinfection.		
Summary of hydrogeographic setting of drinking water sources including watershed information and/or type of aquifer and aquifer materials (this information may be gathered after delineating protection areas in section 2.2):	Drinking water system wells are found in unconsolidated and bedrock aquifers throughout the Town and in the Tackawasick Creek-Kinderhook Creek, Black River-Kinderhook Creek and Wyomanock Creek HUC 12 watersheds. Further details in Section 3.2 of plan		
Water quality summary including any known ambient water quality information, finished water detections, and/or history of maximum contaminant level (MCL) violations*:	Available data for New Lebanon's 22 drinking water systems is compiled in Table 2 of the Plan.		
Water quantity summary:	Current Water Withdrawal Permit Expiration Date(s)	N/A	
	Total Permitted Water Withdrawal Capacity	N/A	MGD
	Average Daily Water Demand (= Yearly Usage / 365)	N/A	MGD
	Maximum Daily Water Demand (Unofficial 3-day average in peak month - e.g. July)	N/A	MGD
	Daily Water Losses (can be obtained from Water Conservation Program form)	N/A	MGD

2.2 Prepare a Drinking Water Source Protection Map

Provide a description of established drinking water source protection areas below, including distances and/or time of travel information. In addition, make note of any applicable studies (e.g. Wellhead Protection Plan) or technical assistance that were used to determine each protection area and/or delineation method:

Protection Areas	Description	Delineation Method
Ownership and Control Area (for groundwater) or Control and Monitoring Area (for surface water)	NYS Sanitary Code requires that the owner of a public water system possess one hundred feet ownership around the well and control land activities within 200 feet of the well. In an effort to maintain security, the ownership and control area has not been mapped for the various privately-owned public water systems in New Lebanon.	Other
Critical Area	Due to insufficient groundwater flow, pumping rates and well construction data, a precise contribution area cannot be delineated for these various privately-owned water system wells. The 1-mile radius around community and non-transient, non-community water systems and 1,500-foot radius around transient, non-community water systems are presumed to capture the Critical Areas.	Arbitrary fixed radius
Source Water Area	Due to insufficient groundwater flow, pumping rates and well construction data, a precise contribution area cannot be delineated for these various privately-owned water system wells. 1-mile radius around community and non-transient, non-community water systems and 1,500-foot radius around transient, non-community water systems. These arbitrary fixed radii are consistent with SWAP guidelines.	Arbitrary fixed radius
Additional Protection Area (if applicable)	NA	

Below is a list of sources of publicly available data:

URL	Publicly Available Data
https://data.ny.gov/	• Bulk Storage Facilities • Solid Waste Management Facilities • Environmental Remediation Sites • Superfund Sites • Spill Incidents • Oil, Gas and Other Regulated Wells • SPDES Multi-Sector General Permit • Combined Sewer Overflows (CSOs) • Water Withdrawals by Facility • Boat Launch Sites • Inventory & Priority Waterbodies
https://gis.ny.gov/	• State Pollutant Discharge Elimination System • NYS DOT Facilities • NYS Tax Parcels • USGS Digital Raster Graphic Quadrangle • NYS Tax Parcels
https://mrlc.gov/	• NLCD Land Cover
http://opdgig.dos.ny.gov/index.html#/home	• Unconsolidated Aquifers
https://datagateway.nrcs.usda.gov/GDGOrder.aspx	• NRCS Conservation Easement Areas by State
https://www.conservationeasement.us/	• Conservation Easement Areas US
https://datagateway.nrcs.usda.gov/GDGOrder.aspx#	• National Hydrography Dataset 1:24,000
http://www.dec.ny.gov/lands/5374.html	• Mines
https://www.eia.gov/	• Pipelines
https://www.epa.gov/	• TRI Basic Data Files

Provide a description of the map layers created or acquired to create the source water protection map below:

Layer	Date Created or Acquired	Description
Community and non-transient, non-community water systems	8/2/2022	NYRWA created layers from parcels of federally-regulated and state-regulated community water systems as well as non-transient, non-community water systems.
Transient, non-community water systems	8/2/2022	NYRWA created layer from parcels of transient, non-community water systems.
Elevation and slopes data	4/10/2022	Elevation and slope data calculated by NYRWA using 1-meter cell size digital elevation models derived from 2015-2016 Light Imaging Detection and Ranging (LiDAR) data from the New York Office of Information Technology Services.
Watersheds	8/26/2022	NYRWA derived the New Lebanon HUC-12 watersheds from NRCS 12-digit HUC-12 watershed dataset.
Sand and gravel well data and bedrock well data	8/30/2022	Compiled and mapped by NYRWA from NYS DEC Water Well Contractors data, USGS Site Inventory Database, and study by Lafleur & DeSimone (1991).
Sand and gravel aquifers	11/24/2021	Mapped by Steven Winkley, P.G. using detailed surficial geologic mapping and interpretation of subsurface data from water wells and monitoring wells.
Bedrock geology	11/12/2020	Compiled using GIS by Steven Winkley, P.G. bassed upon a number of published and unpublished mapping sources listed in the plan.
Public water supply protection areas	7/12/2022	Using ArcGIS, NYRWA mapped a one-mile dissolved buffer around community water systems and a 1,500-foot dissolved buffer around non-transient, non-community systems.
Private/Commercial/Institutional (PCI) wastewater permitted facilities	9/12/2022	NYRWA inventoried and mapped private/commercial/institutional (PCI) wastewater permits using the NYS DEC's Permit Applications - Search Wizard.
Permitted mines	2/2/2022	NYRWA searched the online New York State DEC's Mined Land Reclamation database and checked against the DECinfo Locator.
Stormwater Discharge from Industrial Activity	11/23/2020	WASTEQUIP MANUFACTURING COMPANY LLC is listed as a multi-sector general permit facility.
Active petroleum bulk storage facilities	10/19/2020	NYRWA inventoried regulated NYSDEC petroleum bulk storage facilities using the online database. This was checked online against the DECinfo Locator.
Higher risk land uses	9/16/2022	NYRWA used property classification codes from parcel mapping to identify land uses that may pose a higher risk of contamination.
Groundwater-related historical spills	5/19/2022	NYRWA searched the online New York State DEC's spills database for groundwater-related spills in New Lebanon.

2.3 Create a Potential Contaminant Source Inventory

Fill out the potential contaminant source inventory table below.

Potential Source	Contaminant(s) of Concern	Protection Area(s) Impacted	Relevant Information
Petroleum Bulk Storage Facilities	Leaks of petroleum or other substances from tanks or spills during delivery or handling.	Critical area	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.	Critical area	Regulated by NYSDEC. All active smaller discharges to groundwater are covered under general permits.
Sand and Gravel Pits	Accidental leaks of petroleum or clandestine dumping.	Critical area	Regulated by NYSDEC. Information on mines can be found at: https://www.dec.ny.gov/cfmx/extapps/MinedLand/search/ mines/
Vehicle Maintenance Shops	Solid and hazardous wastes that are handled and generated.	Critical area	Depending upon the type and amount of wastes, hazardous waste regulations are likely required to be followed. More information can be found at: https://www.dec.ny.gov/docs/permits_ej_operations_pdf/vehiclemaint.pdf
Cemeteries	Research indicates levels of bacteria, metals (e.g. arsenic), and nutrients have been found to be elevated in groundwater near cemeteries.	Critical area	One of the most recent studies in the United States can be downloaded at: https://doi.org/10.3133/sir20185120

3.1 Identify Protection and Management Methods & 3.2 Develop an Implementation Strategy Timeline

Fill in the implementation strategy timeline below, including identified protection and management methods:

Priority Issue	Targeted Potential Contaminant Source(s)	Goal	Protection Method and/or Management Method	Potential Cost	Potential Funding Sources	Project Leader and Partnerships Needed	Implementation Timing
Potential Contaminants	Nitrate	Continually identify the current status of water supply resources and potential threats.	Acquisition and review of monitoring information from regulated public water systems.	NL CAC Volunteer and NYRWA Hours	NA	Columbia County DOH, NYRWA, NL CAC	2024-2026
	Nitrate, PFAS, others	Continually identify the current status of water supply resources and potential threats.	IWS water well testing	NYS DOH Program hours; NL CAC Volunteer and NYRWA Hours	$6,705 Lab costs/DOH expense; $30,000 ARPA grant funding.	NYS DOH; NL CAC NYRWA	2021-2025
	Industrial wastes	Continually identify the current status of water supply resources and potential threats.	Monitoring and Reporting	NL CAC Volunteer and NYRWA Hours		NYS DOH; NYRWA; NL CAC; NYS DEC	2021-2025
Water Quality in the Routes 20 and 22 Business District	Deicing Materials	Recommend and implement protection strategies on an ongoing basis in order to protect water resources.	Engage NYS DOT with respect to road salt contamination and winter road management practices in New Lebanon.	NL CAC Volunteer and NYRWA Hours	NA	NYS DOT, NYS DEC, NYRWA, Town of NL, CAC	2024-2027
	Septic Loadings	Recommend and implement protection strategies on an ongoing basis in order to protect water resources.	Water and Wastewater feasibility study in the business district	NL CAC Volunteer and NYRWA Hours	Town costs? Grant writer?	Town of New Lebanon; NL CAC NYRWA	2023-2025
Increase Community Support and Grow Awareness of the Importance Water Protection	Various potential household and Land Use products/contaminants.	Recommend and implement protection strategies on an ongoing basis in order to protect water resources.	Trees for Tribs, Children's summer camp programming, Tabling, Water testing, Town Newsletter and Town Website postings, Water well survey, Speaker sessions.	Town of New Lebanon; NL CAC Volunteer and NYRWA Hours	Approximately $1,000 Town annual budget contribution; Volunteer contributions.	Town of New Lebanon, NL CAC, NYS DOH, Columbia Land Conservancy, NYRWA	2018 - 2027, ongoing.
Assess Potential Drinking Water Impacts Resulting from Climate Hazards	Flooding, Drought and other impacts to water supply.	Recommend and implement protection strategies on an ongoing basis in order to protect water resources.	Participation in Climate Smart Communities program, DWSP2 Application & Designation, Develop a Hazard Mitigation Plan and Climate Vulnerability Assessment, Trees for Tribs, Tabling, Speaker sessions.	Town of New Lebanon; NL CAC Volunteer and NYRWA Hours	?	Cornell Cooperative Extension Service in Columbia County, NL CAC , Town of New Lebanon, NYS DOH, NYS DEC Columbia County, NYRWA,	2018 - 2027, ongoing.
Critical Environmental Areas	Land Use contaminants.	Continually identify the current status of water supply resources and potential threats.	Two CEAs were created in 2022 and a third may be considered in 2024.	Town of New Lebanon; NL CAC Volunteer and NYRWA Hours	NA	Town of New Lebanon; NL CAC NYRWA	2022-2024

4.1 Designate a Plan Management Team

Name	Contact Information	
	E-mail	Relevant Affiliation(s)
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Steve Powers	nlcac.powers@gmail.com	Climate Smart Task Force, Chair; CAC, Member; Zoning Rewrite Committee, Member; New Lebanon Town Board Member.
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Use the table below to document the Plan Management strategy for keeping the DWSP2 Plan up to date:	
Plan Management Summary	
Item	**Status**
Designate a Plan Management Team	Complete
Determine progress report frequency 12 Months	Complete
Share progress reports	In Process
Review and share the plan	Complete
Verification from NYS DOH and DEC for completeness	In Process
Create a revision schedule	Complete

Use the table below to track updates and revisions to the DWSP2 Plan. Use the notes section to detail changes made in each update and/or revision:		
Update/Revision Tracker		
Report	**Date**	**Notes**
First report:		
Update/Revision 1		
Update/Revision 2		
Update/Revision 3		
Update/Revision 4		
Update/Revision 5		
Update/Revision 6		
Update/Revision 7		
Update/Revision 8		

Appendix B

Full Size Map Figures

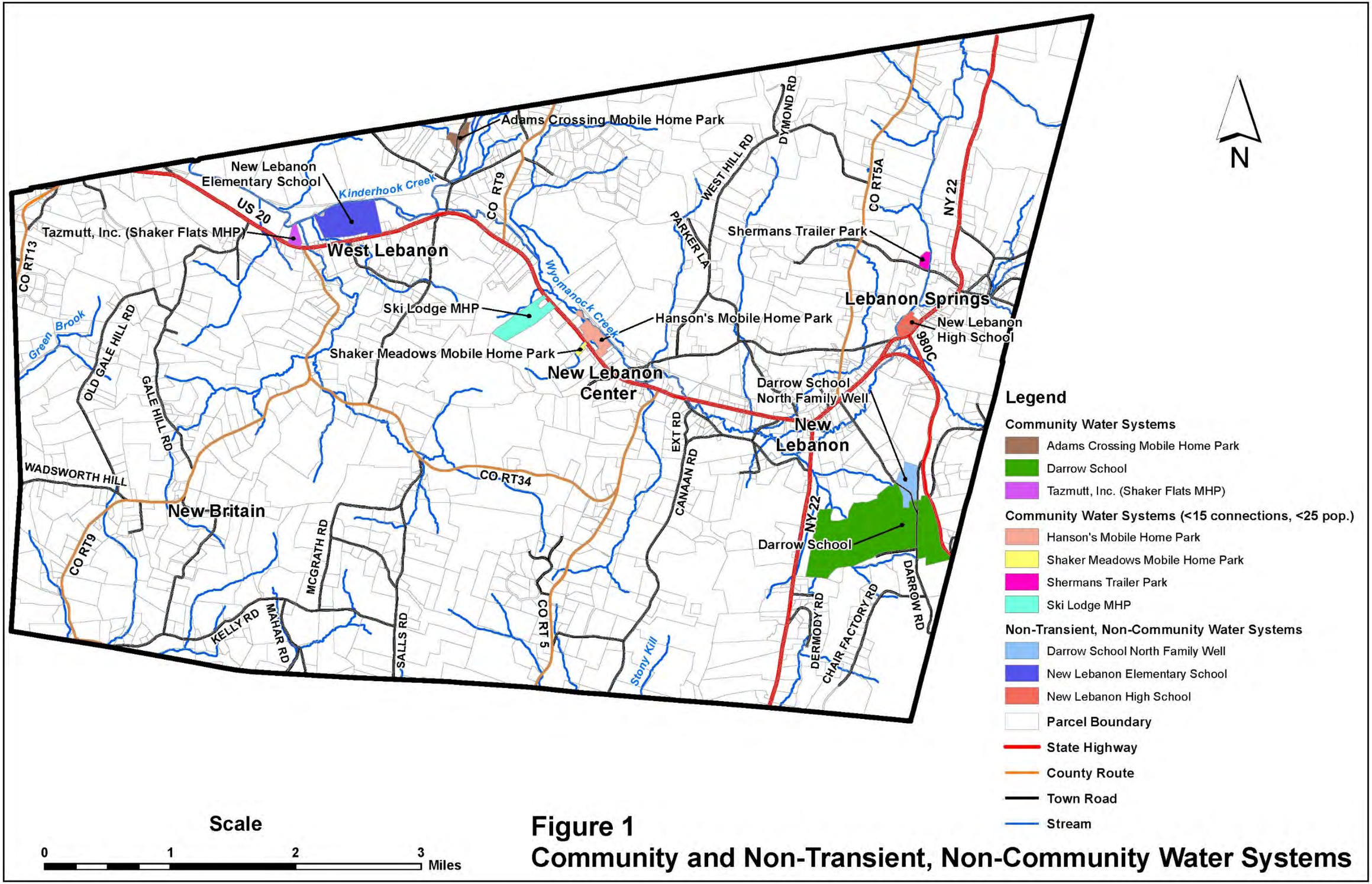


Figure 1
Community and Non-Transient, Non-Community Water Systems

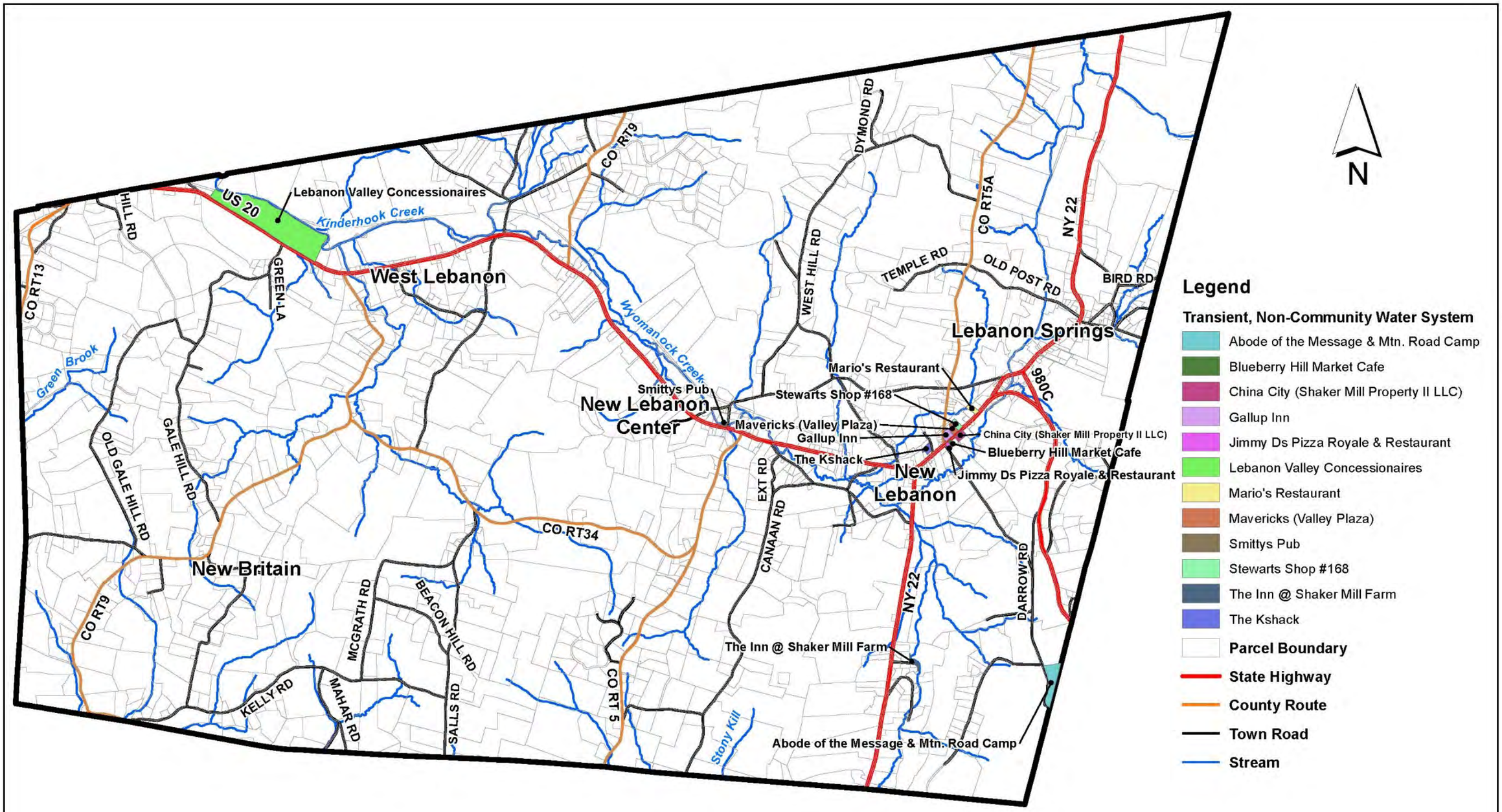
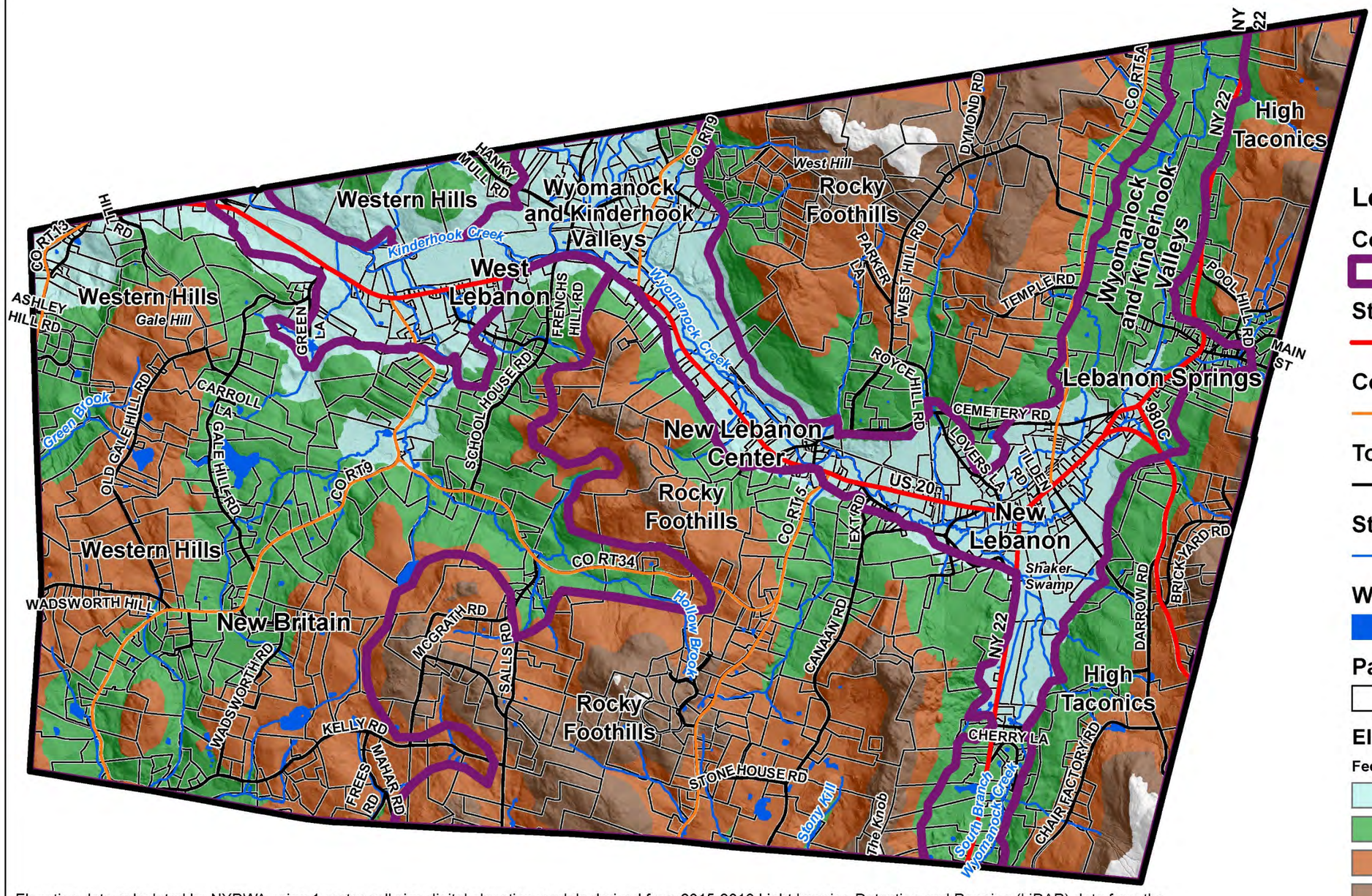


Figure 2
Transient, Non-Community Water Systems



Legend

- Conservation Area Boundary
- State Highway
- County Route
- Town Road
- Stream
- Water Body
- Parcel Boundary

Elevation

Feet above sea-level

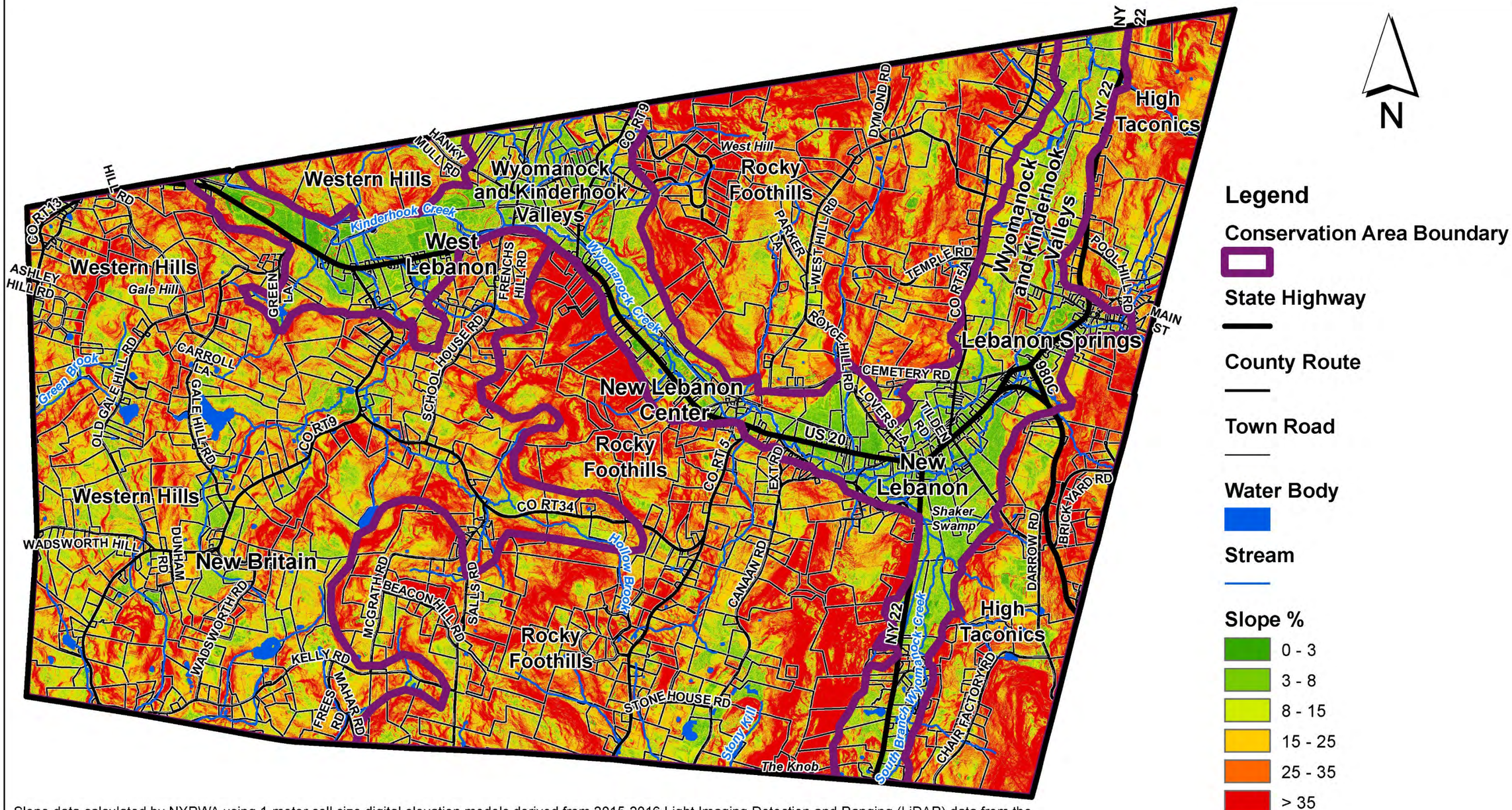
- 590 - 750
- 750 - 1,000
- 1,000 - 1,250
- 1,250 - 1,500
- 1,500 - 1,750

Elevation data calculated by NYRWA using 1-meter cell size digital elevation models derived from 2015-2016 Light Imaging Detection and Ranging (LiDAR) data from the New York Office of Information Technology Services. Stream data is from the USGS National Hydrography Dataset, roads are from the NYSDOT Roadway Inventory System Geodatabase, 2022 parcel boundaries provided by the Columbia County Real Property Tax Service, conservation areas digitized from the 2017 National Resource Conservation Plan for the Town of Lebanon.

Scale

0 1 2 3 Miles

Figure 4
Physiography and Topography

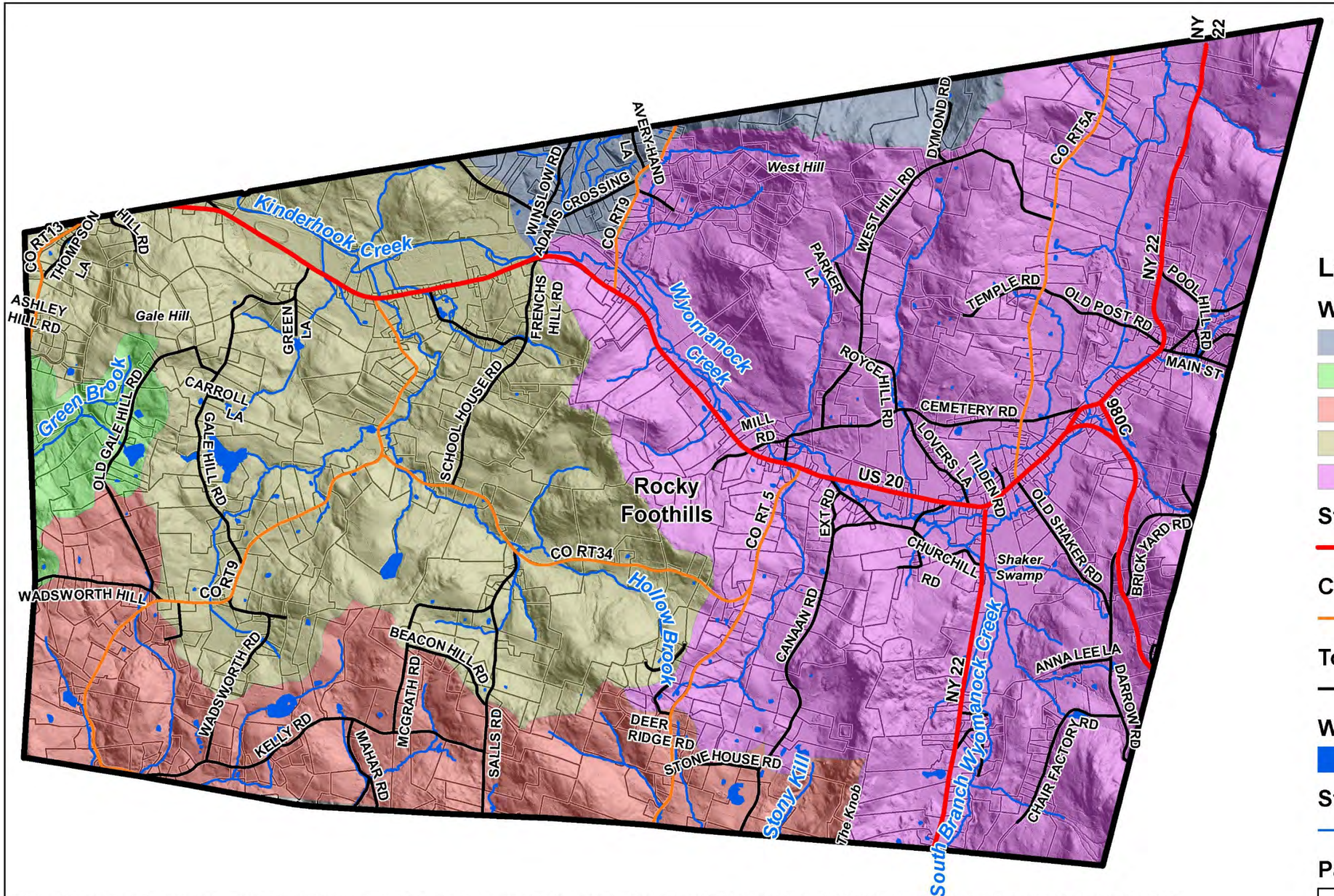


Slope data calculated by NYRWA using 1-meter cell size digital elevation models derived from 2015-2016 Light Imaging Detection and Ranging (LiDAR) data from the New York Office of Information Technology Services. Stream data is from the USGS National Hydrography Dataset, roads are from the NYSDOT Roadway Inventory System Geodatabase, 2022 parcel boundaries provided by the Columbia County Real Property Tax Service, conservation areas digitized from the 2017 National Resource Conservation Plan for the Town of Lebanon.

Scale

0 1 2 3 Miles

Figure 5
Town of New Lebanon Slopes



Legend

Watershed

- Black River-Kinderhook Creek
- Green Brook-Kinderhook Creek
- Stony Kill
- Tackawasick Creek-Kinderhook Creek
- Wyomanock Creek

State Highway

County Route

Town Road

Water Body

Stream

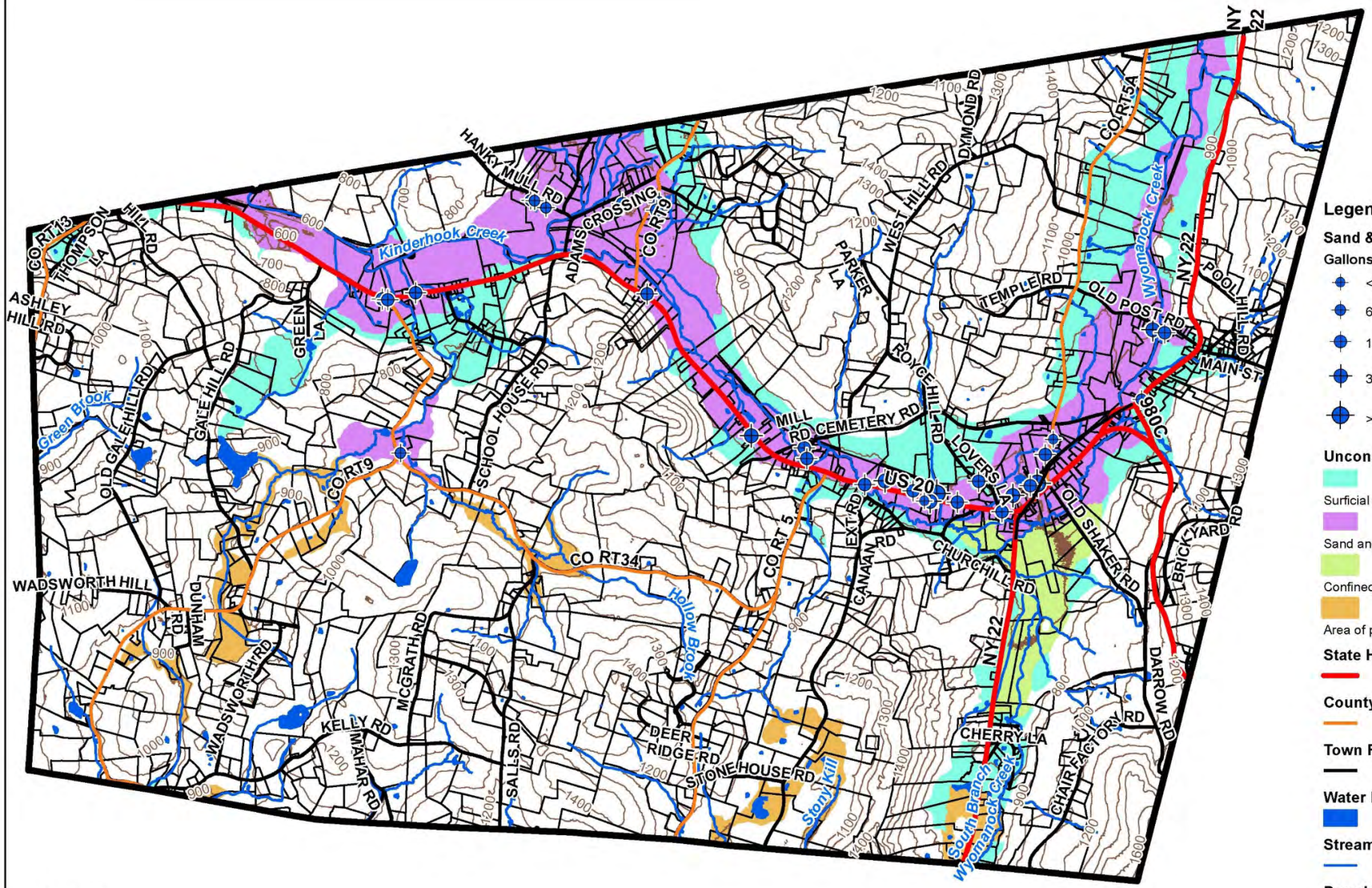
Parcel Boundary

Watershed boundaries from the National Hydrography Dataset by 12-digit Hydrologic Unit. Stream data is from the USGS National Hydrography Dataset, roads are from the NYSDOT Roadway Inventory System Geodatabase, 2022 parcel boundaries provided by the Columbia County Real Property Tax Service, conservation areas digitized from the 2017 National Resource Conservation Plan for the Town of Lebanon.Stream data is from the USGS National Hydrography Dataset, roads are from the NYSDOT Roadway Inventory System Geodatabase, 2022 parcel boundaries provided by the Columbia County Real Property Tax Service, conservation areas digitized from the 2017 National Resource Conservation Plan for the Town of Lebanon.

Scale

0 1 2 3 Miles

Figure 6
Watersheds



Legend

Sand & Gravel Well Data (Label is Depth/Screen/Yield)

Gallons per minute

- <= 5
- 6 - 10
- 12 - 25
- 30 - 50
- > 50

Unconsolidated (Sand & Gravel) Aquifers

Surficial sand and gravel with a limited thickness and/or silty texture

Sand and gravel at land surface locally underlain by a confined sand and gravel aquifer

Confined aquifer - stratified sand and gravel may locally found beneath finer sediments

Area of potential sand and gravel for which no well data exists

State Highway

County Route

Town Road

Water Body

Stream

Parcel Boundary

100' Topographic Contour (using LiDAR data)

—1200—

About This Map:

This map shows the occurrence of unconsolidated (sand and gravel) aquifers. These aquifers typically produce higher water well yields than bedrock sources.

How This Map Was Made:

Sand and gravel aquifer boundaries were mapped by Steven Winkley, P.G. of the NY Rural Water Association using detailed surficial geologic mapping and interpretation of subsurface data from water wells and monitoring wells.

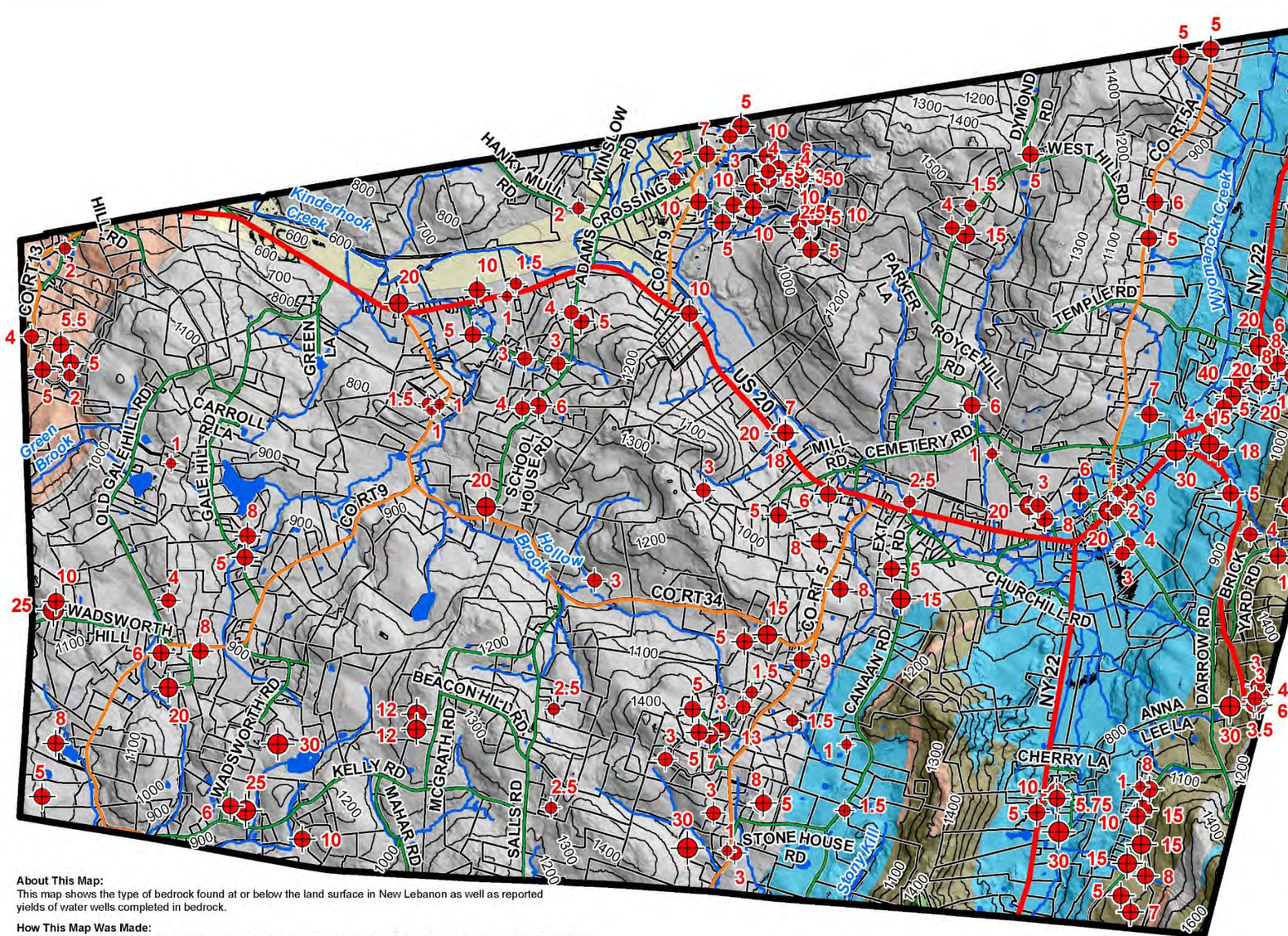
GIS base map datasets used by NYRWA include the USGS National Hydrography Dataset, the NYSDOT Roadway Inventory System Geodatabase, New York Office of Information Technology Services Classified LiDAR Tiles, and tax parcel boundaries provided by the Columbia County Real Property Tax Service.

Well data was compiled and plotted by Steven Winkley, P.G. of the NY Rural Water Association using data from the NYSDEC Water Well Contractors Program, the USGS Site Inventory System, and a study by LaFleur & DeSimone (1991).

Scale

0 1 2 3 Miles

Figure 7
Unconsolidated Aquifers



Legend

Bedrock Water Well Yield

Gallons per minute

- <= 1
- 1.5 - 2.5
- 3 - 4
- 5 - 10
- 12 - 20
- 25 - 40

Bedrock Geology

- Quaternary (bedrock not mapped)
- Walloomsac Formation
- Stockbridge Formation
- Austerlitz/Nassau Phyllite
- Rensselaer Graywacke
- Metavolcanic rock

State Highway

County Route

Town Road

Water Body

Stream

Parcel Boundary

Topographic Contour (using LiDAR data)

1200

About This Map:
This map shows the type of bedrock found at or below the land surface in New Lebanon as well as reported yields of water wells completed in bedrock.

How This Map Was Made:
The bedrock geology of the Town of New Lebanon, NY, was compiled using GIS by Steven Winkley, P.G. of the NY Rural Water Association. A number of published and unpublished mapping sources listed below were digitized and utilized in this effort.

Fisher, D.W., 2006, The Rise and Fall of the Taconic Mountains – A Geological History of Eastern New York: Black Dome Press Corp., 184 p.

Fisher, D.W., Isachsen, Y.W., and L.V. Rickard, 1970, Geologic Map of New York, Hudson-Mohawk Sheet: New York State Museum and Science Service, Map and Chart Series No. 15.

Fisher, D.W., 196(?), Draft Geologic Map of the Canaan Quadrangle, N.Y.-MASS., 1:24,000 Series: New York State Geological Survey, Open File number 1gG1701.

Fisher, D.W., 196(?), Draft Geologic Map of the East Canaan Quadrangle, N.Y.-MASS., 1:24,000 Series: New York State Geological Survey, Open File number 1gG1707.

Radcliffe, N.M., 1978, Reconnaissance Bedrock Geologic Map of the Pittsfield West Quadrangle and part of the Canaan Quadrangle, Berkshire County, Massachusetts and Columbia County, New York: U.S. Geological Survey, Miscellaneous Field Studies Map MF-980.

Zen, E-an, Goldsmith, R., Ratcliffe, N.M., Robinson, P., and R.S. Stanley, 1983, Bedrock Geologic Map of Massachusetts: U.S. Geological Survey.

Well data was compiled and plotted by Steven Winkley, P.G. of the NY Rural Water Association using data from the NYSDEC Water Well Contractors Program, the USGS Site Inventory System, and a study by LaFleur & DeSimone (1991).

Figure 8
Bedrock Geology & Well Yields

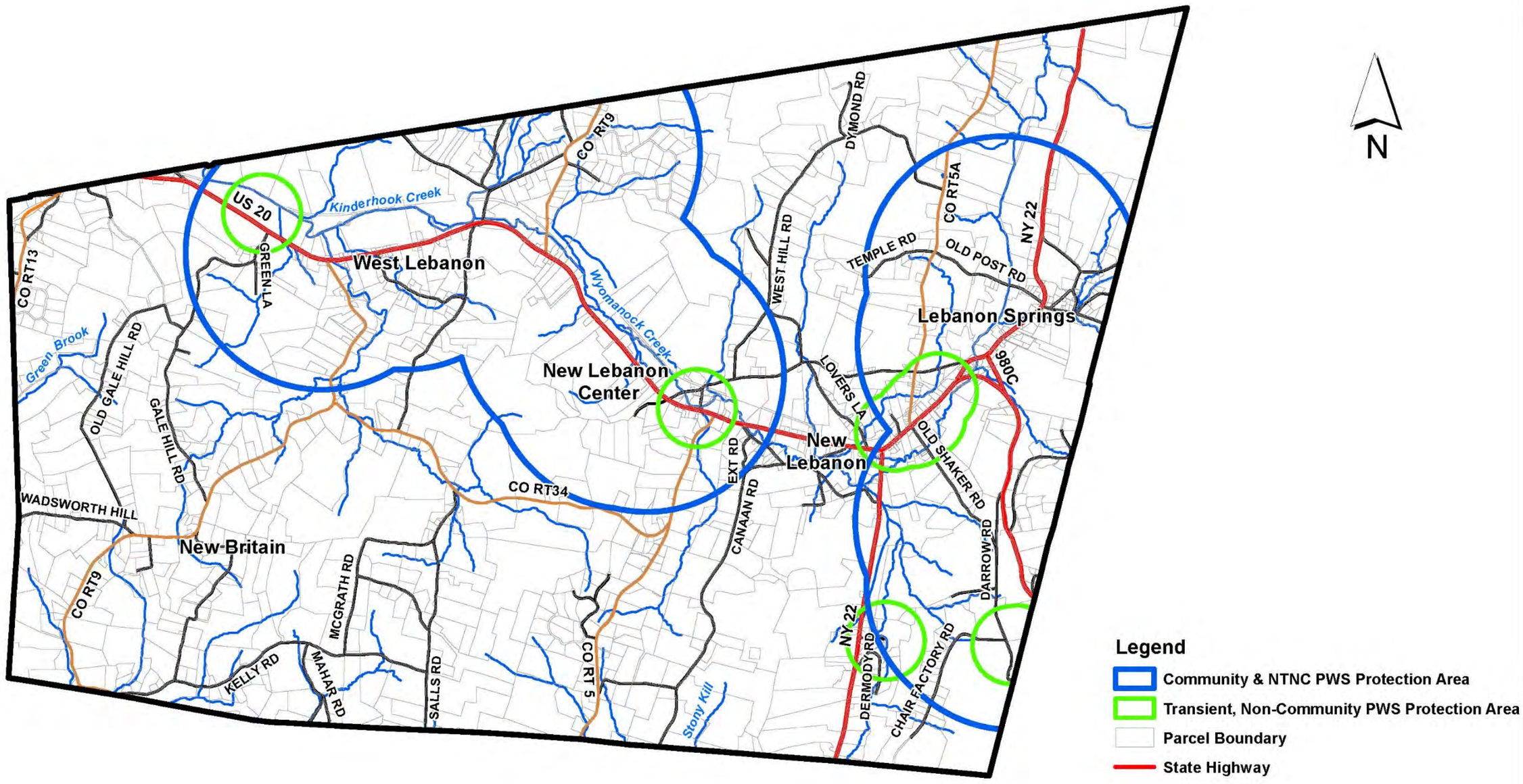


Figure 9
Public Water Supply (PWS) Protection Areas

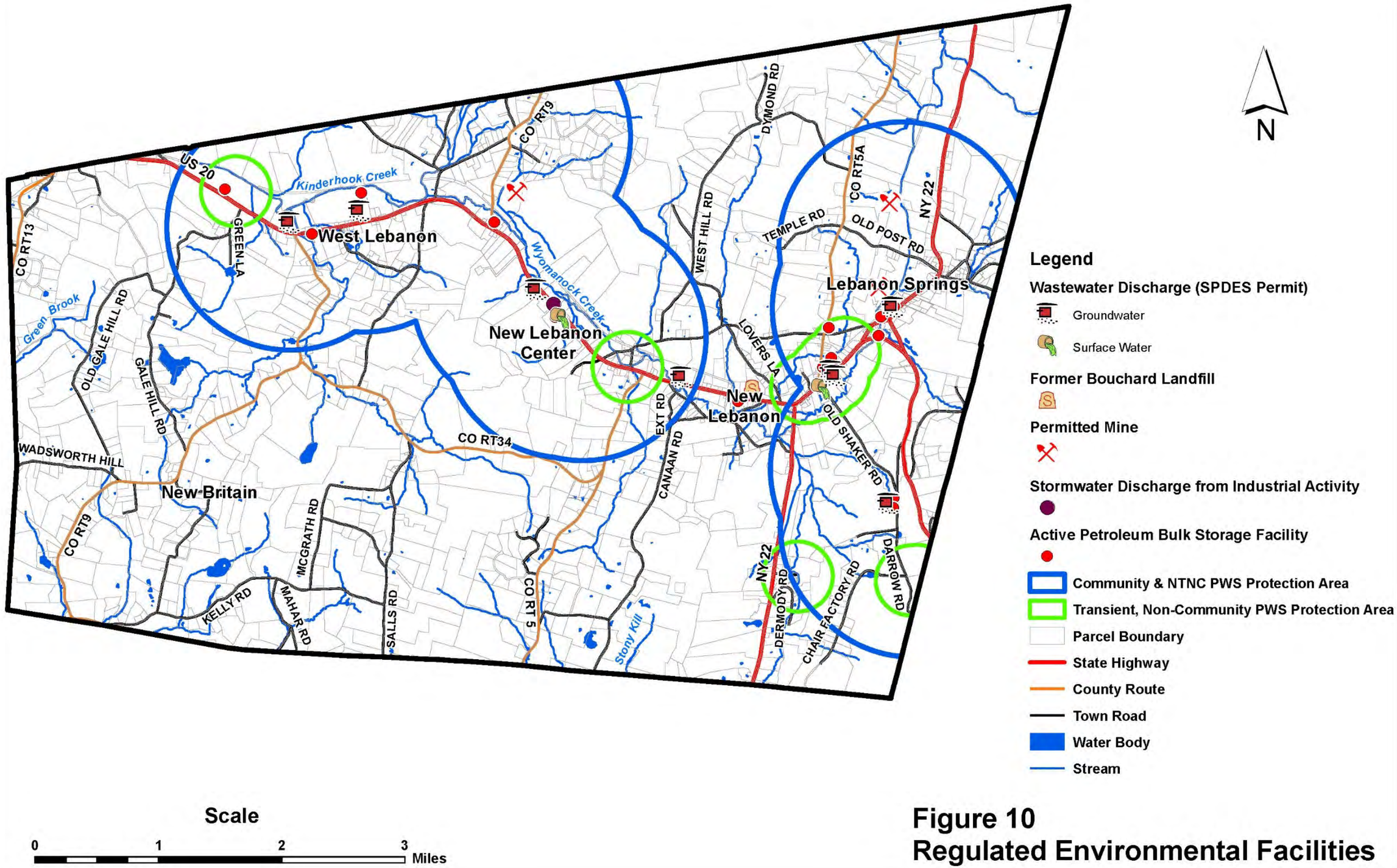


Figure 10
Regulated Environmental Facilities

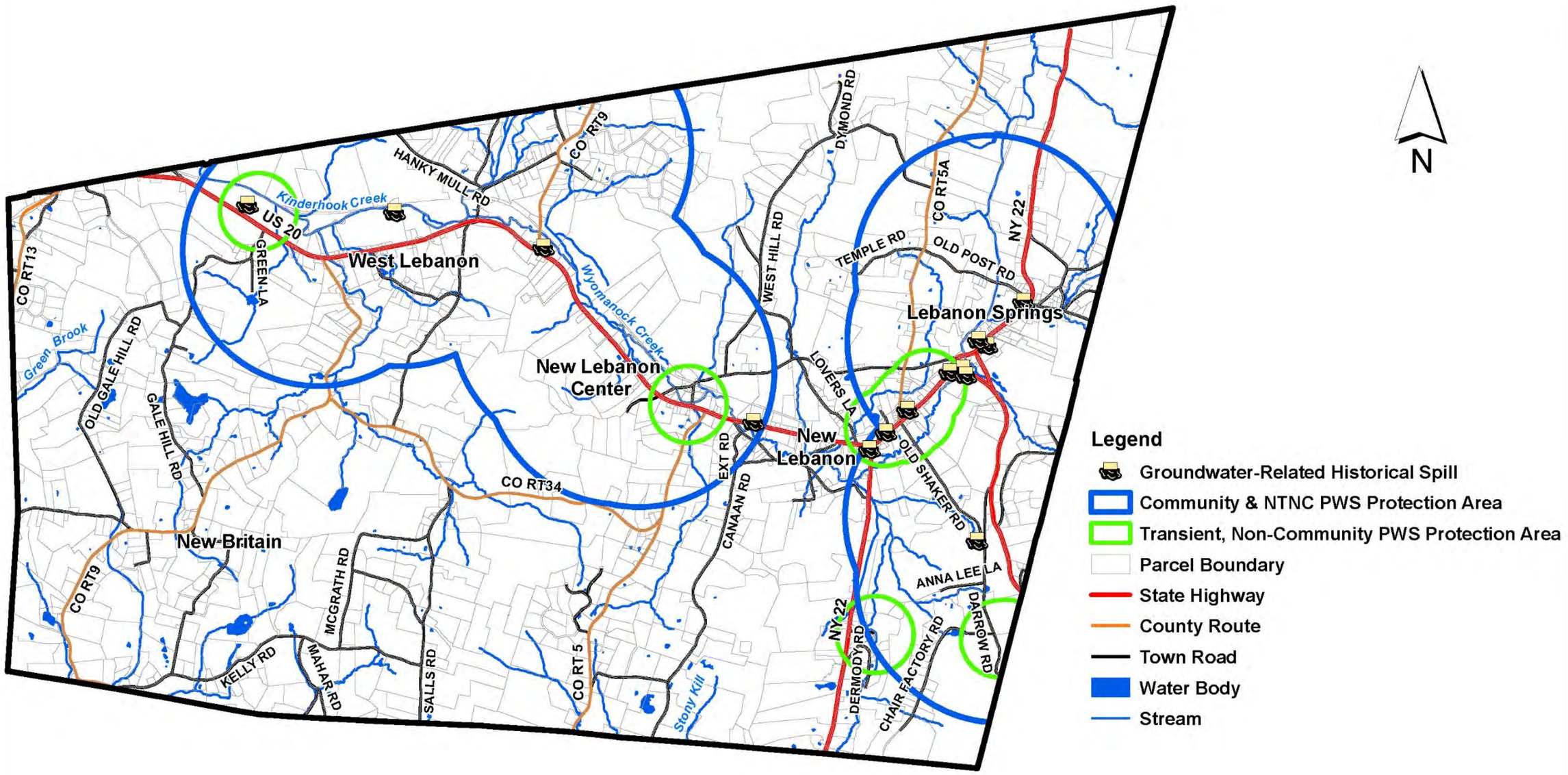


Figure 11
Historical Groundwater-Related Spills

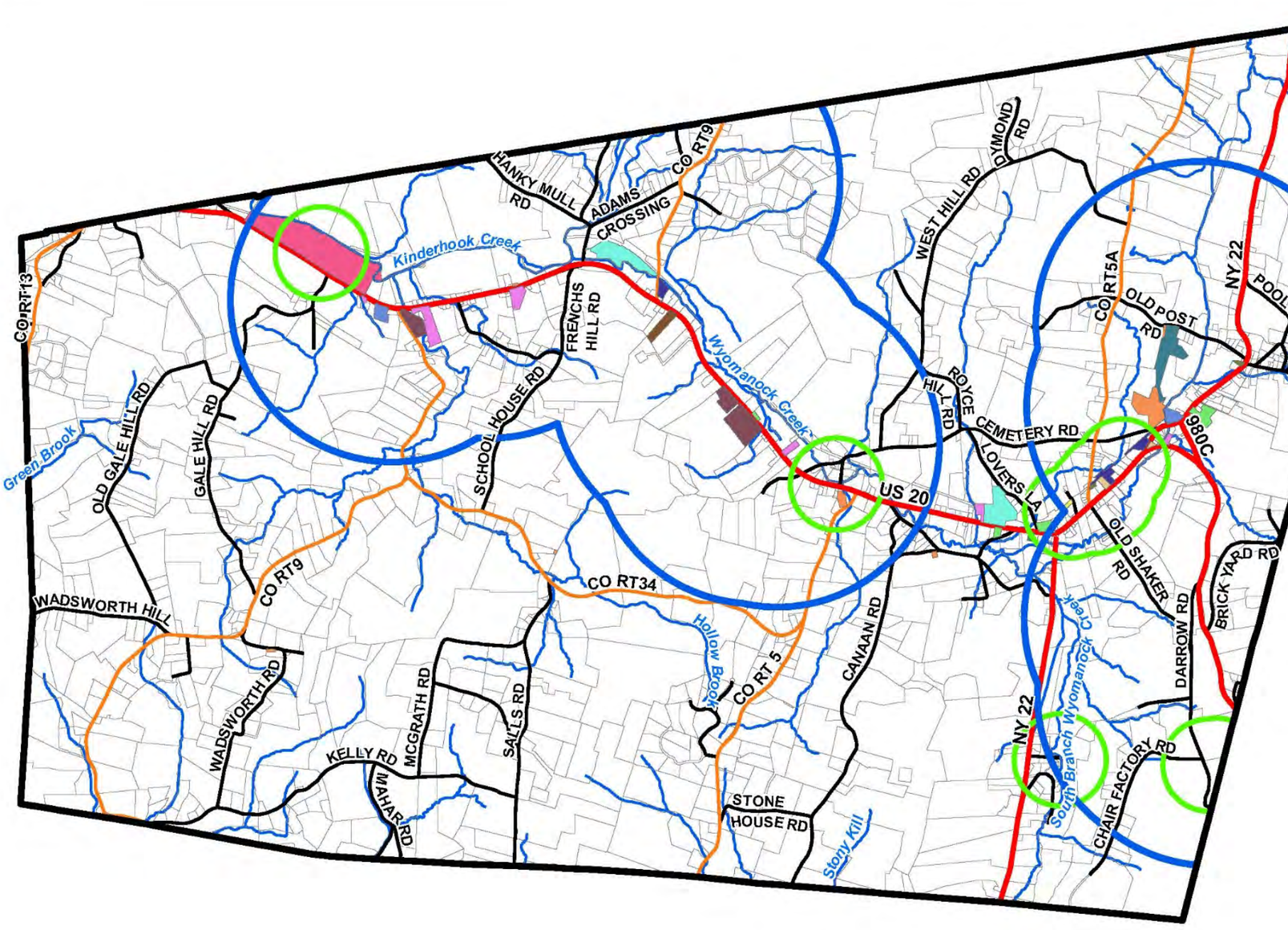
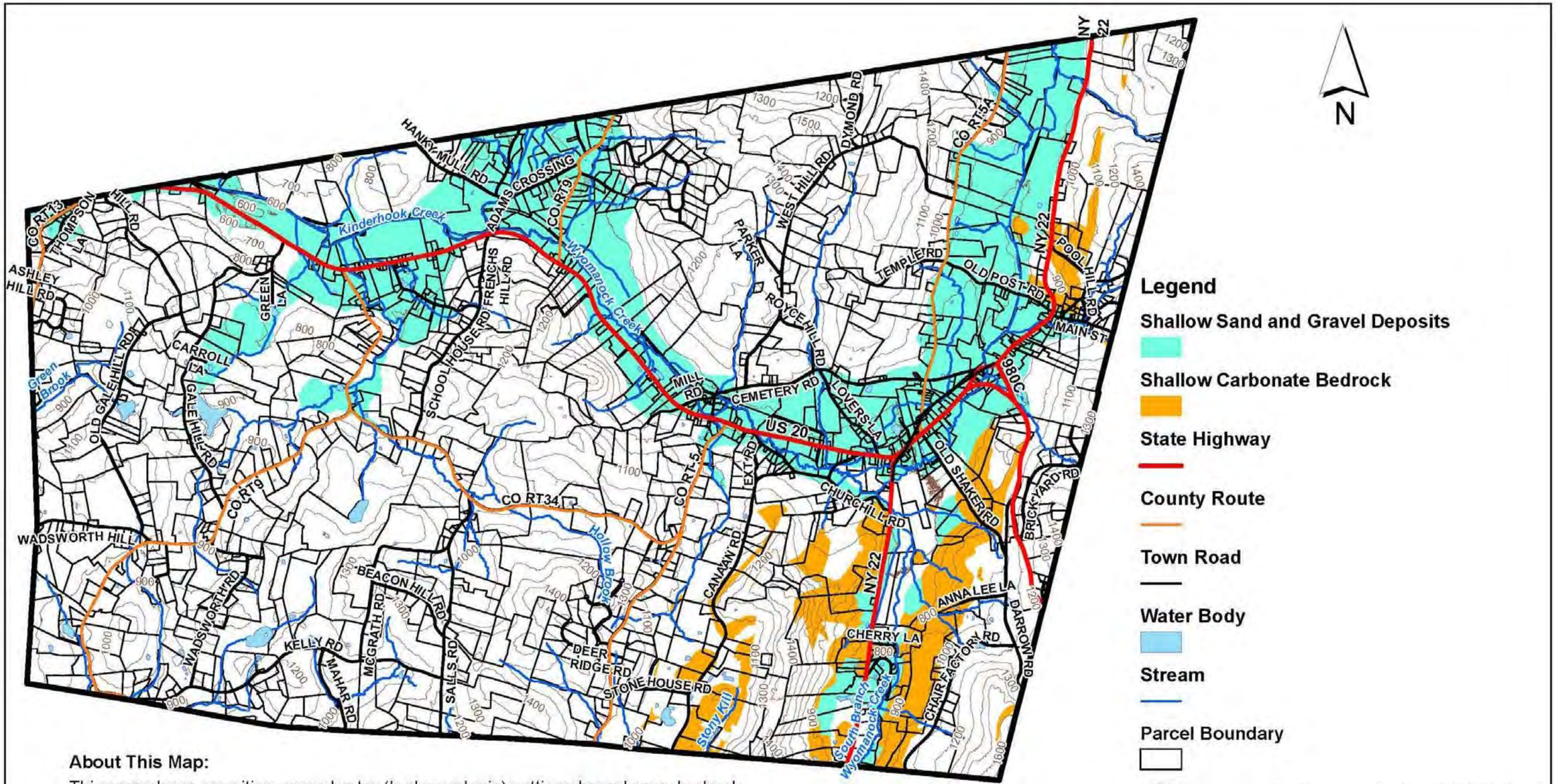


Figure 12
Higher Risk Land Uses



About This Map:

This map shows sensitive groundwater (hydrogeologic) settings based upon bedrock, surficial geology, and aquifer mapping completed by Steven Winkley, P.G. of NY Rural Water Association.

Scale

0 1 2 3 Miles

Legend

- Shallow Sand and Gravel Deposits
- Shallow Carbonate Bedrock
- State Highway
- County Route
- Town Road
- Water Body
- Stream
- Parcel Boundary
- 100' Topographic Contour (using LiDAR data)

Figure 13
Sensitive Hydrogeologic Settings