Preliminary Engineering Report

Water District No. 1 Evaluation

Prepared for

Town of Greenwich

2 Academy Street

Greenwich, New York

July 2021

Barton&Loguidice

Water District No. 1 Evaluation
Town of Greenwich, Washington County

Preliminary Engineering Report

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Prepared for:

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EXECUTIVE SUMMARY

The Town of Greenwich does not currently have public water available to its businesses and residents. Public interest in municipal water has been raised and the Town is eager to grow its commercial district. It is difficult to attract business owners when there is no municipal water available. This leaves potential business owners wary of bringing their business to the Town for fear of dealing with the risks of water contamination and poor yields that can occur with wells. This could potentially limit the Town's future growth. It has also been noted that some current business owners do not drink their well water because of existing aesthetic qualities and fear of possible contamination. Barton & Loguidice, D.P.C. (B&L) was retained by the Town of Greenwich to complete this Preliminary Engineering Report (PER) to investigate the feasibility to bring public water to the project area and to estimate associated capital and user costs.

An existing 8-inch water main, operated and maintained by the Village of Greenwich, is located near the project area on NY Route 29 for potential use.

Four (4) potential alternatives were evaluated.

- Alternative: No Action
- Alternative 1: Town installs new tank and connects to the Village of Greenwich water system.
- Alternative 2: Town installs new well, treatment facility, and tank.
- Alternative 3: Town installs new well, treatment facility, and tank and connects to Village of Greenwich water system for backup water supply.

Alternative 1 is the recommended project. The proposed project includes a connection to the existing 8-inch Village water main, approximately 15,800 linear feet of 8-inch ductile iron pipe (DIP) water main, 183,000 gallon (178,000 gallon capacity) water storage tank and associated valves and piping, and a 125 gallon per minute (gpm) booster pump station to fill the water storage tank. It is assumed there would be an Inter-Municipal Agreement (IMA) between the Village of Greenwich and the Town of Greenwich for operations and maintenance. The estimated total recommended project capital cost for the recommended project is $6,910,000. The estimated annual user cost for the typical Equivalent Dwelling Unit (EDU), if funding is received, is estimated to be $430.97.

ABBREVIATIONS

ADD	Average daily demand
BMP	Best Management Practice
C	Celsius
CCI	Construction Cost Index (ENR)
cfs	Cubic feet per second
CT	concentration x time
DBP	Disinfection byproducts
DEC	New York State Department of Environmental Conservation
DO	Dissolved oxygen
DOC	Dissolved organic carbon
DOH	New York State Department of Health
DOT	New York State Department of Transportation
DWSRF	Drinking Water State Revolving Fund
ECL	Environmental Conservation Law
EDU	Equivalent Dwelling Unit
EFC	New York State Environmental Facilities Corporation
ENR	Engineering News-Record
EPA	United States Environmental Protection Agency
F	Fahrenheit
fps	Feet per second
gpd	Gallons per day
GML	General Municipal Law
gpm	Gallons per minute
HAA	Haloacetic acid
HAB	Harmful algal bloom
HGL	Hydraulic Grade Line
hp	Horsepower
HPGN	High Precision Geodetic Network (1998)
IUP	Intended Use Plan
ISO	Insurance Services Office
LF	linear feet
MCL	Maximum contaminant level
MC-LR	Microcystin-LR
MHI	Median Household Income
MGD	Million gallons per day

ABBREVIATIONS (cont'd)

NAD83	North American Datum (1983)
NAVD88	North American Vertical Datum (1988)
NPSHa	Net positive suction head available
NPSHr	Net positive suction head required
NYSOPRHP	New York State Office of Parks, Recreation, and Historic Preservation
OMB	Office of Management and Budget
PAC	Powdered activated carbon
PACl	Polyaluminum chloride
PHD	Peak hourly demand
PER	Preliminary Engineering Report
ppm	parts per million
psig	Pounds per square inch (gauge)
Q	Volumetric flow rate (gpm, MGD)
SEQR	State Environmental Quality Review
SPDES	State Pollutant Discharge Elimination System
SUVA	Specific ultraviolet absorbance
SWPPP	Storm Water Pollution Prevention Plan
TDH	Total dynamic head
THM	Trihalomethane
TOC	Total organic carbon
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

1.0 INTRODUCTION

1.1. Authorization

On January 12, 2021 the Town of Greenwich retained the services of Barton & Loguidice, D.P.C. (B&L) to prepare an engineering report to evaluate the feasibility of bringing municipal water to the Town and constructing a new water distribution main along NYS Route 29 from Lincoln Avenue to the Middle Falls Bridge and up NYS Route 40 to the intersection with County Route 77. This report describes different alternatives for the Town to acquire municipal water for its residents and commercial district in the area described above.

1.2. Project Background

The Town of Greenwich is in the southwestern quadrant of Washington County, New York. Nearby Communities consist of the Town of Easton to the south, the Village of Schuylerville to the west, the Town of Argyle to the north, and the Village of Greenwich to the east. Figure 1-1 illustrates the Town's geographic position within Washington County and New York State.

The proposed distribution main, located entirely within the Town of Greenwich, would bring public water to approximately 60 properties along NYS Route 29 and 48 properties along NYS Route 40. The Town is eager to grow its commercial district. It is difficult to attract business owners when there is no municipal water available. This leaves potential business owners wary of bringing their business to the Town for fear of dealing with the risks of potential water contamination and poor yields that can occur with wells. This limits the Town's growth. It has also been noted that some current business owners do not drink their well water because of existing aesthetic qualities and fear of possible contamination.

This study includes an evaluation of alternatives to bring public water to the Town in an effort to make the area more attractive for business development and provide a reliable water source to its community.

1.3. Scope of Work

This PER examines the alternatives to provide community source water, storage, and distribution improvements to a select area of the Town. The four (4) alternatives considered for a comprehensive capital improvement project (CIP) in this study include:

- Alternative: No Action
- Alternative 1: Town installs new tank and connects to the Village of Greenwich water system with booster pump station.
- Alternative 2: Town installs new well, treatment facility, and tank.
- Alternative 3: Town installs new well, treatment facility, and tank and connects to Village of Greenwich water system with booster pump station for backup water supply.

The scope of this study considers an average and maximum daily demand of approximately 52,000 gallons per day (gpd) and 103,000 gpd, respectively, based on equivalent dwelling unit (EDU) assessments of the proposed water district.

The scope of services also includes:

1. Kick-off and scoping meeting
2. Archeological services
3. Environmental services
4. Preliminary design services
    a. Existing conditions
    b. Proposed future flow estimates
    c. Proposed improvements
    d. Permitting requirements
    e. Opinions of capital and operations/maintenance costs
    f. Funding summary
    g. Anticipated schedule

2.0 PROJECT BACKGROUND AND HISTORY

2.1. Site Information

2.1.1. Location

The Town of Greenwich is located in the southwest quadrant of Washington County, New York. Nearby Communities consist of the Town of Easton to the south, the Village of Schuylerville to the west, the Town of Argyle to the north, and the Village of Greenwich to the east. Figure 1-1 illustrates the Town's geographic position within Washington County and New York State.

2.1.2. Land Use of Project Area

Land use within the Town of Greenwich is primarily agricultural, residential, and commercial in nature. The area within the proposed project area is primarily residential and commercial.

2.1.3. Geologic Conditions

Preliminary screening conducted through the USDA Web Soil Survey identified the type of soils found in the project area. The soils throughout the project area primarily consists of Hoosic gravelly sandy loam, 0 to 3 percent slopes (HoA, 43.5%), Nassau shaly silt loam, undulating through hilly (NAC, 30.6%), and Oakville loamy fine sand, 0 to 5 percent slopes (OaB, 13.2%) (Web Soil Survey, 2021). A full list of soils located within the project area is provided in Appendix A. The depth to bedrock in the project area ranges from approximately 1.5 to over 6.5 feet, and the depth to the water table ranges from zero (at the surface) to over 6.5 feet. A geotechnical investigation will be completed as part of the project's preliminary design to obtain more accurate information regarding subsurface conditions on site. A topographic map of the project area is provided in Figure 2-2. A complete list of the soils located within the project area, the depth to the water table, and flooding frequency is included in Appendix A.

2.1.4. Environmental Resources

The New York State Department of Environmental Conservation Environmental Resource Mapper (ERM) was reviewed for the presence of natural resources within the project area. No NYSDEC-mapped wetlands are located within 100 feet of the project area. Numerous wetlands mapped by the United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) are located within the project area. NYSDEC mapped streams, including Hartshorn Brook and two (2) tributaries of Batten Kill intersect the water main along State Route 29 and State Route 40. A copy of the NYSDEC Environmental Resource Mapper Results is included in Appendix D. Figure 2-3 of the mapped wetlands and waterbodies can be found at the end of this report.

The USFWS Information for Planning and Consultation (IPaC) website reported no federally threatened or endangered species within the project area. The ERM reported no state threatened, endangered, species of special concern, or significant natural communities for the project area. A copy of the IPaC report can be found in Appendix C.

2.1.5. Floodplain Considerations

A portion of the new water transmission main is located within the FEMA-mapped 100-year floodplain (Zone A) of Hartshorn Brook along State Route 29. Additionally, a portion of the new water transmission main is located within the FEMA-mapped 100-year floodplain (Zone AE) and designated floodway of the Batten Kill on State Route 29. The FEMA Flood Insurance Rate Maps (FIRMs) for the area are provided in Figure 2-4.

2.1.6. Agricultural Districts

The project area is not located within the vicinity of any properties that are part of Washington County Agricultural Districts. Additionally, no active agricultural land is noted adjacent to the proposed water main. Figure 2-5 shows the location of agricultural districts in relation to the project area.

2.1.7. Cultural and Historical Resources

A preliminary screening through the New York State Historic Preservation Office (SHPO) Cultural Resource Information System (CRIS) indicated that a portion of the project area is within archaeologically sensitive areas. Additionally, four (4) eligible National Register Building Listings are located along the proposed new water main on State Route 29. Project information was submitted to SHPO on May 26, 2021. Correspondence with SHPO is an ongoing process. Appropriate actions will be taken to fulfill the requests from SHPO to ensure that the proposed project will not result in an adverse impact on historic properties, including archaeological and/or historic resources.

2.2. Ownership and Service Area

2.2.1. Ownership

The Town of Greenwich does not currently have a public water facility.

2.2.2. Population Trends and Projected Growth

Census data indicates that the Town of Greenwich saw an increase (1.0%) in population between 2000 and 2010, and a decrease (-2.4%) in population between 2010 and 2019, summarized in Table 2-1. However, the Town is going to see significant growth within the next 30 years. 20% growth was assumed from now (2021) to 2051. The estimated population in 2051 is 5,786.

Table 2-1: Town Population Trends

Municipality	2000 Population	2010 Population	2019 Population	30-Year Projected Growth (2051)
(T) Greenwich	4,896	4,941 1.0%	4,822 -2.4%	5,786 20%

2.2.3. Community Engagement

Community engagement will be a project priority. The Town will host public information meetings to deliver information throughout the project and provide an opportunity for resident feedback.

3.0 EXISTING CONDITIONS

3.1. Water Source

3.1.1. Overview

The proposed water main along NYS Routes 29 and 40 in the Town of Greenwich would provide public water to the identified properties along these routes. Figure 2-1 illustrates the location of the approximately 15,800 linear foot proposed water main. The introduction of public water to the Town will strengthen their commercial district and attract businesses to the area.

3.1.2. Source Water Quality

The Town does not currently have a public water service. The properties obtain their water from individual groundwater wells. The Town is interested in expanding their commercial district and municipal water is attractive to potential business owners. It has been noted that some current business owners do not drink their well water because of existing aesthetic qualities and fear of potential contamination. Eliminating private wells alleviates the fear of dealing with potential water contamination and poor yields that can occur.

3.2. Equivalent Dwelling Units EDUs and Water Usage

The estimated number of equivalent dwelling units (EDU) and the associated water demands are summarized in Table 3-1. An EDU is defined as a typical single-family home having an average population of 2.4 persons per household according to 2010 census data. All tax parcels located within the project area were allocated a specific number of EDUs based on the property classification of that parcel as established by the New York State Office of Real Property Services. The EDU assessment completed for the Town of Greenwich is in Appendix B.

Table 3-1: Estimated Water Demands

Service Area	Estimated Existing/Proposed EDUs	Theoretical Avg. Daily Demand, ADD (GPD)	Theoretical Max Daily Demand, MDD (GPD)	Theoretical Peak Hourly Demand, PHD (GPH)
(T) Greenwich Commercial District (NYS Route 29 &40)	313	51,600	103,200	8,600

*Water demands are theoretical and are based on an EDU assessment of the Town's Commercial district along NYS Routes 29 & 40.

**ADD = 51,600 gallons per day EDU, MDD = ADD x 2, PHD = ADD x 4.

3.3. Reasonable Growth

As discussed earlier in this report, current population trends do not project significant population growth for the Town of Greenwich. However, the Town would like to attract potential business owners and become a more attractive, commutable suburb of the City of Saratoga by bringing the reliability of municipal water to the project area. The Town also has

interest in constructing a senior living complex within this area. Public water would bring in more commercial users to expand the Town's commercial district. There is a good amount of vacant land in the Town that is available for development and the Town expects growth within the next 15 to 30 years.

4.0 SOURCE ALTERNATIVES ANALYSIS

The following source alternatives were investigated:

- Alternative: No Action
- Alternative 1: Town installs new tank and connects to the Village of Greenwich water system with booster pump station.
- Alternative 2: Town installs new well, treatment facility, and tank.
- Alternative 3: Town installs new well, treatment facility, and tank and connects to Village of Greenwich water system with booster pump station for backup water supply.

4.1. No Action

Under the No Action alternative, no changes would be made in the Town. This alternative would not address the installation of a new water system and therefore not provide the community with public water. The Town would be in the same position it is in and would not be able to grow their commercial district and attract new business owners. Due to the Town's desire to grow their commercial district, this alternative is not recommended and was not investigated further.

4.2. Alternative 1: Town installs new tank and connects to the Village of Greenwich water system

This alternative proposes the installation of approximately 15,800 linear feet of 8-inch diameter water main along NYS Routes 29 & 40 in the Town. This main would connect to the existing 8-inch diameter ductile iron pipe (DIP) Village water main near the intersection of NYS Route 29 & Lincoln Avenue. The new water main will generally be placed within the road right-of-way, off the shoulder. A 183,000 gallon (178,000 gallon operating capacity) water storage tank is proposed as well as a 125 gpm booster pump station to fill the tank. Sizing calculations for the tank and booster station are provided in Appendix E and F.

4.2.1. System Overview

Distribution System

The proposed distribution system will include the following public infrastructure:

- Connection to the existing 8-inch diameter Village water main;
- Approximately 15,800 linear feet of 8-inch diameter DIP water main
- Twenty seven (27) hydrants spaced no more than 600 feet apart;
- Twenty (20) mainline valves spaced no more than 800 feet apart;
- Approximately 114 long and short side service laterals extended to the highway right-of-way or easement boundary, comprised of 3/4-inch type K copper pipe and curb stop and box;
- 183,000 gallon (178,000 gallon operating capacity) water storage tank and associated valves and piping;
- 125 gpm booster pump station to fill the water storage tank.

Once the new system is constructed, tested, chlorinated, and placed in service, the project area residents will be able to connect to their curb stop, noting that vacant parcels will not receive a service. Residents will be responsible for the one-time costs of 3/4-inch service installation on private property, connection to their household plumbing system, and abandonment of their private well in accordance with NYSDOH requirements.

A new 183,000 gallon (178,000 gallon operating capacity) water storage tank and 125 gpm pump station will be constructed. The pump is designed to provide 66 feet of head at 125 gpm. Tank and pump sizing calculations are shown in Appendix E and F, respectively.

4.2.2. Land Requirements

Two (2) areas were evaluated for the proposed tank site. They are illustrated with base elevations on Figure 4-1. The Town would need to acquire land for the tank installation for either of the areas.

Potential tank site 1 would need to acquire land from the Martins Good of South Burlington that owns the Hannaford on the property. Potential tank site 2 would need to acquire land from a private landowner.

4.2.3. Schedule and Constructability

Construction of this alternative can be accomplished off-line while the existing facility remains in operation. This approach reduces the risk to public health and water interruption during construction. The anticipated project schedule is as follows:

Funding submission:	Summer 2021
Funding awarded:	Winter 2021
Design:	Winter/Spring 2022
Award bids:	Winter 2022
Construction start:	Spring 2023
Construction completion:	Spring 2024

4.2.4. Project Capital Cost

The estimated project capital cost for Alternative 1 would be $6,910,000. Appendix G contains a detailed estimate. Contingency budget, engineering, legal, and administrative fees, and inflation costs were considered to determine the cost of constructing this project in 2023.

4.3. Alternative 2: Town installs new well, treatment facility, and tank

This alternative proposes the installation of a new Town owned well and treatment facility. The installation of approximately 15,800 linear feet of 8-inch diameter water main along NYS Routes 29 & 40 in the Town. The new water main will generally be placed within the road right-of-way, off the shoulder. A 183,000 gallon (178,000 gallon operating capacity) water storage tank is proposed as well. Alternative 2 is illustrated in Figure 4-3.

4.3.1. System Overview

Distribution System

The proposed distribution system will include the following public infrastructure:

- Approximately 15,800 linear feet of 8-inch diameter DIP water main;
- Twenty seven (27) hydrants spaced no more than 600 feet apart;
- Twenty (20) mainline valves spaced no more than 800 feet apart;
- Approximately 114 long and short side service laterals extended to the highway right-of-way or easement boundary, comprised of 3/4-inch type K copper pipe and curb stop and box;
- 183,000 gallon (178,000 gallon operating capacity) water storage tank and associated valves and piping;
- New Town owned well site with treatment facility.

Once the new system is constructed, tested, chlorinated, and placed in service, the project area residents will be able to connect to their curb stop, noting that vacant parcels will not receive a service. Residents will be responsible for the one-time costs of 3/4-inch service installation on private property, connection to their household plumbing system, and abandonment of their private well in accordance with NYSDOH requirements.

The Town would need to drill a new well and install a small treatment facility. Seven (7) potential well sites were identified in the Town. They are shown on Figure 4-2. A more detailed analyses should be conducted to gain more information on each area. An analyses of environmental databases to determine if petroleum or chemical spills have

been reported to regulators, soil survey data, existing well database review, discussions with Town officials on potential contaminant sources, and review of past hydrogeologic studies is recommended as part of any future analysis.

A new 183,000 gallon (178,000 gallon operating capacity) water storage tank would also be constructed. Tank sizing calculations are shown in Appendix E.

4.3.2. Land Requirements

Seven (7) areas were identified for a potential well site and treatment facility for the Town. They are illustrated on Figure 4-2. Potential sites D and E were selected as the best sites because of their location in the Town. Land would need to be acquired by the

Town from private landowners for these locations. Further analyses also would need to be done to determine how suitable each location is for a new well and treatment facility.

Two (2) areas were evaluated for the proposed tank site. They are illustrated with base elevations on Figure 4-3. The Town would need to acquire land for the tank installation for any of the areas.

Potential tank site 1 would need to acquire land from the Martins Good of South Burlington that owns the Hannaford on the property. Potential tank site 2 would need to acquire land from a private landowner.

4.3.3. Schedule and Constructability

Construction of this alternative can be accomplished off-line until everything is completed as the residents are currently connected to private wells. This approach reduces the risk to public health and water interruption during construction. The anticipated project schedule is as follows:

Funding submission:	Summer 2021
Funding awarded:	Winter 2022
Design:	Winter/Spring 2022
Award bids:	Winter 2022
Construction start:	Spring 2023
Construction completion:	Spring 2024

4.3.4. Project Capital Cost

The estimated project capital cost for Alternative 2 would be $8,400,000. Appendix G contains a detailed estimate. Contingency budget, engineering, legal, and administrative fees, and inflation costs were considered to determine the cost of constructing this project in 2023.

4.4. Alternative 3: Town installs new well, treatment facility, and tank and connects to Village of Greenwich water system with booster pump station for backup water supply

This alternative proposes the installation of a new Town owned well and treatment facility as well as the installation of approximately 15,800 linear feet of 8-inch diameter water main along NYS Routes 29 & 40 in the Town. The new water main will generally be placed within the road right-of-way, off the shoulder. This main would have an emergency connection to the existing 8-inch DIP Village water main and a 125 gpm booster pump station near the intersection of NYS Route 29 & Lincoln Avenue. A 183,000 gallon (178,000 gallon operating capacity) water storage tank is proposed. Alternative 3 is illustrated in Figure 4-4.

4.4.1. System Overview

Distribution System

The proposed distribution system will include the following public infrastructure:

- Approximately 15,800 linear feet of 8-inch diameter DIP water main;
- Twenty seven (27) hydrants spaced no more than 600 feet apart;
- Twenty (20) mainline valves spaced no more than 800 feet apart;
- Approximately 114 long and short side service laterals extended to the highway right-of-way or easement boundary, comprised of 3/4-inch type K copper pipe and curb stop and box;
- 183,000 gallon (178,000 gallon operating capacity) water storage tank and associated valves and piping;
- New Town owned well site with treatment facility.
- Emergency connection to the existing 8-inch Village water main and 125 gpm booster pump station.

Once the new system is constructed, tested, chlorinated, and placed in service, the project area residents will be able to connect to their curb stop, noting that vacant parcels will not receive a service. Residents will be responsible for the one-time costs of 3/4-inch service installation on private property, connection to their household plumbing system, and abandonment of their private well in accordance with NYSDOH requirements.

The Town would need to drill a new well and install a small treatment facility. Seven (7) potential well sites were identified in the Town. They are shown on Figure 4-2. A more detailed analyses should be conducted to gain more information on each area. An analyses of environmental databases to determine if petroleum or chemical spills have been reported to regulators, soil survey data, existing well database review, discussions with Town officials on potential contaminant sources, and review of past hydrogeologic studies.

A new 183,000 gallon (178,000 gallon operating capacity) water storage tank would also be constructed. The pump is designed to provide 66 feet of head at 125 gpm and would

be used for an emergency connection to the Village only. Tank and pump sizing calculations are shown in Appendix E and F, respectively.

4.4.2. Land Requirements

Seven (7) areas were identified for a potential well site and treatment facility for the Town. They are illustrated on Figure 4-2. Land would need to be acquired by the Town from private landowners for all the locations. Further analyses also would need to be done to determine how suitable each location is for a new well and treatment facility.

Two (2) areas were evaluated for the proposed tank site. They are illustrated with base elevations on Figure 4-4. The Town would need to acquire land for the tank installation for any of the areas.

Potential tank site 1 would need to acquire land from the Martins Good of South Burlington that owns the Hannaford on the property. Potential tank site 2 would need to acquire land from a private landowner.

4.4.3. Schedule and Constructability

Construction of this alternative can be accomplished off-line until everything is completed as the residents are currently connected to private wells. This approach reduces the risk to public health and water interruption during construction. The anticipated project schedule is as follows:

Funding submission:	Summer 2021
Funding awarded:	Winter 2022
Design:	Winter/Spring 2022
Award bids:	Winter 2022
Construction start:	Spring 2023
Construction completion:	Spring 2024

4.4.4. Project Capital Cost

The estimated project capital cost for Alternative 3 would be $8,920,000. Appendix G contains a detailed estimate. Contingency budget, engineering, legal, and administrative fees, and inflation costs were considered to determine the cost of constructing this project in 2023.

5.0 SUMMARY AND COMPARISON OF ALTERATIVES

5.1. Feasible Alternatives Summary

Four (4) alternatives were considered for creating a water district in the Town of Greenwich. The first alternative was considered the "no action" alternative. Although this alternative would have the lowest initial capital cost, it would not address the Town's commitment to expanding their commercial district and ability to provide municipal water to potential business owners. Town's residents would still be on private wells which could lead to risks of water contamination and poor yields.

Alternative 1 considered the Town's connection to the Village of Greenwich water system. This alternative would require a 125 gpm booster pump station, an 183,000 gallon (178,000 gallon operating capacity) water storage tank with approximately 2,000 linear feet of associated piping, and 15,800 linear feet of 8-inch water main. This would provide water to the Town but would require the Town to purchase water from the Village. It would also require an agreement and cooperation from the Village to allow the connection into their system. The tank will require land acquisition as well.

Alternative 2 considered the installation of a Town well and treatment facility to provide water to the Town. This would also require an 183,000 gallon (178,000 gallon operating capacity) water storage tank with approximately 2,000 linear feet of associated piping. This alternative would require the Town to form a water department and monitor and maintain their wells and water system. The well and tank sites would require land acquisition.

Alternative 3 considered the Town installation of a well and treatment facility, as well as connection to the Village of Greenwich water system for an emergency connection. This alternative also requires an 183,000 gallon (178,000 gallon operating capacity) water storage tank with 2,000 linear feet of associated piping, a 125 gpm booster pump station, and 15,800 linear feet of 8-inch water main. This would require an agreement and cooperation from the Village to allow the connection into their system. It would also require the Town to form a water department and monitor and maintain their wells and water system.

5.2. Non-Monetary Factors for All Alternatives

5.2.1. Existing Habitat Impacts

According to the USFWS IPaC database, the project area is not within the range of any federally listed threatened or endangered species. The NYSDEC ERM reported that the project area is not within the vicinity of any state-listed endangered or threatened species, species of special concern, or any significant natural communities.

5.2.2. Permit Issues

Disturbances to the bed or banks of state-protected streams would likely require an Article 15 permit from the NYSDEC. Temporary or permanent disturbances to federally regulated wetlands or waterbodies would require a Section 404 permit from the USACE and associated Section 401 Water Quality Certification from the NYSDEC.

5.2.3. Wetlands

No NYSDEC Wetlands are mapped within 100 feet of the project area. Several wetlands mapped by the USFWS NWI are located throughout the project area. Hartshorn Brook and two (2) tributaries of Batten Kill intersect the proposed sewer main in multiple locations. Hartshorn Brook intersects the water main along State Route 29 and the two (2) tributaries of Batten Kill intersect the water main along State Route 40. Hartshorn Brook is a Class C stream with C(T) standards, and the two (2) tributaries of Batten Kill are Class C streams with C standards. Mapped waterbodies with A, B, or C(T) standards are protected by NYSDEC under Article 15 of the Environmental Conservation Law. All three (3) streams intersecting the water main drain in to the Batten Kill which ultimately drains into the Hudson River, a navigable waterway regulated by the U.S. Army Corps of Engineers (USACE) under Section 10 of the Rivers and Harbors Act. Due to this direct connection, all three (3) streams within the project area are likely regulated by the USACE under Section 404 of the Clean Water Act as Waters of the United States. Wetlands and surface waters would be delineated during project design to accurately identify their boundaries within the project area.

5.2.4. Cultural and Historic Resources

The project area is partially within an archaeologically sensitive area mapped by SHPO. Additionally, four (4) eligible National Register Building Listings are located along the proposed new water main on State Route 29. Project information was submitted to SHPO on May 26, 2021. Correspondence with SHPO is an ongoing process. Appropriate actions will be taken to fulfill the requests from SHPO to ensure that the proposed project will not result in an adverse impact on historic properties, including archaeological and/or historic resources.

5.2.5. Threatened and Endangered Species

According to the USFWS IPaC database, the project area is not within the range of any federally listed threatened or endangered species. The NYSDEC ERM reported that the project area is not within the vicinity of any state-listed endangered or threatened species, species of special concern, or any significant natural communities

6.0 RECOMMENDED AND SELECTED ALTERNATIVES

6.1. Basis of Selection

6.1.1. Water District No. 1 Evaluation

Of the four (4) potential options that were evaluated to create a water district in the Town of Greenwich, Alternative 1 is the most economical solution that fully meets project goals and is therefore recommended. While this alternative requires an agreement and cooperation from the Village, it provides the Town with the least involvement in their new system while still providing water to their residents. This is also the lowest cost alternative.

6.2. Opinion of Probable Cost

The estimated project cost (in 2023 dollars) for the recommended alternative is $6,910,000. Appendix G shows a more detailed cost estimate breakdown. Figure 4-1 includes a map of the recommended alternative.

7.0 PLAN OF FINANCE

7.1. Funding Opportunities and Rate Impacts

Several funding opportunities are available to ensure that the chosen alternative is affordable for system users. This project is eligible for funding through programs including the NYS Environmental Facilities Corporation (EFC) Drinking Water State Revolving Fund (DWSRF), the USDA Rural Development (RD) Water and Waste Disposal Loan and Grant Program, and various programs under the NYS Consolidated Funding Application (CFA). User costs will vary depending on the amount of funding ultimately awarded to the Town for the project.

7.1.1. NYSEFC

The NYSEFC provides financing for projects involving needed drinking water infrastructure improvements. The DWSRF program through NYSEFC offers interest-free financing for 100% of eligible project costs for municipalities that qualify for hardship. Market-rate or subsidized financing (up to 50% reduced) are also available through the DWSRF if the municipality does not qualify for zero interest financing. In the event of severe financial hardship, municipalities are also eligible for hardship grants. The recommended project meets the eligibility criteria for the DWSRF program; however, based on the scoring listed in the Draft 2021 DWSRF Intended Use Plan, the project is estimated to receive a DWSRF score of 65 points (refer to Appendix H) which in a typical year, is not above the hardship funding and the subsidized interest rate funding line. It is therefore anticipated that the project would not receive subsidized rate financing (i.e., 2.2% interest rate for 30-year loan) if financed through the EFC in consideration of the Town of Greenwich's 2019 ACS MHI of $61,848 and poverty rate of less than 11.3%, which disqualifies it from receiving hardship funding and a subsidized interest rate. Hardship financing and subsidized interest rates are awarded based on a municipality's median household income (MHI) and the DWSRF project scoring criteria.

7.1.2. Water Infrastructure Improvement Act (WIIA) Grant

The project is eligible to apply for a WIIA grant through the EFC. Based on the scope of the project, it may be eligible to receive a maximum 60%, or up to $3,000,000 grant through WIIA.

7.1.3. USDA Rural Development (RD) Water and Environmental Program (WEP)

Rural Development (RD) has funding available for municipal projects for municipalities with a population of 10,000 or less. The funding determination for RD is based on a Target Service Charge (TSC). The TSC for RD is calculated as a percentage of the area's MHI. RD offers loan financing for 38 years and at a reduced interest rate (estimated at 2.5%). If the resulting user charge with RD loan financing is above the TSC, additional grant dollars are available. Depending on median household income, up to $500,000 in

grant dollars are available to each project to reduce the user charge to the TSC. If the resulting user charge with RD loan financing is below the TSC, no additional grant dollars would be available.

7.1.4. USDA RD WEP Grant

The Town is not eligible for a grant through the USDA RD WEP. In order to qualify, the water cost paid per EDU must be at least 1.5% of the median household income for the Town. For the Town to qualify, the cost per EDU would need to be approximately $928 per year (MHI was $61,848 at 2019 census). The Town currently does not have a public water system therefore there are no current costs.

Table 7-1: Funding Eligibility for Major Funding Programs

Program Name	Sponsoring Agency(ies)	Funding Type
Drinking Water State Revolving Loan Fund (Base Funding	New York State Environmental Facilities Corporation (NYSEFC)	
Small Cities Community Development Block Grant Program (CDBG)	Housing and Community Renewal (HCR	Grants to $600,000 for public health projects; grants for $100,000 to $750,000 for projects creating jobs
Rural Utilities Service Water and Wastewater Disposal Loan and Grant Program	U.S. Department of Agriculture – Rural Development (RD)	Low-interest variable rate loans to 38 years; 500k/+ Grants
Government Efficiency-Planning/Implementation	Department of State	Grant with local match
Green Innovations Grant Program (GIGP)	NYSEFC	Grant with local match
Water Quality Grant Program	New York State Department of Conservation (NYSDEC)	Grants, variable dollars
Economic Development Waterfront Revitalization	Empire State Development; Appalachian Regional Commission	Grant program with local match

7.2. Preliminary Funding Analysis

Estimates presented herein are based on the equivalent dwelling units (EDU), as required by the NYS Environmental Facilities Corporation (EFC), which may differ from the Town's typical assessment basis for debt service. The costs below represent estimates of cost to service the debt associated with the recommended alternative and potential funding opportunities through EFC and USDA RD. A preliminary funding analysis of each core funding program and grant opportunity for the Town of Greenwich is included below.

7.2.1. NYSEFC Drinking Water State Revolving Fund (DWSRF) Program

The recommended CIP meets the eligibility criteria for the DWSRF program. Based on the scoring criteria listed in the 2021 Intended Use Plan, the project is estimated to receive DWSRF score of 65 points, which is below the 2021 subsidized interest rate funding line. It is anticipated that the project would likely not receive 0% hardship financing. A preliminary scoring estimate is attached as Appendix P. The Town is eligible for a DWSRF loan at market loan rate.

7.2.2. USDA Rural Development (RD) Water and Environmental Program (WEP)

The proposed project meets the eligibility criteria for the USDA RD WEP program and based on the 2010 MHI should qualify for a 38 year loan with an intermediate category interest rate (currently 1.125%).

7.2.3. WIIA Grant

The project is eligible to apply for a WIIA grant through EFC. Based on the scope of the project, it may be eligible to receive up to 60% or $3,000,000 grant through WIIA. The maximum combined amount that can be awarded between the DWSRF and WIIA programs is $3,000,000.

7.3. Annual User Costs

Table 7-2 summarizes the funding scenarios for the Town and the estimated annual cost per EDU. Scenario 1 includes both an EFC market rate loan and $3M WIIA grant, which is the best funding scenarios as it results in the lowest first year user cost. It is recommended that the Town pursue all grants and finance options to complete the project for the lowest cost per user.

Table 7-2: Annual Cost Summary-No Financing

	Funding Scenario			
	EFC Market Rate Loan + WIIA Grant	EFC Market Rate Loan, No Grant	RD Intermediate Rate Loan + RD Grant	RD Intermediate Rate Loan, No Grant
Project Capital Cost	$ 6,910,000	$ 6,910,000	$ 6,910,000	$ 6,910,000
Maximum Grant Funding	$ 3,000,000	$ -	$ 1,000,000	$ -
Net Project cost to be Financed	$ 3,910,000	$ 6,910,000	$ 5,910,000	$ 6,910,000
Loan Term	30	30	38	38
Interest Rate	3.50%	3.50%	1.125%	1.125%
Annualized Project Cost	$ 134,895.00	$ 238,395.00	$ 199,462.50	$ 233,212.50
Number of EDUs	313	313	313	313
Total First Year User Cost per EDU	$ 430.97	$ 761.65	$ 637.26	$ 745.09
Quarterly First Year User Cost per EDU	$ 107.74	$ 190.41	$ 159.32	$ 186.27

8.0 CONCLUSION

There are a number of reasons motivating the need for creating a water district in the Town of Greenwich. These include the Town's commitment to expanding their commercial district as well as residents not having to deal with potential private well issues such as contamination and low well yield. An analysis of feasible alternatives available to the Town was conducted. This analysis included the logistical, financial, and non-monetary factors applicable for each alternative. An alternative was selected for the project based on its ability to meet the project goals while also remaining the most cost effective for the Town and its residents. Ultimately, it was recommended that the Town undergo a project that includes the construction and implementation of a connection to the existing 8-inch diameter Village water main, approximately 15,800 linear feet of DIP water main, a 183,000 gallon (178,000 gallon operating capacity) water storage tank and associated valves and piping, and a 125 gpm booster pump station to fill water storage tank. The total project cost was equivalent to $5,800,000. The project may be eligible for a $3,000,000 WIIIA grant through EFC. The total first year user cost per EDU, including debt service, would be $430.97, seen in Table 7-2. Pursuing this project would allow the Town to provide its residents and business owners with reliable public water, alleviate private well issues, and expand their commercial district at the most economical cost.

Following the completion of this report, the anticipated project schedule for the proposed rehabilitation project is outlined below:

Project Schedule Milestone Item	Schedule Date
Submit Engineering Report	July 2021
DWSRF Project Listing	July 2021
Environmental Review	Fall 2021
Submit DWSRF funding application to NYSEFC	Fall 2021
Close on Short Term Financing (DWSRF)	Winter 2022
Submit Project Plans and Specs for Review and Approval/ Land Acquisition	Spring 2022
Project Letting/Bidding Phase	Fall 2022
Award Bids	Winter 2022
Issue Notice to Proceed	Spring 2023
Construction Start	Summer 2023
Construction Completion	Spring 2024

8.1. Next Steps

The following regulatory reviews and/or approvals of the rehabilitation project are anticipated and will be obtained during the project design phase:

- New York State Department of Health (NYSDOH) and NYS Environmental Facilities Corporation (EFC) – Engineering Report and Plan Approval.
- The project is expected to require review as a Type 1 action under the State Environmental Quality Review Act (SEQRA). The SEQRA review would involve completion of the Full Environmental Assessment Form and a coordinated review with all potentially involved or interested agencies for the project.
- A Map, Plan & Report (MPR) for district formation

REFERENCES

Department of Health. (n.d.). *State Sanitary Code, 10 NYCRR Part 5, Subpart 5-1.*

Great Lakes - Upper Missisippi River Board of State and Provincial Public Health and Environmental Managers. (2018). *Recommended Standards for Water Works.* Albany: Health Education Services.

Figure

Figure 1-1
Project Location Map

Warren County

Project Location:
Town of Greenwich
Washington County, NY

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Saratoga County

Washington County

Washington County

Proposed Water District #1
Town of Greenwich, NY

State of Massachusetts

Rensselaer County

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Sources:----------

Barton & Loguidice

1 inch = 20,000 feet

Town of Greenwich

Project Location Map

Washington County July 2021 New York

Figure 1-1

Project No. 1587.003

Figure 2-1
Proposed Water Main

Barton & Loguidice

1 inch = 800 feet

Town of Greenwich

Proposed Watermain

Washington County May 2021 New York

Figure 2-1

Project No. 1587.003

Figure 2-2
Topographic Project Location Map

Legend

Proposed Water Transmission Main

Project Area

End of proposed water transmission main

End of proposed water transmission main

Proposed connection to Village of Greenwich water system

Sources: Basemap- USA Topo, 2013; Water Main- B&L, 2021;

Barton & Loguidice

0 500 1,000 2,000 Feet

Town of Greenwich

Topographic Project Location Map

Washington County May 2021 New York

Figure 2-2

Project No. 1587.003

Figure 2-3
Mapped Wetlands and Surface Waters

Legend

- Municipal Boundaries
- Proposed Water Transmission Main
- NYSDEC-Mapped Streams
- NYSDEC-Mapped Wetlands (None in extent)

NWI-Mapped Wetlands

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Riverine

R4SBC

End of proposed water transmission main

PUBHx

PSS1F

PEM1B

PUBFx

Tributary of Batten Kill

R4SBC

PFO1B

PUB/EM1Fh

PSS1Eh

STATE ROUTE 40

GALESVILLE DR

PFO1A

PFO1A

R4SBC

Tributary of Batten Kill

PUBFx

PEM1Bd

PUBHh

PFO1Ed

UNNAMED STREET

FIDDLERS ELBOW RD

Town of Greenwich

MOOREHOUSE LN

MEADER RD

PFO1C

COUNTY RTE 53

STATE ROUTE 29

PFO1C

PFO1C

R5UBH

End of proposed water transmission main

PFO1E

R3UBH

PFO1C

Hartshorn Brook

PUB/SS1Fh

PUBHx

LARK ST

PINEVIEW DR

R3UBH

SHERMAN AVE

LINCOLN AVE

PFO1E

Town of Easton

Proposed connection to Village of Greenwich water system

PUBHx

Sources: Basemap- NYSGPO, 2017; Municipal Boundaries- NYSGPO, 2020; Water Main- B&L, 2021; NYSDEC Resources, 2016; NWI Wetlands, 2018;

Barton & Loguidice

N W E S

0 250 500 1,000 Feet

Town of Greenwich

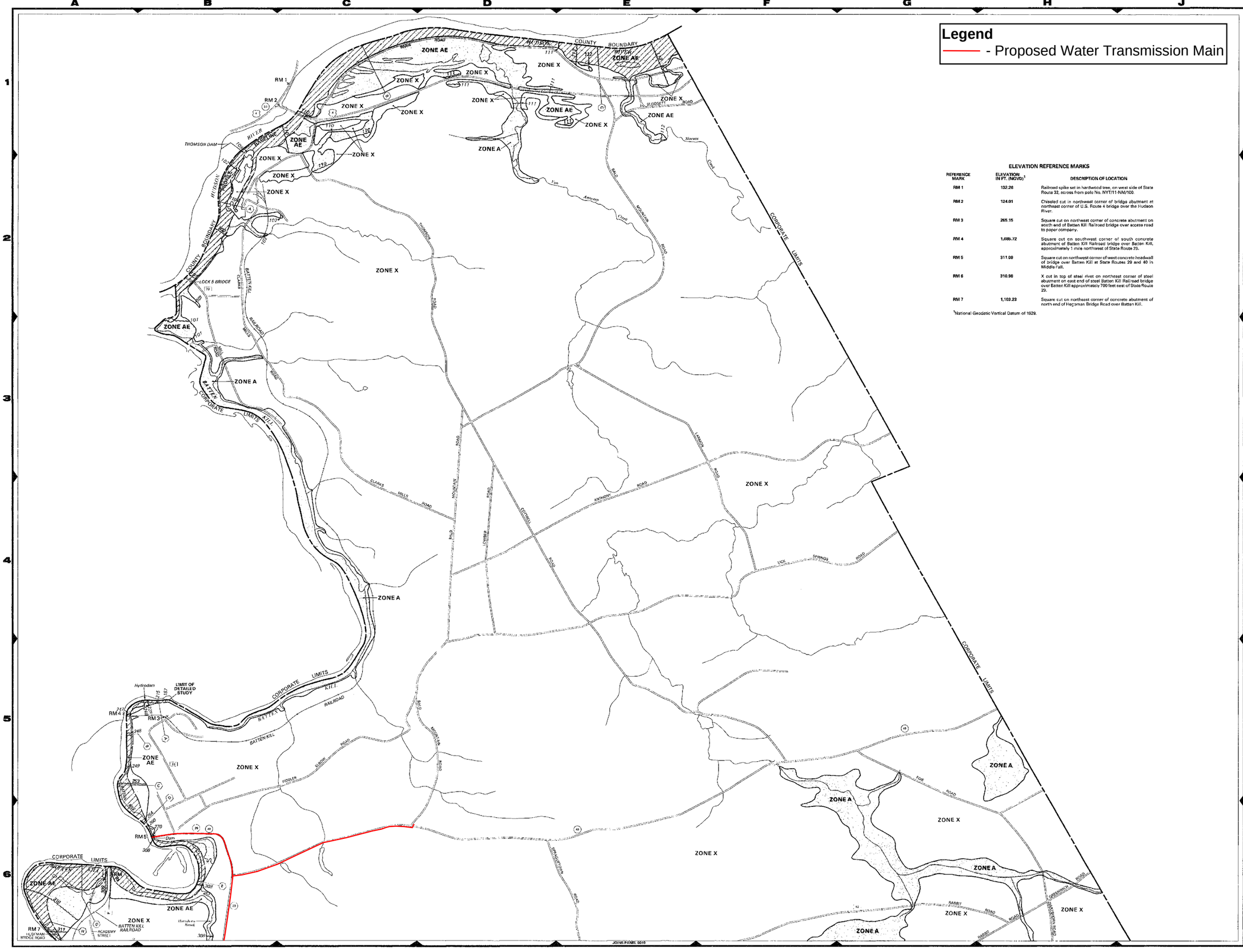
Mapped Wetlands and Surface Waters

Washington County May 2021 New York

Figure 2-3

Project No. 1587.003

Figure 2-4
FEMA Firm Panels



ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION IN FT. (NGVD)[1]	DESCRIPTION OF LOCATION
RM 1	132.26	Railroad spike set in hardwood tree, on west side of State Route 32, across from pole No. NYT/11-NM/100.
RM 2	124.01	Chiseled cut in northwest corner of bridge abutment at northeast corner of U.S. Route 4 bridge over the Hudson River.
RM 3	265.15	Square cut on northeast corner of concrete abutment on south end of Batten Kill Railroad bridge over access road to paper company.
RM 4	1,085.72	Square cut on southwest corner of south concrete abutment of Batten Kill Railroad bridge over Batten Kill, approximately 1 mile northwest of State Route 29.
RM 5	311.09	Square cut on northwest corner of west concrete headwall of bridge over Batten Kill at State Routes 29 and 40 in Middle Falls.
RM 6	310.98	X cut in top of steel rivet on northeast corner of steel abutment on east end of steel Batten Kill Railroad bridge over Batten Kill approximately 700 feet east of State Route 29.
RM 7	1,103.23	Square cut on northeast corner of concrete abutment of north end of Hegeman Bridge Road over Batten Kill.

[1]National Geodetic Vertical Datum of 1929.

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD
- ZONE A — No base flood elevations determined.
- ZONE AE — Base flood elevations determined.
- ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE A99 — To be protected from 100-year flood by federal flood protection system under construction; no base flood elevations determined.
- ZONE V — Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- ZONE VE — Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS
- ZONE X — Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS
- ZONE X — Areas determined to be outside 500-year floodplain.
- ZONE D — Areas in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS

Floodplain Boundary

Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

513 — Base Flood Elevation Line; Elevation in Feet*

(D) — (D) — Cross Section Line

(EL 987) — Base Flood Elevation in Feet Where Uniform Within Zone*

RM 7 x — Elevation Reference Mark

M1.5 — River Mile

*Referenced to the National Geodetic Vertical Datum of 1929

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas. The community map repository should be consulted for possible updated flood hazard information prior to use of this map for property purchase or construction purposes.

Coastal base flood elevations apply only landward of 0.0 NGVD, and include the effects of wave action; these elevations may also differ significantly from those developed by the National Weather Service for hurricane evacuation planning.

Areas of special flood hazard (100-year flood) include Zones A, AE, AH, AO, A99, V, and VE.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

For adjoining map panels see separately printed Map Index.

MAP REPOSITORY

Town Hall, 2 Academy Street, Greenwich, New York 12834 (Maps available for reference only, not for distribution).

INITIAL IDENTIFICATION:
SEPTEMBER 24, 1976

FLOOD HAZARD BOUNDARY MAP REVISIONS:
NONE

FLOOD INSURANCE RATE MAP EFFECTIVE:
JULY 3, 1986

FLOOD INSURANCE RATE MAP REVISIONS:
March 16, 1992 - to add base flood elevations, to change special flood hazard zones, to change some dimensions, to update map format, to add roads and road names, and to reflect updated topographic information.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE
1000 0 1000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

TOWN OF
GREENWICH, NEW YORK
WASHINGTON COUNTY

PANEL 5 OF 15
(SEE MAP INDEX FOR PANELS NOT PRINTED)

PANEL LOCATION

COMMUNITY-PANEL NUMBER
361233 0005 C

MAP REVISED:
MARCH 16, 1992

Federal Emergency Management Agency

JOINS PANEL 0005

JOINS PANEL 0015

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION IN FT. (NGVD)[1]	DESCRIPTION OF LOCATION
RM 8	357.99	X cut on top of hydrant on east side of Abeel Avenue at Greenwich D.P.W. garage.
RM 9	372.21	Square cut on southeast corner of concrete abutment on south side of State Route 29, approximately 150 feet west of mile marker No. 29 1804 1084.
RM 10	377.89	Square cut on northwest corner of north concrete abutment of Ray Road bridge over Batten Kill, approximately 300 feet south of intersection of State Route 29 and Ray Road.
RM 11	380.72	NGS disk, stamped JBF 1 1942, in concrete post on bypass road of State Route 29.
RM 12	415.11	U.S. Geological Survey (U.S.G.S.) disk, stamped C-231 1942, vertically set in west end of wall on south face of brick building from northeast corner of intersection of State Route 29 and Ryan Road.
RM 13	389.70	U.S.G.S. disk, stamped D-231 1942, in west end of north concrete headwall of box culvert approximately 525 feet southeast of intersection of State Route 29 and Brophy Lane.
RM 14	391.93	Square cut on southwest corner of concrete wing wall of southwest corner of County Route 61 steel bridge over Batten Kill in Battenville.
RM 15	410.58	Square cut on northwest corner of concrete headwall on west side of Skellie Road approximately 0.5 mile north of intersection with County Route 61.
RM 16	400.09	Square cut on northwest corner of concrete headwall on west side of State Route 29, approximately 150 feet north of mile marker No. 29 1804 1102.
RM 17	402.63	Square cut on southeast corner of concrete headwall of concrete bridge on west side of State Route 29, approximately 75 feet north of intersection with State Route 29.
RM 18	396.94	Square cut on northeast corner of concrete headwall on east side of Skellie Road, approximately 0.75 mile southwest of intersection with Cassidy Road.
RM 19	425.32	U.S.G.S. disk, stamped G-231 1942, approximately 2 feet up on southeast corner of brick farmhouse on northeast corner of intersection of State Route 29 and Christie Road.
RM 20	411.88	Square cut on southwest corner of concrete headwall on southwest corner of intersection of State Route 29 and Irwin Road in East Greenwich.

[1]National Geodetic Vertical Datum of 1929.

Legend

——— - Proposed Water Transmission Main

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

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- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE A99** To be protected from 100-year flood by Federal flood protection system under construction; no base flood elevations determined.
- **ZONE V** Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- **ZONE VE** Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

- **ZONE X** Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside 500-year floodplain.
- **ZONE D** Areas in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS

Floodplain Boundary

Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones

513 Base Flood Elevation Line; Elevation in Feet*

D—D Cross Section Line

(EL 987) Base Flood Elevation in Feet Where Uniform Within Zone*

RM 7x Elevation Reference Mark

•M1.5 River Mile

*Referenced to the National Geodetic Vertical Datum of 1929

NOTES

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Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

For additional flood panels see separately printed map index.

MAP REPOSITORY

Town Hall, 2 Academy Street, Greenwich, New York 12834 Maps available for reference only, not for distribution.

INITIAL IDENTIFICATION:

JULY 31, 1986

FLOOD HAZARD BOUNDARY MAP REVISIONS:

NONE

FLOOD INSURANCE RATE MAP EFFECTIVE:

JULY 3, 1986

FLOOD INSURANCE RATE MAP REVISIONS:

March 16, 1992 - to add base flood elevations, to change special flood hazard areas, to change zone designations, to delete map format, to add roads and road names, and to reflect updated topographic information.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE

1000 0 1000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

TOWN OF
GREENWICH, NEW YORK
WASHINGTON COUNTY

PANEL 10 OF 15
(SEE MAP INDEX FOR PANELS NOT PRINTED)

PANEL LOCATION

COMMUNITY-PANEL NUMBER
361233 0010 C

MAP REVISED:
MARCH 16, 1992

Federal Emergency Management Agency

Figure 2-5
Agricultural Districts

Legend

- Municipal Boundaries
- Washington County Agricultural District 4
- Proposed Water Transmission Main

End of proposed water transmission main

STATE ROUTE 40

GALESVILLE DR

UNNAMED STREET

FIDDLERS ELBOW RD

MOOREHOUSE LN

COUNTY RTE 53

STATE ROUTE 29

MEADER RD

Town of Greenwich

Town of Easton

LARK ST

PINEVIEW DR

SHERMAN AVE

LINCOLN AVE

End of proposed water transmission main

Proposed connection to Village of Greenwich water system

Sources: Basemap- NYSGPO, 2017; Municipal Boundaries- NYSGPO, 2020; Water Main- B&L, 2021; Agricultural Districts- Cugir, 2019;

Barton & Loguidice

N W E S

0 250 500 1,000 Feet

Town of Greenwich

Agricultural Districts

Washington County May 2021 New York

Figure 2-5

Project No. 1587.003

Figure 4-1
Alternative 1

Potential Tank Site 2
Parcel #: 228-3-8
Owner: Joseph D. Facin
Elevation: ~370'

Potential Tank Site 1
Parcel #: 228-3-9.9
Owner: Martins Food of S. Burlington
Elevation: ~370'

Potential Booster Pump Station in Right-of-way

Connection to Existing 8" Village Watermain

STATE ROUTE 40

STATE ROUTE 29

MAIN

MOWRY

ABEEL

LINCOLN

WILSON

JACKSON

LARK

CARL

LYTTLE

FOREST

ACADEMY

FIDDLERS ELBOW

MOOREHOUSE

PS

Legend

- Greenwich_Contours_10ft
- Proposed Watermain
- Village 8" Watermain
- Potential Tank Parcels

Sources:----------

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Barton & Loguidice

1 inch = 800 feet

Town of Greenwich

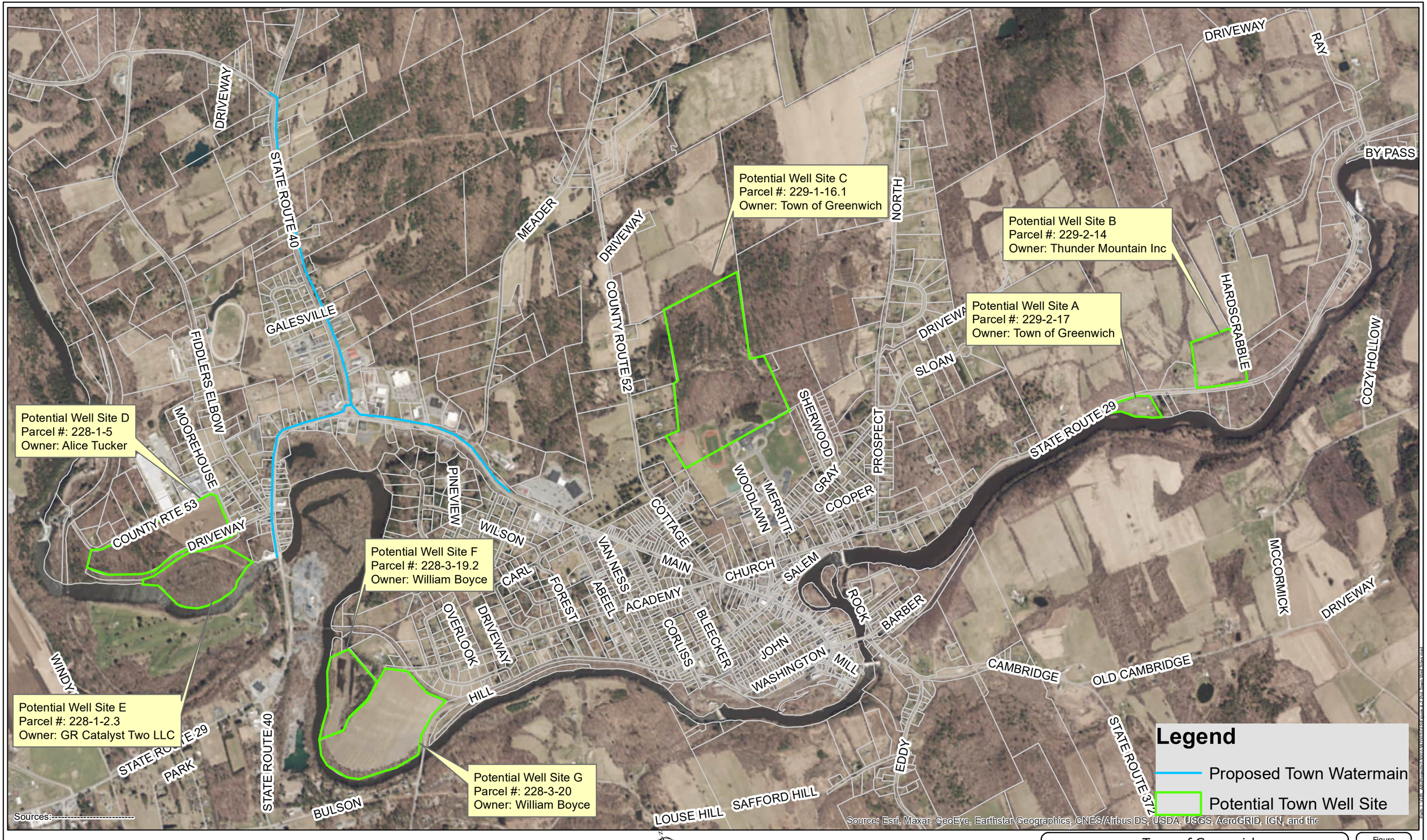
Alternative 1

Washington County May 2021 New York

Figure 4-1

Project No. 1587.003

Figure 4-2
Potential Town Well Sites



Barton & Loguidice

1 inch = 1,800 feet

Town of Greenwich

Potential Town Well Sites

Washington County May 2021 New York

Figure 4-2

Project No. 1587.003

Figure 4-3
Alternative 2

COUNTY ROUTE 77

DRIVEWAY

STATE ROUTE 40

GALESVILLE

FIDDLERS ELBOW

MOOREHOUSE

STEVEN

MEADER

STATE ROUTE 29

DRIVEWAY

PINEVIEW

SHERMAN

LINCOLN

JACKSON

WILSON

LARK

CARL

COUNTY RTE 53

DRIVEWAY

UNNAMED STREET

Potential Tank Site 2
Parcel #: 228-3-8
Owner: Joseph D. Facin
Elevation: ~370'

Potential Tank Site 1
Parcel #: 228-3-9.9
Owner: Martins Food of S. Burlington
Elevation: ~370'

Potential Well Site D
Parcel #: 228-1-5
Owner: Alice Tucker

Potential Well Site E
Parcel #: 228-1-2.3
Owner: GR Catalyst Two LLC

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Sources:----------

Legend

- Proposed Watermain
- Village 8" Watermain
- Potential Town Well Site
- Potential Tank Parcels

Barton & Loguidice

1 inch = 900 feet

Town of Greenwich

Alternative 2

Washington County May 2021 New York

Figure 4-3

Project No. 1587.003

Figure 4-4
Alternative 3

COUNTY ROUTE 77

DRIVEWAY

STATE ROUTE 40

GALESVILLE

Potential Tank Site 2
Parcel #: 228-3-8
Owner: Joseph D. Facin
Elevation: ~370'

Potential Tank Site 1
Parcel #: 228-3-9.9
Owner: Martins Food of S. Burlington
Elevation: ~370'

MEADER

FIDDLERS ELBOW

MOOREHOUSE

STATE ROUTE 29

Potential Booster Pump Station
in Right-of-way

DRIVEWAY

Potential Well Site D
Parcel #: 228-1-5
Owner: Alice Tucker

PS

PINEVIEW

SHERMAN

LINCOLN

COUNTY RTE 53

DRIVEWAY

Emergency connection to
Existing 8" Village Watermain

CARL

UNNAMED STREET

Potential Well Site E
Parcel #: 228-1-2.3
Owner: GR Catalyst Two LLC

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Sources:

Legend

- Proposed Watermain
- Village 8" Watermain
- Potential Town Well Site
- Potential Tank Parcels

Barton & Loguidice

1 inch = 900 feet

Town of Greenwich

Alternative 3

Washington County May 2021 New York

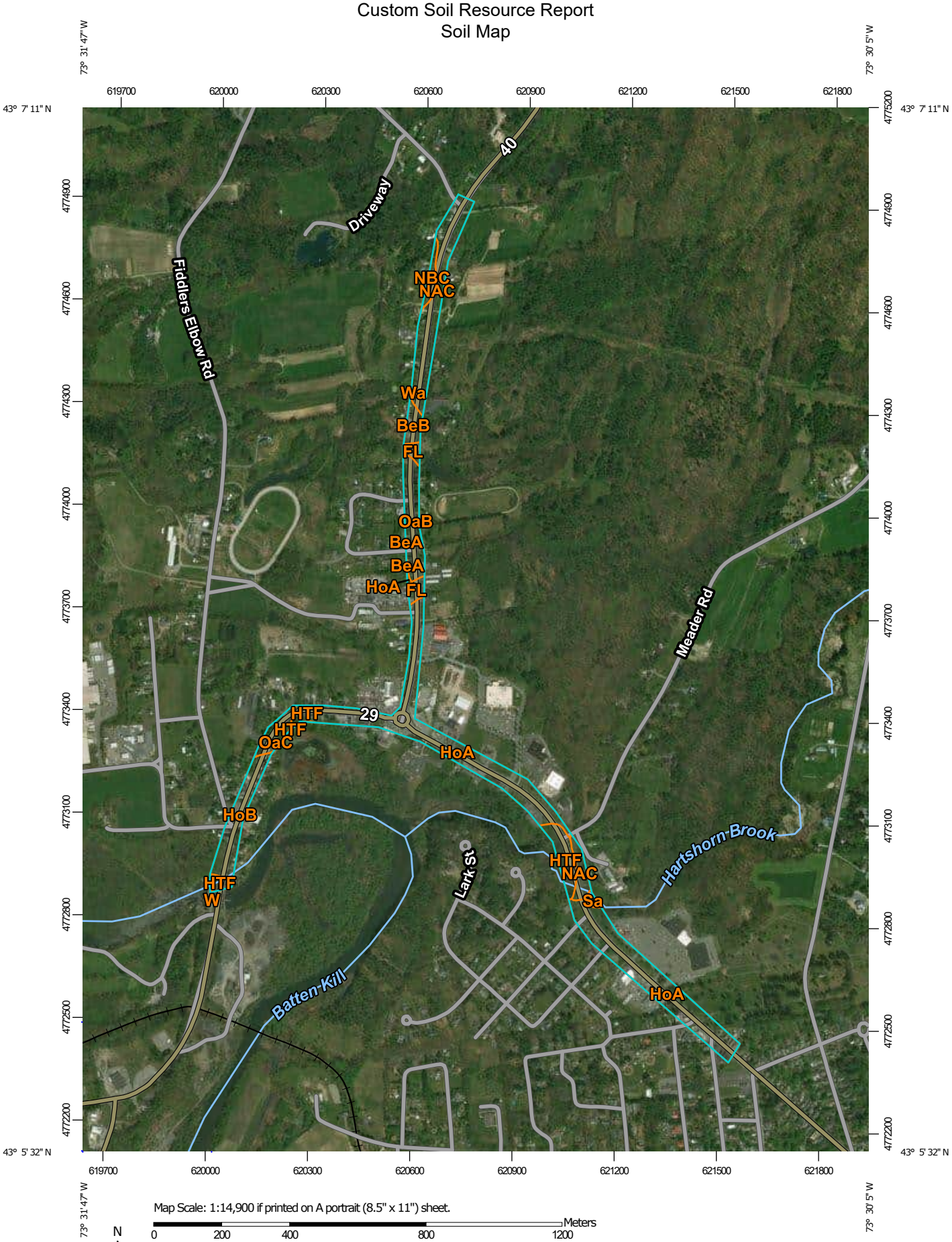
Figure 4-4

Project No. 1587.003

Appendices

Appendix A
USGS Soil Resource Report

Custom Soil Resource Report
Soil Map



Map Scale: 1:14,900 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 200 400 800 1200

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Washington County, New York
Survey Area Data: Version 20, Jun 11, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 10, 2015—Mar 29, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BeA	Belgrade silt loam, 0 to 2 percent slopes	0.0	0.1%
BeB	Belgrade silt loam, 2 to 6 percent slopes	1.2	2.2%
FL	Fluvaquents	1.3	2.4%
HoA	Hoosic gravelly sandy loam, 0 to 3 percent slopes	26.3	50.3%
HoB	Hoosic gravelly sandy loam, 3 to 8 percent slopes	4.5	8.7%
HTF	Hoosic and Otisville soils, steep and very steep	3.1	6.0%
NAC	Nassau shaly silt loam, undulating through hilly	8.8	16.9%
NBC	Nassau-Rock outcrop association, undulating through hilly	0.9	1.7%
OaB	Oakville loamy fine sand, 0 to 5 percent slopes	4.1	7.8%
OaC	Oakville loamy fine sand, 5 to 15 percent slopes	1.7	3.2%
Sa	Saco silt loam	0.3	0.5%
W	Water	0.0	0.0%
Wa	Wallington silt loam, sandy substratum	0.1	0.2%
Totals for Area of Interest		**52.3**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion

of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Washington County, New York

BeA—Belgrade silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 9xym
Elevation: 80 to 590 feet
Mean annual precipitation: 35 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 110 to 175 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Belgrade and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Belgrade

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Glaciolacustrine or eolian deposits comprised mainly of silt and very fine sand

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 24 inches: silt loam
H3 - 24 to 65 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 1.98 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water capacity: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: F144AY018NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Rhinebeck

Percent of map unit: 5 percent

Hydric soil rating: No

Oakville

Percent of map unit: 5 percent
Hydric soil rating: No

Wallington

Percent of map unit: 5 percent
Hydric soil rating: No

Hartland

Percent of map unit: 5 percent
Hydric soil rating: No

Hudson

Percent of map unit: 5 percent
Hydric soil rating: No

BeB—Belgrade silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 9xyn
Elevation: 80 to 620 feet
Mean annual precipitation: 35 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 110 to 175 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Belgrade and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Belgrade

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Glaciolacustrine or eolian deposits comprised mainly of silt and very fine sand

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 24 inches: silt loam
H3 - 24 to 65 inches: silt loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 1.98 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water capacity: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B/D
Ecological site: F144AY018NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Hartland

Percent of map unit: 5 percent
Hydric soil rating: No

Wallington

Percent of map unit: 5 percent
Hydric soil rating: No

Rhinebeck

Percent of map unit: 5 percent
Hydric soil rating: No

Hudson

Percent of map unit: 5 percent
Hydric soil rating: No

Oakville

Percent of map unit: 5 percent
Hydric soil rating: No

FL—Fluvaquents

Map Unit Setting

National map unit symbol: 9xz4
Elevation: 300 to 1,800 feet
Mean annual precipitation: 35 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 110 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition

Fluvaquents and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fluvaquents

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Alluvium with highly variable texture

Typical profile

H1 - 0 to 11 inches: mucky silt loam
H2 - 11 to 72 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: FrequentNone
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 15 percent
Available water capacity: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Hydric soil rating: Yes

Minor Components

Teel

Percent of map unit: 6 percent
Hydric soil rating: No

Limerick

Percent of map unit: 6 percent
Landform: Flood plains
Hydric soil rating: Yes

Hamlin

Percent of map unit: 5 percent
Hydric soil rating: No

Saco

Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: Yes

Palms

Percent of map unit: 3 percent
Landform: Marshes, swamps
Hydric soil rating: Yes

HoA—Hoosic gravelly sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9xzn
Elevation: 100 to 1,100 feet
Mean annual precipitation: 35 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 110 to 175 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hoosic and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoosic

Setting

Landform: Deltas, outwash plains, terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: gravelly sandy loam
H2 - 8 to 35 inches: very gravelly loamy sand
H3 - 35 to 80 inches: very gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Otisville
Percent of map unit: 5 percent
Hydric soil rating: No

Oakville
Percent of map unit: 5 percent
Hydric soil rating: No

Fredon
Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Herkimer
Percent of map unit: 5 percent
Hydric soil rating: No

Halsey
Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

HoB—Hoosic gravelly sandy loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 9xzp
Elevation: 100 to 1,100 feet
Mean annual precipitation: 35 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 110 to 175 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Hoosic and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoosic

Setting
Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy and gravelly glaciofluvial deposits

Typical profile
H1 - 0 to 8 inches: gravelly sandy loam

H2 - 8 to 35 inches: very gravelly loamy sand
H3 - 35 to 80 inches: very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Otisville

Percent of map unit: 5 percent
Hydric soil rating: No

Unnamed soils

Percent of map unit: 5 percent

Fredon

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Herkimer

Percent of map unit: 5 percent
Hydric soil rating: No

Oakville

Percent of map unit: 5 percent
Hydric soil rating: No

HTF—Hoosic and Otisville soils, steep and very steep

Map Unit Setting

National map unit symbol: 9xzb
Elevation: 100 to 1,100 feet
Mean annual precipitation: 35 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 110 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition

Hoosic and similar soils: 50 percent
Otisville and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoosic

Setting

Landform: Deltas, outwash plains, terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: gravelly sandy loam
H2 - 8 to 35 inches: very gravelly loamy sand
H3 - 35 to 80 inches: very gravelly sand

Properties and qualities

Slope: 25 to 50 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Description of Otisville

Setting

Landform: Deltas, outwash plains, terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: gravelly sandy loam
H2 - 9 to 23 inches: very gravelly loamy sand
H3 - 23 to 60 inches: extremely gravelly loamy coarse sand

Properties and qualities

Slope: 25 to 50 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Oakville

Percent of map unit: 5 percent
Hydric soil rating: No

Eroded soils

Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed soils

Percent of map unit: 2 percent

NAC—Nassau shaly silt loam, undulating through hilly

Map Unit Setting

National map unit symbol: 9xzz
Elevation: 600 to 1,800 feet
Mean annual precipitation: 35 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 110 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition

Nassau and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nassau

Setting

Landform: Benches, ridges, till plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex

Across-slope shape: Convex
Parent material: Channery loamy till derived mainly from local slate or shale

Typical profile

H1 - 0 to 9 inches: channery silt loam
H2 - 9 to 19 inches: very channery loam
H3 - 19 to 23 inches: unweathered bedrock

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Minor Components

Bernardston

Percent of map unit: 7 percent
Hydric soil rating: No

Hudson

Percent of map unit: 6 percent
Hydric soil rating: No

Unnamed soils

Percent of map unit: 5 percent

Rhinebeck

Percent of map unit: 5 percent
Hydric soil rating: No

Palms

Percent of map unit: 2 percent
Landform: Marshes, swamps
Hydric soil rating: Yes

NBC—Nassau-Rock outcrop association, undulating through hilly

Map Unit Setting

National map unit symbol: 9y00
Elevation: 600 to 1,800 feet

Mean annual precipitation: 35 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 110 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition

Nassau and similar soils: 40 percent
Rock outcrop: 20 percent
Minor components: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nassau

Setting

Landform: Benches, ridges, till plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Channery loamy till derived mainly from local slate or shale

Typical profile

H1 - 0 to 9 inches: channery silt loam
H2 - 9 to 19 inches: very channery loam
H3 - 19 to 23 inches: unweathered bedrock

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Minor Components

Unnamed soils

Percent of map unit: 10 percent

Bernardston

Percent of map unit: 9 percent
Hydric soil rating: No

Scriba

Percent of map unit: 9 percent
Hydric soil rating: No

Sun

Percent of map unit: 8 percent
Landform: Depressions
Hydric soil rating: Yes

Palms

Percent of map unit: 4 percent
Landform: Swamps, marshes
Hydric soil rating: Yes

OaB—Oakville loamy fine sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 9y05
Elevation: 600 to 1,200 feet
Mean annual precipitation: 35 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 110 to 175 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Oakville and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oakville

Setting

Landform: Deltas, outwash plains, terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy eolian, beach ridge, or glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: loamy fine sand
H2 - 9 to 24 inches: loamy fine sand
H3 - 24 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Cosad

Percent of map unit: 5 percent
Hydric soil rating: No

Otisville

Percent of map unit: 5 percent
Hydric soil rating: No

Claverack

Percent of map unit: 5 percent
Hydric soil rating: No

Unnamed soils

Percent of map unit: 5 percent

OaC—Oakville loamy fine sand, 5 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9y06
Elevation: 600 to 1,200 feet
Mean annual precipitation: 35 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 110 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition

Oakville and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oakville

Setting

Landform: Deltas, outwash plains, terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex

Parent material: Sandy eolian, beach ridge, or glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: loamy fine sand
H2 - 9 to 24 inches: loamy fine sand
H3 - 24 to 60 inches: fine sand

Properties and qualities

Slope: 5 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Hoosic

Percent of map unit: 7 percent
Hydric soil rating: No

Otisville

Percent of map unit: 7 percent
Hydric soil rating: No

Claverack

Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed soils

Percent of map unit: 3 percent

Sa—Saco silt loam

Map Unit Setting

National map unit symbol: 9y0r
Elevation: 80 to 950 feet
Mean annual precipitation: 35 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 110 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition

Saco and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Saco

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Silty alluvium derived mainly from crystalline rock, shale, and sandstone

Typical profile

H1 - 0 to 12 inches: silt loam
H2 - 12 to 30 inches: silt loam
H3 - 30 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: FrequentNone
Frequency of ponding: None
Available water capacity: Very high (about 13.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Minor Components

Limerick

Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: Yes

Teel

Percent of map unit: 5 percent
Hydric soil rating: No

Wallington

Percent of map unit: 4 percent
Hydric soil rating: No

Belgrade

Percent of map unit: 4 percent
Hydric soil rating: No

Fluvaquents
Percent of map unit: 2 percent
Landform: Flood plains
Hydric soil rating: Yes

W—Water

Map Unit Setting
National map unit symbol: 1qdsb
Mean annual precipitation: 35 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 110 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition
Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Wa—Wallington silt loam, sandy substratum

Map Unit Setting
National map unit symbol: 9y10
Elevation: 80 to 850 feet
Mean annual precipitation: 35 to 42 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 110 to 175 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Wallington, sandy substratum, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wallington, Sandy Substratum

Setting
Landform: Lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Glaciolacustrine or eolian deposits high in silt and very fine sand

Typical profile
H1 - 0 to 9 inches: silt loam
H2 - 9 to 17 inches: silt loam
H3 - 17 to 48 inches: silt loam

H4 - 48 to 80 inches: stratified loamy fine sand to very gravelly coarse sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 15 to 24 inches to fragipan
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: F144AY018NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Belgrade

Percent of map unit: 5 percent
Hydric soil rating: No

Hartland

Percent of map unit: 5 percent
Hydric soil rating: No

Rhinebeck

Percent of map unit: 5 percent
Hydric soil rating: No

Madalin

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

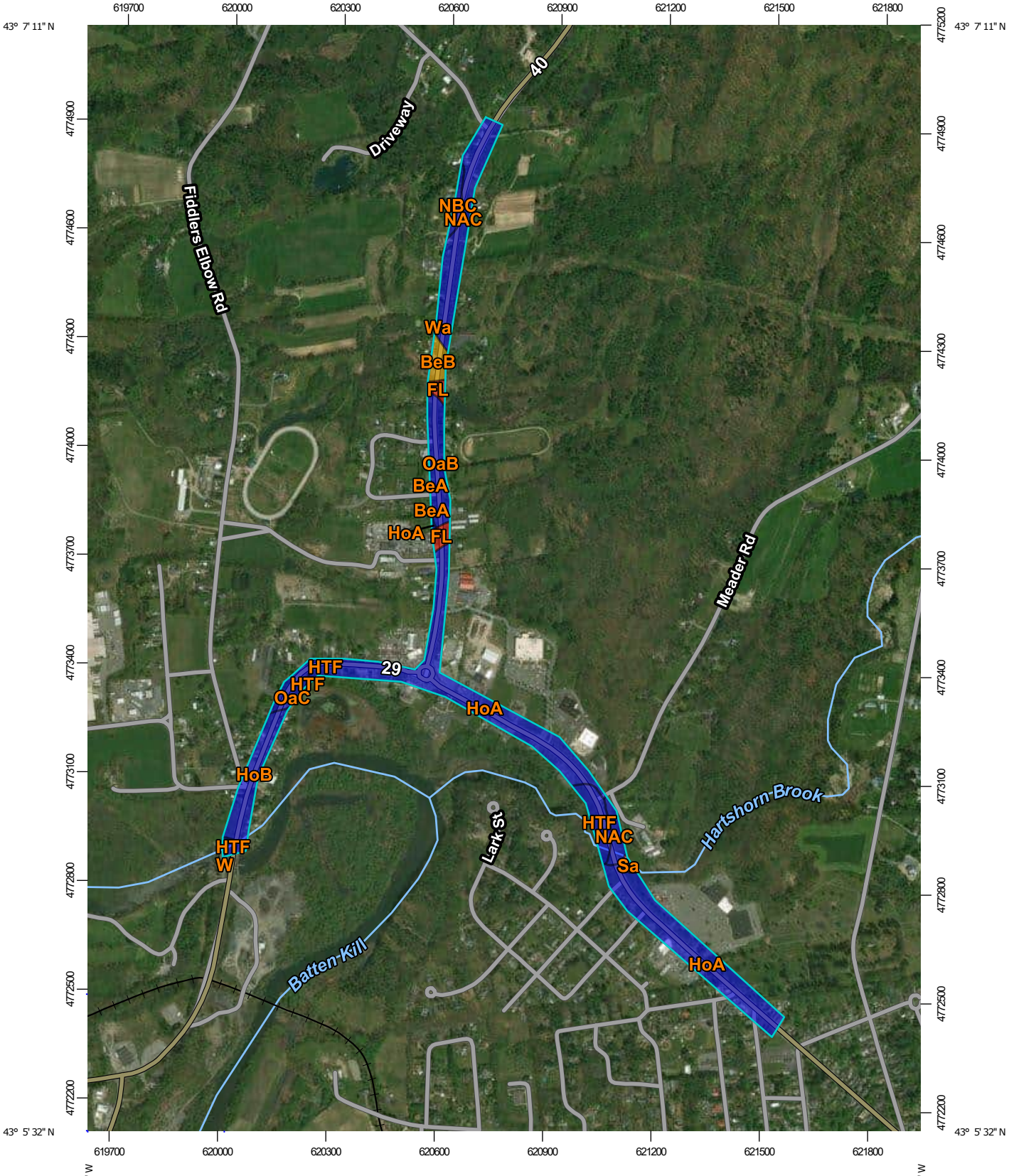
Water Features

Water Features include ponding frequency, flooding frequency, and depth to water table.

Depth to Water Table

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.


73° 31' 47" W
73° 30' 5" W
43° 7' 11" N
43° 5' 32" N
619700
620000
620300
620600
620900
621200
621500
621800
4775200
4774900
4774600
4774300
4774000
4773700
4773400
4773100
4772800
4772500
4772200
40
Driveway
Fiddlers Elbow Rd
NBC
NAC
Wa
BeB
FL
OaB
BeA
BeA
HoA
FL
Meader Rd
HTF
29
HTF
OaC
HoA
HoB
HTF
W
Lark St
HTF
NAC
Sa
Hartshorn Brook
HoA
Batten Kill
Map Scale: 1:14,900 if printed on A portrait (8.5" x 11") sheet.
N
Meters
0
200
400
800
1200
Feet
0
500
1000
2000
3000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Lines

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Points

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Washington County, New York
Survey Area Data: Version 20, Jun 11, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 10, 2015—Mar 29, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Depth to Water Table

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
BeA	Belgrade silt loam, 0 to 2 percent slopes	46	0.0	0.1%
BeB	Belgrade silt loam, 2 to 6 percent slopes	46	1.2	2.2%
FL	Fluvaquents	0	1.3	2.4%
HoA	Hoosic gravelly sandy loam, 0 to 3 percent slopes	>200	26.3	50.3%
HoB	Hoosic gravelly sandy loam, 3 to 8 percent slopes	>200	4.5	8.7%
HTF	Hoosic and Otisville soils, steep and very steep	>200	3.1	6.0%
NAC	Nassau shaly silt loam, undulating through hilly	>200	8.8	16.9%
NBC	Nassau-Rock outcrop association, undulating through hilly	>200	0.9	1.7%
OaB	Oakville loamy fine sand, 0 to 5 percent slopes	>200	4.1	7.8%
OaC	Oakville loamy fine sand, 5 to 15 percent slopes	>200	1.7	3.2%
Sa	Saco silt loam	8	0.3	0.5%
W	Water	>200	0.0	0.0%
Wa	Wallington silt loam, sandy substratum	31	0.1	0.2%
Totals for Area of Interest			**52.3**	**100.0%**

Rating Options—Depth to Water Table

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December

Appendix B
EDU Assessment

Base Alternative EDU Assessment								
Tax ID	Property Address	Owner	Owner Address	Owner City	Owner State	Zip Code	Property Class	EDUs
228.-3-9.9	1165 STATE ROUTE 29	Martins Foods Of S Burlington	PO Box 1000 - MS 6000	Portland	ME	4104	Supermarket	15
220.-2-16.1	2719 STATE ROUTE 40	Fearon, Lucas	2719 State Route 40	Greenwich	NY	12834	1 Family Res	1
220.-2-16.3	2718 STATE ROUTE 40	Grimes, Frieda A	2718 State Route 40	Greenwich	NY	12834	1 Family Res	1
220.-2-18	2690 STATE ROUTE 40	LaBounty, Sandie	2690 State Route 40	Greenwich	NY	12834	1 Family Res	1
220.-2-19	2668 STATE ROUTE 40	Talmadge, Raymond P	40 Church St	Schuylerville	NY	12871	Rural vac<10	0.5
220.-2-19.1	2680 STATE ROUTE 40	Denaker, George F	88 Eddy St	Greenwich	NY	12834	1 use sm bld	0.5
228.-3-16.1	1184 STATE ROUTE 29	Greenwich Realty Holding LLC	1621 Columbia Tpke	Castleton	NY	12033	1 use sm bld	6
228.-3-16	1166 STATE ROUTE 29	Camelot Corners LLC	3229 Poplar Pl	Wantagh	NY	11793	3 Family Res	3
228.-3-16.2	1156 STATE ROUTE 29	Kozo Properties LLC	1156 State Route 29	Greenwich	NY	12834-6135	Nbh shop ctr	5
220.-2-20.1	2665 STATE ROUTE 40	Talmadge, Brian	5A Tanager Way	South Glens Falls	NY	12803	Vac w/imprv	0
220.-2-20.2	STATE ROUTE 40	Ebbert, Karen T	1083 State Route 29	Greenwich	NY	12834	Res vac land	0.5
220.-2-20.3	2700 STATE ROUTE 40	Talmadge, Eric D	2700 State Route 40	Greenwich	NY	12834	1 Family Res	1
220.-2-21.2	STATE ROUTE 40	Polchowski, George	2624 State Route 40	Greenwich	NY	12834	Vac w/imprv	0
220.-2-23	2651&2653 STATE ROUTE 40	LKH Realty LLC	286 Church St	Saratoga Springs	NY	12866	Prof. bldg.	16
220.-2-24	2683 STATE ROUTE 40	Talmadge, Brian R	5A Tanager Way	South Glens Falls	NY	12803	Vac w/imprv	0
220.-2-24.1	2679 STATE ROUTE 40	Pulsifer, George W	2679 State Route 40	Greenwich	NY	12834	1 Family Res	1
220.-2-25.1	2699 STATE ROUTE 40	Powell, Richard A	2693 State Route 40	Greenwich	NY	12834	1 Family Res	1
220.-2-25.2	2693 STATE ROUTE 40	Powell, Richard A	2693 State Route 40	Greenwich	NY	12834	1 Family Res	1
220.-2-26	2703 STATE ROUTE 40	Polchowski, George	2618 State Route 40	Greenwich	NY	12834	2 Family Res	2
228.-2-17	2543 STATE ROUTE 40	Ashlar Charities Ltd	56 General Fellows Rd	Greenwich	NY	12834	Social org.	2
228.-2-18	2533 STATE ROUTE 40	Carmody, John A	35 Summit Lake Rd	Argyle	NY	12809	1 Family Res	1
228.-2-19	2531 STATE ROUTE 40	Carmody, John A	35 Summit Lake Rd	Argyle	NY	12809	Office bldg.	1
228.-2-2.3	2561 STATE ROUTE 40	Maltio LLC	1111 State Route 29	Greenwich	NY	12834	Vacant comm	0
228.-2-2.5	2551 STATE ROUTE 40	Stevelad Properties LLC	2551 State Route 40	Greenwich	NY	12834	Auto dealer	2
228.-2-2.7	2545 STATE ROUTE 40	Maltio LLC	1111 State Route 29	Greenwich	NY	12834	Office bldg.	7
228.-2-20.1	1111 STATE ROUTE 29	JC Carmody Holdings LLC	1111 State Route 29	Greenwich	NY	12834	Auto dealer	2
228.-2-5	2641 STATE ROUTE 40	Hughes, Harold	78 Oil Mill Hill Rd	Troy	NY	12182	Mfg housing	1
228.-2-6	2631 STATE ROUTE 40	Loftin, Timothy W	2631 State Route 40	Greenwich	NY	12834	1 Family Res	1
228.-2-7	2615 STATE ROUTE 40	Polchowski, George	2618 State Route 40	Greenwich	NY	12834	1 Family Res	1
228.-2-7.1	2609 STATE ROUTE 40	MacNeil, Catherine D	2583 State Route 40	Greenwich	NY	12834-2301	Vac w/imprv	0
228.-3-1	2596 STATE ROUTE 40	Smith, Christopher M	2596 State Route 40	Greenwich	NY	12834	1 Family Res	1
228.-3-10.1	2530 STATE ROUTE 40	Maltio LLC	1111 State Route 29	Greenwich	NY	12834	Mfg & office	5
228.-3-10.2	1123 STATE ROUTE 29	Suburban NY Property Acq LLC	240 Route 10 West	Whippany	NJ	7981	Fuel Store&Dist	1
228.-3-14.3	1134 STATE ROUTE 29	Glens Falls Hospital	100 Park St	Glens Falls	NY	12801	Hospital	10
228.-3-15	1148 STATE ROUTE 29	Li, Chun Shun	1148 State Route 29	Greenwich	NY	12834	1 Family Res	1
228.-3-14.1	1116 STATE ROUTE 29	Wever Car Wash Inc	100 South Hudson St	Mechanicville	NY	12118	Gas station	5
228.-3-14	1120 STATE ROUTE 29	Harren's Green Acres LLC	740 NYS Route 9P	Saratoga Springs	NY	12866	Bar	4
228.-3-14.2	1112 STATE ROUTE 29	Clark McGrouty, Donna D	PO Box 223	Greenwich	NY	12834	Mfg housing	1
228.-3-2	2586 STATE ROUTE 40	Facin, Joseph D	2586 State Route 40	Greenwich	NY	12834	Rurl res&rec	1.5
228.-3-24	1224 STATE ROUTE 29	Vision Venture Group LLC	1224 State Route 29	Greenwich	NY	12834	1 use sm bld	2
228.-3-3	2578 STATE ROUTE 40	Faile, David	2578 State Route 40	Greenwich	NY	12834	1 Family Res	1
228.-3-4	2572 STATE ROUTE 40	Pratt, Michele	2572 State Route 40	Greenwich	NY	12834	1 Family Res	1
228.-3-5	2570 STATE ROUTE 40	Byrnes, Sheila P	904 County Route 77	Greenwich	NY	12834	Mfg housing	0.75
228.-3-6	2566 STATE ROUTE 40	Flintlock Corp	1702 Central Ave	Albany	NY	12205	1 use sm bld	1
228.-3-7	2552 STATE ROUTE 40	K-Hill Property Management LLC	PO Box 53	Middle Falls	NY	12848	Converted Res	8
228.-3-8	2536 STATE ROUTE 40	Facin, Joseph D	2586 State Route 40	Greenwich	NY	12834	1 Family Res	1
228.-3-8.1	2560 STATE ROUTE 40	K-Hill Property Management LLC	PO Box 53	Middle Falls	NY	12848	Other Storage	0.5
228.-3-9.1	1193 STATE ROUTE 29	Greenwood Properties LLC	1529 Western Ave	Albany	NY	12203	Large retail	3
228.-3-9.10	1169 STATE ROUTE 29	Greenwich Partners LP	596 New Louden Rd	Latham	NY	12110	Reg shop ctr	2
228.-3-9.12	1175 STATE ROUTE 29	Greenwich Partners LP	596 New Loudon Rd	Latham	NY	12110	Large retail	3
228.-3-9.14	1133 STATE ROUTE 29	Burke, Thomas J	509 State Route 67	Malta	NY	12020	Restaurant	5
228.-3-9.15	1153 STATE ROUTE 29	Glens Falls National Bank	250 Glen St	Glens Falls	NY	12801	Prof. bldg.	1
228.12-4-19	2575 STATE ROUTE 40	Braymer, Ross A	2575 State Route 40	Greenwich	NY	12834	1 Family Res	1
228.12-4-20	STATE ROUTE 40	Braymer, David	346 Vly Summit Rd	Cambridge	NY	12816	Res vac land	0.5
228.12-4-21	2563 STATE ROUTE 40	Austin, Elton	2563 State Route 40	Greenwich	NY	12834	1 Family Res	1
228.12-4-6	2601 STATE ROUTE 40	Wold, Kristin L	2601 State Route 40	Greenwich	NY	12834	1 Family Res	1
228.12-4-7	2597 STATE ROUTE 40	Garrett, David D	2597 State Route 40	Greenwich	NY	12834	1 Family Res	1
228.12-4-8	2585 STATE ROUTE 40	Willette, Paul	2585 State Route 40	Greenwich	NY	12834	1 Family Res	1
228.12-4-9	2583 STATE ROUTE 40	MacNeil, Catherine D	2583 State Route 40	Greenwich	NY	12834-2301	1 Family Res	1
228.20-2-6	1 SHERMAN AVE	Eastman, Michelle L	17 John St	Greenwich	NY	12834	1 Family Res	1
228.20-2-7	1232 STATE ROUTE 29	VanSchaick Develop Corp	1232 State Route 29	Greenwich	NY	12834	1 use sm bld	1
228.20-2-8	1236 STATE ROUTE 29	Krantz, Gary H	1236 State Route 29	Greenwich	NY	12834-3203	1 Family Res	1
228.20-2-9	1240 STATE ROUTE 29	Batchelder, Steven	111 Meader Rd	Greenwich	NY	12834	Res w/Comuse	1
228.-2-7.2	2621 STATE ROUTE 40	Loftin, Timothy W	2631 State Route 40	Greenwich	NY	12834	2 Family Res	2
228.-2-7.3	STATE ROUTE 40	Loftin, Timothy W	2631 State Route 40	Greenwich	NY	12834	Rural vac<10	0
228.-2-20.4	STATE ROUTE 40	WR Enterprises LLC	PO Box 53	Middle Falls	NY	12848	Vacant comm	0.5
228.-2-20.5	STATE ROUTE 40	Carmody, John A	1111 State Route 29	Greenwich	NY	12834	Vacant comm	0.5
220.-2-21	2624 STATE ROUTE 40	Polchowski, George	2624 State Route 40	Greenwich	NY	12834	Res w/Comuse	7
220.-2-21.1	2618 STATE ROUTE 40	Polchowski, George	2624 State Route 40	Greenwich	NY	12834	1 Family Res	1
228.-3-9.16	1161 STATE ROUTE 29	Autozone Parts Inc	123 South Front St	Memphis	TN	38103	Large retail	12
229.-1-27.4	4-8 MEADER RD	NECB Properties LLC	8 Meader Rd	Greenwich	NY	12834	Other Storage	1
N/A	Galesville Rd Homes						Housing development (23- 1 Family Res)	23
228.11-1-16	1071 STATE ROUTE 29	Johnson, Eric	1071 State Route 29	Greenwich	NY	12834	1 Family Res	1
228.11-1-17	1075 STATE ROUTE 29	Perkins, Peter M	1077 State Route 29	Middle Falls	NY	12848	Multiple res	1.5
228.11-1-18	1079 STATE ROUTE 29	WR Enterprises LLC	PO Box 53	Middle Falls	NY	12848	Govt bldgs	1
228.11-1-19	1083 STATE ROUTE 29	WR Enterprises LLC	PO Box 53	Middle Falls	NY	12848	1 Family Res	1
228.11-1-20	1089 STATE ROUTE 29	Conkey, John F	1087 State Route 29	Greenwich	NY	12834	1 Family Res	1
228.11-1-21	1091 STATE ROUTE 29	WR Enterprises LLC	PO Box 53	Middle Falls	NY	12848	1 Family Res	1
228.11-1-22	1097 STATE ROUTE 29	Thomsen, Gerald R	1091 State Route 29	Middle Falls	NY	12848	1 Family Res	1
228.-3-11	1094 STATE ROUTE 29	Viscusi, Darren	104 State Route 29	Greenwich	NY	12834	Res w/Comuse	1
228.-3-12.1	1106 STATE ROUTE 29	Battenkill Motors LLC	1106 State Route 29	Greenwich	NY	12834	Auto dealer	2
228.-3-12.2	1100 STATE ROUTE 29	Ball, James	73 Nealy Ln	Salem	NY	12865	Office bldg.	1
228.-3-13	STATE ROUTE 29	Peckham Materials Corp	172 Prospect Hill Rd	Brewster	NY	10509	Vacant comm	0.5
228.15-3-3	1051 STATE ROUTE 29	Swift, Michael	697 Hampton Rd	Pomfret Center	CT	6259	Multiple res	4
228.15-3-3.1	STATE ROUTE 29	WR Enterprises LLC	PO Box 53	Middle Falls	NY	12848	Vacant comm	0.5
228.15-3-5	1045 STATE ROUTE 29	Smilansky, Robert	329 Priest Rd	Salem	NY	12865	1 Family Res	1
228.15-3-6	1043 STATE ROUTE 29	Shissler, Michael B	1041 State Route 29	Greeenwich	NY	12834	2 Family Res	2
228.15-3-7	1041 STATE ROUTE 29						1 Family Res	1
228.15-3-8	STATE ROUTE 29	Middle Falls Fire Dept Inc	1034 State Route 29	Greenwich	NY	12834	Vacant comm	0.5

228.15-3-9	STATE ROUTE 29	Middle Falls Fire Dept Inc	1034 State Route 29	Greenwich	NY	12834	Com vac w/imp	0.5
228.15-4-1	STATE ROUTE 29	Niedhammer, Melissa	1060 State Route 29	Greenwich	NY	12834	Rural vac<10	0
228.15-4-11	1024 STATE ROUTE 29	Trotter, Kenneth J	1024 State Route 29	Middle Falls	NY	12848	2 Family Res	2
228.15-4-12	1022 STATE ROUTE 29	Carpenter, Leslie	1022 State Route 29	Greenwich	NY	12834	1 Family Res	1
228.15-4-13	1018 STATE ROUTE 29	Bassett, Benjamin W	24 Lewis Hill Ln	Greenwich	NY	12834	1 Family Res	1
228.15-4-15	1014 STATE ROUTE 29	Tomlinson, Paul	48 Marcy Ave	Brooklyn	NY	11211	1 Family Res	1
228.15-4-16	1010 STATE ROUTE 29	Toto, Mauro S	17 Rock St	Greenwich	NY	12834	2 Family Res	2
228.15-4-17	1008 STATE ROUTE 29	Banfield, Timothy N	1008 State Route 29	Greenwich	NY	12834	1 Family Res	1
228.15-4-18	STATE ROUTE 29	National Grid	300 Erie Blvd E	Syracuse	NY	13202	Elec-hydro	0
228.15-4-18.1	STATE ROUTE 29	Middle Falls Limited Partner	39 Hudson Falls Rd	South Glens Falls	NY	12803	Res vac land	0.5
228.15-4-2	1060 STATE ROUTE 29						1 Family Res	1
228.15-4-20	1023 STATE ROUTE 29	Becker, Suzanne P	20 Bleeker St	Greenwich	NY	12834	1 Family Res	1
228.15-4-21	1027 STATE ROUTE 29						1 Family Res	1
228.15-4-4	1054 STATE ROUTE 29	Vertichio, Joseph	1054 State Route 29	Middle Falls	NY	12848	1 Family Res	1
228.15-4-5	1050 STATE ROUTE 29	1050 State Route 29 LLC	194 Summit Lake Rd	Argyle	NY	12809	2 Family Res	2
228.15-4-6	1048 STATE ROUTE 29	1048 State Route 29 LLC	194 Summit Lake Rd	Argyle	NY	12809	2 Family Res	2
228.15-4-7	1044 STATE ROUTE 29	Searles, E Wayne	1044 State Route 29	Greenwich	NY	12834	2 Family Res	2
228.15-4-8	1042 STATE ROUTE 29	Hoffman, Kathryn	PO Box 37	Middle Falls	NY	12848	1 Family Res	1
228.15-4-9	1034 STATE ROUTE 29	Middle Falls Fire Dept Inc	1034 State Route 29	Greenwich	NY	12834	Police/fire	4
Proposed Demands								
50 unit apt (1-2 beds)							Apts	12
30 Apartments, behind hannafords (1-2 beds)							Apts	8
Meader Road development (10-20 homes)							1 Family Res	15
Fiddler's Elbow Apartments (30-50 Apartments							Apts	12
Comfort Inn (hotel, 150 beds)							hotel	30
Small Office building (20 employees)							office bldg	1
							Total EDUs	312.75 EDUs

Appendix C
IPac Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
Phone: (607) 753-9334 Fax: (607) 753-9699
http://www.fws.gov/northeast/nyfo/es/section7.htm

In Reply Refer To: May 21, 2021
Consultation Code: 05E1NY00-2021-SLI-2730
Event Code: 05E1NY00-2021-E-08574
Project Name: Greenwich Water System Improvements Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). This list can also be used to determine whether listed species may be present for projects without federal agency involvement. New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list.

Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list. If listed, proposed, or candidate species were identified as potentially occurring in the project area, coordination with our office is encouraged. Information on the steps involved with assessing potential impacts from projects can be found at: http://www.fws.gov/northeast/nyfo/es/section7.htm

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the Services wind

energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the ESA. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
(607) 753-9334

Project Summary

Consultation Code: 05E1NY00-2021-SLI-2730
Event Code: 05E1NY00-2021-E-08574
Project Name: Greenwich Water System Improvements Project
Project Type: WATER SUPPLY / DELIVERY
Project Description: The Town of Greenwich does not currently have public water available to its businesses and residents. Public interest in municipal water has been raised and the Town is eager to grow its commercial district. It is difficult to attract business owners when there is no municipal water available. This leaves potential business owners wary of bringing their business to the Town for fear of dealing with the risks of water contamination and poor yields that can occur with wells. This limits the Town's growth. It has also been noted that some current business owners do not drink their well water because of existing aesthetics and fear of contamination. New water system improvements are proposed.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@43.10742045,-73.51775887052989,14z

Counties: Washington County, New York

Endangered Species Act Species

There is a total of 0 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Critical habitats

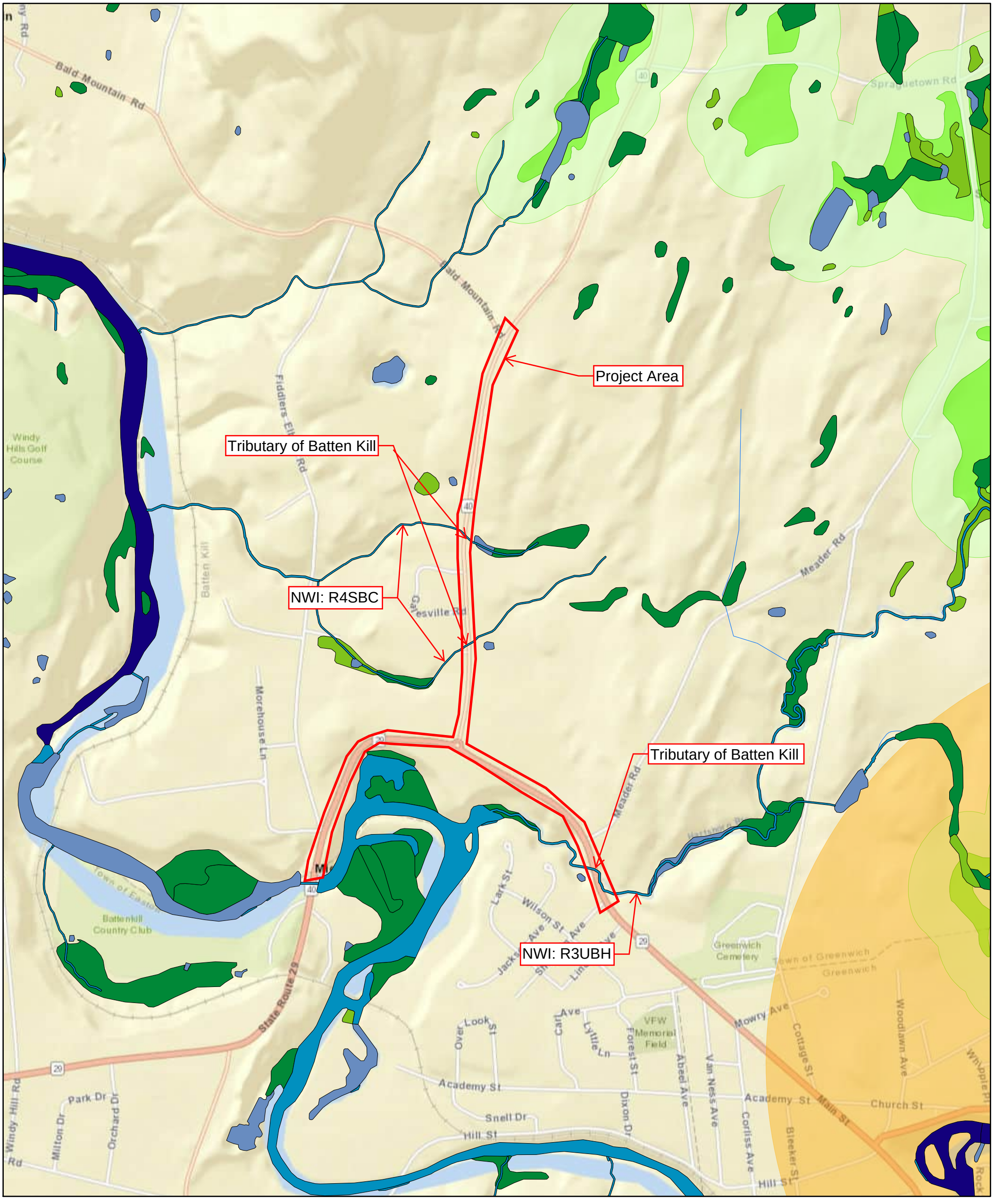
THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Appendix D
Environmental Resources Mapper

Town of Greenwich Water Transmission Main

NYSDEC and NWI Mapped Resources and Rare Plants or Animals and Significant Natural Communities

Environmental Resource Mapper



NWI Wetland Key

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

NYSDEC Resource Key

- NYSDEC Wetland
- NYSDEC Stream

Legend

- Rare Plants or Animals
- Significant Natural Communities

1:18,056

0 0.15 0.3 0.6 mi

0 0.23 0.45 0.9 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

NYS Department of Environmental Conservation

Not a legal document

Appendix E
Tank Sizing Calculations

Barton & Loguidice

JOB Town of Greenwich Water System Imrprovements

SHEET NO. 1 OF 1

CALCULATED BY CEP DATE 5/20/2021

CHECKED BY RAR DATE 6/25/21

DESCRIPTION Tank Sizing

Tank Capacity Calculation

New Tank Service Area Demands:

Existing EDUs = 235 EDUs[1] Proposed EDUs = 78 EDUs[1] Total EDUs = 313 EDUs[1]

165 gpd/EDU basis:

Current ADD = 38,800

Projected ADD[2] = 51,600

Projected PDD[3] = 103,200

Sizing Criteria 1

Tank volume > 1.5 * PDD

Projected PDD x 1.5 = **154,800 gallons**

Sizing Criteria 2

Tank Volume > ADD plus fire flow

Fire Flow = 4 HRS @ 500 GPM = 120,000 gallons

ADD = 51,600 gallons (Based on 165 gpd/EDU)

ADD plus FF = **171,600 gallons**

Sizing

Use 175,000 gallon tank capacity > Projected PDD & ADD plus FF

[1]From Appendix B

[2]ADD 165 GPD per EDU

[3]PDD = ADD x 2

Appendix F
Pump Sizing Calculations

Barton & Loguidice

10 Airline Drive, Suite 200, Albany, NY 12205
Phone 518-218-1801 · Fax 518-218-1805

JOB	Town of Greenwich Water System Improvements		
SHEET NO.	1	OF	1
CALCULATED BY	CEP	DATE	6/28/2021
CHECKED BY	RAR	DATE	7/14/2021
DESC.	Pump Demand Calculations		

Town Tank Demands

New Service Area Demands:

Existing EDUs = 235 EDUs[1] Proposed EDUs = 78 EDUs[1] Total EDUs = 313 EDUs[1]

Existing:

Average Daily Demand (ADD)[2] = 39,000 GPD

Peak Daily Demand (PDD)[3] = 78,000 GPD

Peak Hour Demand (PHD)[4] = 108 GPM

Projected[5]:

Average Daily Demand (ADD)[2] = 13,000 GPD

Peak Daily Demand (PDD)[3] = 26,000 GPD

Peak Hour Demand (PHD)[4] = 36 GPM

New Service Area Highest Projected Demand = 104,000 GPD = **73 GPM**

Total Demands for Pump Station:

New Service Area = 73 GPM

Total = 73 GPM Pump sized for 125 GPM

[1]From Appendix B

[2]ADD 165 GPD per EDU

[3]PDD = ADD x 2

[4]PHD = ADD x 4 / 1440

[5]Based on Village expected growth per Village meeting

Appendix G
Cost Estimations

Barton & Loguidice

10 Airline Drive, Suite 200, Albany, NY 12205
Phone 518-218-1801 · Fax 518-218-1805

JOB	(T) Greenwich -Water System Improvements Project		
SHEET NO.	1	OF	1
CALCULATED BY	CEP	DATE	5/24/2021
CHECKED BY	RAR	DATE	7/14/2021
DESC.	Alternative 1 Project Cost Estimate		

Item	Description	Estimated	Units	Unit Cost	Total
1	Mobilization/Demobilization (shall not excees 4%)	1	LS	$50,000	$50,000
2	Clearing	1	LS	$50,000	$50,000
3	Work Zone Traffic Control	1	LS	$20,000	$20,000
4	Furnish and Install 8" Water Main	15800	LF	$150	$2,370,000
5	Furnish and Install 8" Valves	27	EA	$2,000	$54,000
6	Furnish and Install 8" Hydrants	20	EA	$5,000	$100,000
7	Furnish and Install 3/4-Inch Type K Copper Tubing	4560	LF	$15	$68,400
8	Furnish and Install Water Services to Right of Way	114	EA	$2,000	$228,000
9	Furnish and Install Connection to Village Water Main	1	EA	$7,500	$7,500
10	Restoration	15800	LF	$5	$79,000
11	Tank Land Acquisition	1	LS	$100,900	$100,900
12	Aquastore Model 3133 Tank and associated piping	1	LS	$652,000	$652,000
13	Booster Pump Station	1	EA	$300,000	$300,000
Construction Subtotal:					$4,080,000
Contingency (30%):					$1,224,000
Inflation (2% per year to 2023):					$220,000
Subtotal:					$5,524,000
Estimated Engineering, Legal, Adminstration (25%):					$1,381,000
Total (2023 dollars):					$6,910,000

Barton & Loguidice

10 Airline Drive, Suite 200, Albany, NY 12205
Phone 518-218-1801 · Fax 518-218-1805

JOB	(T) Greenwich -Water System Improvements Project		
SHEET NO.	1	OF	1
CALCULATED BY	CEP	DATE	5/24/2021
CHECKED BY	RAR	DATE	7/14/2021
DESC.	Alternative 2 Project Cost Estimate		

Item	Description	Estimated	Units	Unit Cost	Total
1	Mobilization/Demobilization (shall not excees 4%)	1	LS	$50,000	$50,000
2	Clearing	1	LS	$50,000	$50,000
3	Work Zone Traffic Control	1	LS	$20,000	$20,000
4	Furnish and Install 8" Water Main	15800	LF	$150	$2,370,000
5	Furnish and Install 8" Valves	27	EA	$2,000	$54,000
6	Furnish and Install 8" Hydrants	20	EA	$5,000	$100,000
7	Furnish and Install 3/4-Inch Type K Copper Tubing	4560	LF	$15	$68,400
8	Furnish and Install Water Services to Right of Way	114	EA	$2,000	$228,000
9	Restoration	15800	LF	$5	$79,000
10	Well Site Land Acquisition	1	LS	$47,600	$47,600
10	New Town Wells	1	LS	$ 758,500	$758,500
11	Treatment Building	1	LS	$385,000	$385,000
12	Tank Land Acquisition	1	LS	$100,900	$100,900
13	Aquastore Model 3133 Tank and associated piping	1	LS	$ 652,000	$652,000
	Construction Subtotal:				$4,964,000
	Contingency (30%):				$1,489,000
	Inflation (2% per year to 2023):				$261,000
	Subtotal:				$6,720,000
	Estimated Engineering, Legal, Adminstration (25%):				$1,680,000
	Total (2023 dollars):				$8,400,000

Barton & Loguidice

10 Airline Drive, Suite 200, Albany, NY 12205
Phone 518-218-1801 · Fax 518-218-1805

JOB	(T) Greenwich -Water System Improvements Project		
SHEET NO.	1	OF	1
CALCULATED BY	CEP	DATE	5/24/2021
CHECKED BY	RAR	DATE	7/14/2021
DESC.	Alternative 3 Project Cost Estimate		

Item	Description	Estimated	Units	Unit Cost	Total
1	Mobilization/Demobilization (shall not exceed 4%)	1	LS	$50,000	$50,000
2	Clearing	1	LS	$50,000	$50,000
3	Work Zone Traffic Control	1	LS	$20,000	$20,000
4	Furnish and Install 8" Water Main	15800	LF	$150	$2,370,000
5	Furnish and Install 8" Valves	27	EA	$2,000	$54,000
6	Furnish and Install 8" Hydrants	20	EA	$5,000	$100,000
7	Furnish and Install 3/4-Inch Type K Copper Tubing	4560	LF	$15	$68,400
8	Furnish and Install Water Services to Right of Way	114	EA	$2,000	$228,000
9	Restoration	15800	LF	$5	$79,000
10	Furnish and Install Connection to Village Water Main	1	EA	$7,500	$7,500
11	Well Site Land Acquisition	1	LS	$47,600	$47,600
12	New Town Wells	1	LS	$ 758,500	$758,500
11	Treatment Building	1	LS	$385,000	$385,000
13	Tank Land Acquisition	1	LS	$100,900	$100,900
14	Aquastore Model 3133 Tank & Site Work	1	LS	$ 652,000	$652,000
15	Booster Pump Station	1	LS	$300,000	$300,000
Construction Subtotal:					$5,271,000
Contingency (30%):					$1,581,000
Inflation (2% per year to 2023):					$277,000
Subtotal:					$7,130,000
Estimated Engineering, Legal, Administration (25%):					$1,790,000
Total (2023 dollars):					$8,920,000

Appendix H
DWSRF Scoring Criteria

Factor from DWSRF Project Scoring Sheet	Max. Score	Possible Score	Applicable Item(s) from Project Scope
A. MCL/Treatment Technique Violations			
1. Microbiological	-		
a. Surafce Water Treatment Rule (i. Filtration, ii. Filtration Performance Cirteria (NTU complicance), iii. CT Disinfection	**180**		
b. E. coli	**80**		
c. Total Coliform	**40**		
2. Organics - Organic chemicals (POC/UOC) and disinfection by-product	**40**		
3. Lead and Copper/Corrosion (mandated)	**30**		
4. Radiological	**25**		
5. Inorganic/Physical	-		
a. Nitrates	**50**		
b. Other health-related	**25**		
c. Aesthetic	**10**	**10**	1, 2, 3
B. Non-treatment Sanitary Code Violations (more than one item may apply):			
1. Inadequate Source Capacity (public health hazard)	**50**		
2. Inadequate Distribution Pressure (public hazard hazards)	**25**		
3. Uncovered Finished Water Storage (public health hazards)	**25**		
C. System Reliability/Dependability Issues (more than one item may apply):			
1. Complete replacement or major rehabilitation of existing treatment facility for primary contaminants that has exceeded design life and/or does not meet the design standards in the current edition of Recommended Standards For Water Works.	**20**		
2. Upgrade, replace and/or install major vulnerable system components to meet the design standards in the current edition Recommended Standard For Water Works. Any of the following apply.	**10**	**10**	4, 5, 6
a. A principal component intergral to an existing filtration process such as sedimentation, flocculation, filtration, chemical feed, or backwashing (can only receive points for Criteria C.2.a or C.1.)	-		
b. Pump Stations	-		
c. Existing wells	-		
d. Existing disinfection system for a groundwater/surface water supply	-		
e. Transmission main	-		
f. Finished water or distribution storage	-		
g. Other water treatment systems for secondary contaminants only (or replacement source instead of treatment)	-		
3. Aged mains and appurtenances	**5**		
4. Redundancy of critical components (pumps, valves, chemical feed-systems, etc.)	**5**		
5. Asbestos main replacement	**5**		
6. Control/automation for operational efficency (computerization, control valves, metering, laboratory upgrading)	**5**		
7. Inadequate source capacity which is not a public health hazard (can only receive points fot Criteria B1 or C7)	**5**		
D. Governmental Needs (more than one may apply)			
1. Development of a water system or extending existing system to service contaminated or insufficent yeilding private well at existing residential housing (new systems are not eligible for point under Criteria A, B, or C)	**40**	**40**	1, 2
2. Consolidation of water systems (can include improving technical, managerial, and financial capacity development)	**25**		
3. System dependent on a Sole Source Aquifer for its source. (These points can only be obtained if system source points from Criterion A, B, C.1. or C.2.g.)	**25**		
4. A project that has received written commitment of funding from another governmental source (e.g., co-funded with Clean Water SRF, Rural Development, HUD, etc.) These points do not apply to refinancing of projects.	**10**		
5. Consistent with Water Resources Management Strategy	**5**		
6. Proposed operational changes that improve and insure adequate technical, managerial and financial capacity of the system in order to insure compliance	**5**		
E. Financial Need	**25**	**5**	Based on being in >92.5 - ≤100 of State MHI
TOTAL ESTIMATED POSSIBLE SCORE	**770**	**65**	

Alternative Water Source

1.) Create new water district by connecting to existing Village Water Mains.
2.) Create new water district by drilling well in Town to provide water.
3.) Install new pipe lines and service connections to each property

Water Distribution and Transmission

4.) Install new water mains to meet Ten State Standards
5.) Install main line valves and hydrants to Ten State Standards

Water Storage

6.) Install new 178,000 gallon tank

Appendix I
Smart Growth Assessment

NEW YORK STATE OF OPPORTUNITY. | Department of Health | Environmental Facilities Corporation

Smart Growth Assessment Form

This form should be completed by an authorized representative of the applicant, preferably the project engineer or other design professional.[1]

Section 1 – General Applicant and Project Information

Applicant: Town of Greenwich Project No.: 1587.003.001

Project Name: Water District #1 Evaluation

Is project construction complete? ☐ Yes, date: ☑ No

Please provide a brief project summary in plain language including the location of the area the project serves:

The Town currently does not have public water and there is public interest to bring water to the community to grow it's business district. The proposed project includes a connection to the existing 8" Village water main, approximately 15,800 linear feet of DIP water main, 183,000 gallon (178,000 gallon capacity) water storage tank and associated valves and piping, and a 300 gpm booster pump station to fill water storage tank.

Section 2 – Screening Questions

A. Prior Approvals

1. Has the project been previously approved for Environmental Facilities Corporation (EFC) financial assistance? ☐ Yes ☑ No
2. If yes to A(1), what is the project number(s) for the prior approval(s)? Project No.:
3. If yes to A(1), is the scope of the previously-approved project substantially the same as the current project? ☐ Yes ☐ No

If your responses to A(1) and A(3) are both yes, please proceed to Section 5, Signature.

B. New or Expanded Infrastructure

1. Does the project involve the construction or reconstruction of new or expanded infrastructure? ☑ Yes ☐ No

Examples of new or expanded infrastructure include, but are not limited to:

(i) The addition of new wastewater collection/new water mains or a new wastewater treatment system/water treatment plant where none existed previously;

(ii) An increase of the State Pollutant Discharge Elimination System (SPDES) permitted flow capacity for an existing wastewater treatment system; and OR

[1] If project construction is complete and the project was not previously financed through EFC, an authorized municipal representative may complete and sign this assessment.

(iii) An increase of the permitted water withdrawal or the permitted flow capacity for the water treatment system such that a Department of Environmental Conservation (DEC) water withdrawal permit will need to be obtained or modified, or result in the Department of Health (DOH) approving an increase in the capacity of the water treatment plant.

If your response to B(1) is no, please proceed to Section 5, Signature.

Section 3 –Smart Growth Criteria

Your project must be consistent will all relevant Smart Growth criteria. For each question below please provide a response and explanation.

1. Does the project use, maintain, or improve existing infrastructure?
   ☐ Yes ☑ No

   Explain your response: The Town of Greenwich does not currently have municipal water. They would be creating a new water district.

2. Is the project located in a (1) municipal center, (2) area adjacent to a municipal center, or (3) area designated as a future municipal center, as such terms are defined herein (please select one response)?

   ☑ Yes, my project is located in a municipal center, which is an area of concentrated and mixed land uses that serves as a center for various activities, including but not limited to: central business districts, main streets, downtown areas, brownfield opportunity areas (see *www.dos.ny.gov* for more information), downtown areas of local waterfront revitalization program areas (see *www.dos.ny.gov* for more information), areas of transit-oriented development, environmental justice areas (see *www.dec.ny.gov/public/899.html* for more information), and hardship areas (projects that primarily serve census tracts or block numbering areas with a poverty rate of at least twenty percent according to the latest census data).

   ☐ Yes, my project is located in an area adjacent to a municipal center which has clearly defined borders, is designated for concentrated development in the future in a municipal or regional comprehensive plan, and exhibits strong land use, transportation, infrastructure, and economic connections to an existing municipal center.

   ☐ Yes, my project is located in an area designated as a future municipal center in a municipal or comprehensive plan and is appropriately zoned in a municipal zoning ordinance

   ☐ No, my project is not located in a (1) municipal center, (2) area adjacent to a municipal center, or (3) area designated as a future municipal center.

   Explain your response and reference any applicable plans:

3. Is the project located in a developed area or an area designated for concentrated infill development in a municipally-approved comprehensive land use plan, local waterfront revitalization plan, and/or brownfield opportunity area plan?

☑Yes ☐No

Explain your response and reference any applicable plans:

This project would bring municipal water to the commercial district of the Town of Greenwich.

4. Does the project protect, preserve, and enhance the State's resources, including surface and groundwater, agricultural land, forests, air quality, recreation and open space, scenic areas, and significant historic and archaeological resources?

☐Yes ☑No

Explain your response:

There are none of these resources within the project area to protect.

5. Does the project foster mixed land uses and compact development, downtown revitalization, brownfield redevelopment, the enhancement of beauty in public spaces, the diversity and affordability of housing in proximity to places of employment, recreation and commercial development, and the integration of all income and age groups?

☑Yes ☐No

Explain your response:

This project will allow the Town to grow their commercial district, therefore bringing in more places of employment.

6. Does the project provide mobility through transportation choices including improved public transportation and reduced automobile dependency?

☐Yes ☐No ☑N/A

Explain your response:

7. Does the project involve coordination between State and local government, intermunicipal planning, or regional planning?

☑Yes ☐No

Explain your response and reference any applicable plans:

The project proposes that the Town connect to the Village of Greenwich's water system and buy water from the Village. this would require intermunicipal planning. The project would also be located within the NYSDOT right of way and would require coordination with them.

8. Does the project involve community-based planning and collaboration?

   ☐Yes ☑No

   Explain your response and reference any applicable plans:

9. Does the project support predictability in building and land use codes?

   ☐Yes ☐No ☑N/A

   Explain your response:

10. Does the project promote sustainability by adopting measures such as green infrastructure techniques, decentralized infrastructure techniques, or energy efficiency measures?

    ☐Yes ☑No

    Explain your response and reference any applicable plans:

    This is not applicable to the project.

11. Does the project mitigate future physical climate risk due to sea-level rise, storm surges, and/or flooding, based on available data predicting the likelihood of future extreme weather events, including hazard risk analysis data, if applicable?

    ☐Yes ☑No

    Explain your response and reference any applicable plans:

    This is not applicable to the project.

Section 4 – Miscellaneous

1. Is the project expressly required by a court or administrative consent order? ☐ Yes ☑ No

   If yes, and you have not previously provided the applicable order to EFC/DOH, please submit it with this form.

Section 5 – Signature

By signing below, you agree that you are authorized to act on behalf of the applicant and that the information contained in this Smart Growth Assessment is true, correct and complete to the best of your knowledge and belief.

Applicant: Town of Greenwich	Phone Number: 518-692-7611
Name and Title of Signatory: Donald H. Fletcher, P.E.	
Signature: Donald H. Fletcher Digitally signed by Donald H. Fletcher DN: cn=Donald H. Fletcher, c=US, o=Barton & Loguidice, D.P.C., email=dfletcher@bartonandloguidice.com Date: 2021.07.14 16:49:47 -04'00'	Date: July 14, 2021

The experience to
listen
The power to
solve℠

Barton
&Loguidice

www.bartonandloguidice.com