Preliminary Engineering Report

FOR THE

Town of Ashford
Sanitary Sewer Feasibility Study

Town of Ashford
9377 Route 240
Ashford, New York 14171

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1 Project Definition

1.1 Introduction

The Town of Ashford is currently serviced by private wastewater systems, with only a small portion of the southeast corner of the Town connected to a public water system (hamlet of West Valley). The lack of public sewer in the densely populated areas of the Town is viewed as an economic development deterrent. In addition, the Town recognizes that the private systems likely contribute to the water quality impairments in the Allegany River Drainage Basin.

The Town of Ashford has received public interest and support in establishing a municipal sewer district. This study will develop alternatives for a public sewer collection system in select areas throughout the Town. This study will also review potential wastewater treatment options, including conveyance of flows to an existing wastewater treatment facility operated by a neighboring municipality and the construction of a new centralized wastewater treatment facility near the nuclear plant as well as two separate package plants for each proposed sewer district within the Town as identified in the Comprehensive Plan. A map of the Town of Ashford planning districts is shown in ***Figure 1***.

1.2 Location

The Town of Ashford is located in Cattaraugus County, north of the Town of Ellicottville, south of the Town of Springville, west of the Town of Yorkshire and Machias, and east of the Town of Otto. ***Figure 2*** at the end of this report shows the Town of Ashford boundary on a map with topography of the area. The focus of this study will be the more densely populated areas of the Town, including the Route 219 Corridor Planning District and hamlet of West Valley Planning District. ***Appendix A*** includes photographs of the project area.

1.3 Environmental Resources Present

The Town of Ashford is located within the Upper Allegany River sub-basin and more specifically the Great Valley Creek Watershed. This portion of Great Valley Creek is a Class C(T) waterbody and is currently not listed as impaired. However, reports indicate that aquatic life is slightly stressed and nutrient pollution is suspected, falling under the slightly impacted range. The Great Valley Creek Watershed report from the New York State Department of Environmental Conservation (NYSDEC) is included in ***Appendix B***.

According to the NYSDEC's Environmental Resources Mapper and the U.S. Fish and Wildlife Service National Wetlands Inventory, there are numerous creeks and streams throughout the proposed planning districts. The major water bodies in the area are the Allegany River to the south and Great Valley and Buttermilk Creek. There are no mapped State Freshwater Wetlands within either of the proposed planning districts. Nearby mapped wetlands are located to the southeast of the Route 219 Corridor Planning District, identified as State Freshwater Wetland AH-2 and south of the hamlet of West Valley, identified as State Freshwater Wetland WV-1. These maps have been included in ***Appendix C***. No rare plants or animals have been identified within the planning districts but exist to the north of proposed Sewer District No. 1.

There are farmlands present and two populated residential areas. Portions of the proposed project are located within an Agricultural District, the Ashford Meadows. A map of the Cattaraugus County Agricultural Districts has been included in ***Appendix C***. The majority of construction will be taking place in existing road right-of-ways and proper construction mitigation and restoration efforts will be implemented based on standard practices common to the industry. Environmental concerns that will need to be addressed include stream crossings and NYS and Federal wetlands.

1.4 Population Trends

The 2017 U.S. Census shows a population in the Town of Ashford as 2,061. Historical population data for the Town was obtained from the U.S. Census Bureau and the population projections are provided in the table below.

Town of Ashford Population Trends

Year	Town Population	Percent Change (+/-)	Status
1970	1,577	5.8%	Historical Population (Census)
1980	1,922	21.9%	Historical Population (Census)
1990	2,162	12.5%	Historical Population (Census)
2000	2,223	2.8%	Historical Population (Census)
2010	2,132	-4.1%	Historical Population (Census)
2011	2,123	-0.4%	Historical Population (Estimate)
2012	2,112	-0.5%	Historical Population (Estimate)
2013	2,104	-0.4%	Historical Population (Estimate)
2014	2,097	-0.3%	Historical Population (Estimate)
2015	2,079	-0.9%	Historical Population (Estimate)
2016	2,073	-0.3%	Historical Population (Estimate)
2017	2,061	-0.6%	Historical Population (Estimate)
2020	2,123	3.0%	Projection
2030	2,186	3.0%	Projection
2040	2,252	3.0%	Projection

Between 1970 and 1990 the Town population increased sharply, and then it saw steady growth through 2000. Since 2000, the population has remained relatively stable with a slight decline through 2017, decreasing by less than 1% to 4%. It is anticipated and a goal of the Town to continue growth at a steady rate, with 3% growth projections in each decade through 2040.

1.5 Community Engagement

The Town of Ashford is committed to developing a plan to implement sewer collection to protect the environmental resources in the region and provide the benefit of sewer collection to its residents. The Town is in the early stages of the process but intends to involve the community through public information meetings, public hearings, and the environmental review process, should the possibility of public sewer become more of a reality.

1.6 Previous Studies and Reports

No previous studies and reports were reviewed or available to determine pre-existing problems within the Town or to review any other pertinent information that is available. The Comprehensive Plan is the main document utilized to establish potential sewer service areas within the Town.

2 Flow and Organic Load

2.1 Organic Loadings

The proposed service area is mostly comprised of residential homes with a few commercial businesses. The waste is anticipated to be typical raw wastewater and organic loadings with a biochemical oxygen demand (BOD) concentration of 250 mg/L and total suspended solids (TSS) concentration of 250 mg/L.

2.2 Estimated Sanitary Sewer Flows

The average daily flow for a typical residential property is estimated to be 300 gallons per day or 109,500 gallons per year. This is considered one Equivalent Dwelling Unit (EDU). The average daily flows for non-residential properties are calculated based on the historic average annual water usage. The EDU for non-residential customers is calculated by dividing the average daily water usage by 300 gpd. The full unit definition and full break down of the unit count are included in ***Appendix D***. Some highlights include the following:

- Each single-family residential dwelling shall be considered one unit. Included in this category will be single-family houses, mobile homes, and manufactured homes.
- Multiple single-family dwellings on the same parcel of land will each be considered an individual unit.
- All parcels of vacant land which are developable will each be assessed 0.1 units.
- All vacant parcels that are classified as "not developable" shall be assessed 0.01 units.
- Non-residential, recreational, educational, commercial, industrial, and agricultural facilities will be assigned an equivalent number of units based on the greater of the two methods as follows:

    1. The average daily usage divided by 300 gpd
    (Average Daily Usage ÷ 300 = number of units).

    2. Expected average daily usage (based on type of facility) divided by 300 gpd. The type of facility and expected flow rates (gals/day) are based on the Design Standards for Wastewater Treatment Works – Intermediate Sized Sewerage Facilities (New York State Department of Environmental Conservation, 1988), Table 3 – Expected Hydraulic Loading Rates.

The proposed project includes several future service extension areas in Sewer District No. 1 as shown in ***Figure 8***. However, the focus of this report will be Sewer District No. 1 and Sewer District No. 2. The total calculated number of units for each sewer district is approximately 175.5 for SSD1 and 249.31 for SSD2. The peak hourly flows were estimated by applying a peaking factor of 4.0, based on the "Recommended Standards for Wastewater Facilities, 2014 Edition." The table below includes an evaluation of the projected sanitary flows as well as the number of EDUs per street within the project area.

SEWER DISTRICT #1 ESTIMATED FLOWS (RTE 219 CORRIDOR)

Street	EDUs	Flow Rate (gpd/unit)	Estimated Average Daily Design Flows (gpd)	Estimated Peak Hourly Flow (gpd)
Autumn View Ln	8	300	2,460	9,840
Edies Road	31	300	9,186	36,744
US Route 219	87	300	26,220	104,880
Peters Road	11	300	3,183	12,732
Miller Road	2	300	603	2,412
Rock Springs Road	9	300	2,733	10,932
Schwartz Road	8	300	2,433	9,732
Dutch Hill Road	5	300	1,530	6,120
Cross Road	12	300	3,720	14,880
TOTAL	**174**		**52,068**	**208,272**

Note: Water Usage and EDUs are estimated

SEWER DISTRICT #2 ESTIMATED FLOWS (HAMLET OF WEST VALLEY)

Street	EDUs	Flow Rate (gpd/unit)	Estimated Average Daily Design Flows (gpd)	Estimated Peak Hourly Flow (gpd)
County Road 32	146.31	300	43,893	175,572
Hill View Drive	9.5	300	2,850	11,400
Williams Avenue	13	300	3,900	15,600
Felton Hill Road	12.5	300	3,750	15,000
Pine Cliff Drive	16.5	300	4,950	19,800
Depot Street	28.5	300	8,550	34,200
School Street	7	300	2,100	8,400
White Street	4	300	1,200	4,800
Dole Avenue	6	300	1,800	7,200
Ashford Hollow Road	6	300	1,800	7,200
TOTAL	**249.31**		**74,793**	**299,172**

Note: Water Usage and EDUs are estimated

Estimates for four (4) other service areas in the Town have been included in the study, but they are anticipated to be future sewer district extensions as the ability to fund a project in excess of $5,000,000 is not feasible with a unit cost that the property owners can afford.

3 Impact on Existing Facilities

3.1 Location Map

Figure 3 shows the proposed project locations for Sewer District No. 1 and Sewer District No. 2. Figures 4-6 demonstrate possible treatment alternatives 1-3 for connection to the existing Springville Wastewater Treatment Facility (WWTF), package WWTF's for SSD1 and SSD2, and a centralized WWTF.

3.2 History

The Town of Ashford is entirely serviced by private wastewater systems. A list of septic systems that have been permitted in the Town since 1970 (County records begin in 1970) can be obtained from Cattaraugus County to determine system locations during the design phase. Presumably, many of these systems were constructed in the 1970's or before as part of the original home construction.

The Town is actively investigating the feasibility of installing a public sewer system with intent to proceed if found feasible. The preliminary planning districts are outlined in the Comprehensive Plan.

3.3 Condition of Existing Facilities

Many of the onsite wastewater disposal systems in the proposed service area are near the end of their usable design life or are inadequately sized. Typical onsite wastewater treatment systems include conventional, shallow trench, sand filters, and raised beds. All existing onsite private treatment systems will need to be decommissioned upon successful hook-up to the proposed new sanitary sewer system.

3.4 Financial Status of any Existing Facilities

The property owners in the area have private wastewater disposal systems and operate and maintain the systems themselves. Repairs of these systems can range between $2,000 and $5,000. When a system needs full replacement, a property owner can expect costs between $10,000 and $20,000 depending on soil conditions and the size of the property. Properties in the Town of Ashford and the hamlet of West Valley are smaller in size, making replacement difficult. The upfront capital costs combined with routine maintenance over the life of the system may discourage the landowner from moving forward with the development, whether residential, commercial or industrial, especially when there are several municipalities near the Town that offer public sanitary service at little, to no upfront capital cost to the landowner. The installation of a public sanitary sewer system will help alleviate the costs associated with maintaining these private systems as well as encouraging smart growth and development.

4 Project Description

4.1 Description

The goal of this project is to provide a safe and reliable public sanitary sewer disposal system to the residents of the Town of Ashford including portions of the hamlet of West Valley and Ashford Hollow. The collection system will consist of appropriately sized low-pressure sewer mains for Sewer District No. 1 and gravity sewer mains for Sewer District No. 2 to convey wastewater to a Wastewater Treatment Facility (WWTF). Several alternatives have been considered for treatment and are discussed in Section 8 of this report.

4.2 Need for Project: Health, Sanitation and Security

Discussions with the Town have indicated home inspections performed during recent home sales have revealed failing treatment systems within the service area. Typically, the existing treatment systems are older conventional systems which often do not meet the current Health Department standards. The expected useful life of a properly designed and maintained private treatment system is approximately 15 - 20 years.

Often these failing traditional systems are replaced with expensive non-conventional onsite treatment systems or raised bed systems. A Soils Map generated from the USDA website in ***Appendix E*** indicates the soils in the study area are rated as being "somewhat limited to very limited" for Septic Tank Absorption Field by the USDA Soil Survey.

In addition, while many of these systems appear to be in working order, most the properties within the area are small in size and have insufficient area for properly sized replacement septic systems. There have been numerous accounts of new septic systems failing to meet NYS Sanitary Code requirements due to poor soil conditions and lack of proper area.

In freshwater environments, phosphorus is usually the limiting nutrient, meaning if more phosphorus were added to these environments then more plants would be able to grow, and the other essential nutrients would be available in large supply. As a result, marine environments that have experienced abnormally rapid plant growth, such as algal blooms, are often linked to increased phosphorus discharges. By limiting phosphorus discharges, many of these plant growth explosions can be inhibited over time.

Like nitrogen, phosphorus is naturally occurring in human and animal wastes. Phosphorus can also be included in many types of detergents, but the state of New York has passed legislation banning the use of phosphorus in hand soaps and laundry detergents in the 1970s, and more recently passed legislation banning its use in dishwashing detergents.

Phosphorus is also present in many fertilizers to ensure that a lack of phosphorus in the soil is not the cause of poor plant production. Precipitation that falls over lands covered by these fertilizers picks up the excess phosphorus as it flows into creeks and rivers. Ultimately, nutrients discharged from the WWTF are transported to the Genesee River, which has experienced many documented problems with poor water quality due to excess phosphorus and suspended solids.

In an effort to improve the environmental quality of the Genesee River Watershed, all potential sources of phosphorus within the watershed are currently being evaluated in the upcoming TMDL. Consequently, the WWTF will likely be required to treat for total phosphorus in the future, as indicated in discussions with the NYSDEC.

The proposed formation of a municipal sewer district and infrastructure will provide safe and reliable sanitary service to the residents of the Town of Ashford and will eliminate the public health and safety risks associated with the individual treatment systems in the service area.

4.3 Need for Project: Aging Infrastructure

A sewer collection system will replace expensive individual wastewater treatment systems; this will reduce the operation and maintenance costs borne by the residents at this time. A new Wastewater Treatment Facility (WWTF) within the Town of Ashford or connection to an existing WWTF are possible alternatives. When connecting to another municipality's WWTF, an agreement with the owner of the WWTF would need to be developed. Typically, the owner of the WWTF would continue to provide operation and maintenance of the WWTF and the Town sewer department would provide operation and maintenance of the sewer collection system and pump stations and pay an annual fee for treatment of the wastewater.

4.4 Need for Project: Reasonable Growth

While economic development is viewed as a project benefit, balancing economic development and land protection is necessary, critical, and will be considered in developing the sanitary sewer district. One of the deterrents for economic development is the lack of a municipally owned sanitary sewer system in the Town of Ashford.

Specific areas within the Town have been identified as possible targets for economic development. With the Town of Ashford, vacant parcels along NYS Route 219 have been identified as possible areas for commercial economic development. Crossroads of Rte. 219 such as Connoisarauley Road, Hennrietta Road, Peters Road, and Ashford Hollow Road have also been identified as potential residential building lots and therefore have been considered as part of this analysis. Once a viable municipal sewer system is established, moderate growth is possible within the Town of Ashford, the hamlet of West Valley, and in other areas of the Town.

5 Drawing/Site Plan

A figure for each proposed collection system and treatment alternative discussed in Section 8 is included at the end of this report.

6 Site Information

6.1 Soils

There is a wide range of soil types throughout the project site with the major soil types being Chenango channery silt loam (26B), Rhinebeck silt loam (35B), Valois gravelly silt loam, and Schuyler silt loam. A full list of soil types and a soils map is included in ***Appendix E***. These soils range from moderately-well-drained to well-drained with the depth to water table ranging from approximately 6 inches to over 6 feet. The depth to bedrock for the project area is over 6 feet for all soil types within the construction area. Maps showing drainage classification, water table depth, and bedrock depth are included in ***Appendix E***. Additionally, soil borings were performed throughout the areas of Sewer District No. 2 for a separate public water supply project in 2015. The SJB soil report is also included in ***Appendix E.***

6.2 Floodplain

The Town of Ashford contains Zone A flood designations within a few areas of Sewer District No. 1 and Sewer District No. 2 per the Flood Hazard Maps available on the Federal Emergency Management Agency's (FEMA) website. Other portions of the Town contain flood zones as defined by FEMA. The area surrounding Connoisarauley Creek and Buttermilk Creek and select tributaries are classified as Zone A or areas of the 100-year flood zone. Flood maps for both areas are included in the Environmental Resource Review Appendix, ***Appendix C***. Any pumping facilities required will be located outside or above the 100-year flood zones.

6.3 Future US Rte. 219 Corridor Extension to I-86

Future plans to extend the 4 lane US Rte. 219 highway down to Interstate 86 were considered when planning out the sewer districts. Large tracts of land are currently owned by the NYSDOT and the SSD1 district boundaries follow the outer edges of the state-owned properties associated with the proposed US Rte. 219 extension. Further coordination with the NYSDOT will be required to finalize the sewer district boundaries.

7 Alternatives Considered

7.1 Collection System

This analysis is separated into two components: collection system and treatment system. The collection system analysis includes 2 potential service areas. The service areas identified include a combination of gravity mains, force mains, and pump stations. The Town identified Sewer District No. 1 and Sewer District No. 2 as priority areas for sewer service. Sewer District No. 1 will be the most challenging due to its widely ranging elevation differences and rural type low-residential density. These areas will be analyzed further in this report.

The collection system options for Sewer District No. 1 (SSD1) includes 3 alternative sewer system options. Sewer option 1 for SSD1 assumes a low-pressure sewer which includes individual grinder pump stations for each residential house with air/vaccum valves along the mains at high and low points based on USGS topographic mapping. Sewer option 2 for SSD1 assumes a low-pressure sewer which includes all areas covered under Sewer option 1 plus future extension areas. Sewer option 3 for SSD1 assumes 8-inch gravity sewer (as required by 10-States) with 4-foot diameter manholes every 300 to 400 feet. Based on field observations, Sewer option 3 will need to have deep sections of collection mains to flow by gravity.

The collection system options for Sewer District No. 2 (SSD2) includes two alternative sewer system options. Sewer option 1 for SSD2 assumes a low-pressure sewer which includes individual grinder pump stations for each residential house with air/vaccum valves along the mains at high and low points based on USGS topographic mapping. Sewer option 2 for SSD2 assumes 8-inch gravity sewer (as required by 10-States) with 4-foot diameter manholes every 300 to 400 feet. Based on the anticipated current and future flows, mains larger than 8-inch were not considered. Connections to the houses and businesses would include 4-inch gravity laterals.

The proposed service areas with SSD1 and SSD2 will require pump stations, regardless of the direction of flow (north to south or south to north). For estimating purposes, each pump station will include an 8-foot diameter wet well with suction lift skid mounted pumps. Each pump station would also include a back-up generator, VFD's (where applicable), and basic SCADA. Submersible pumps were not considered to avoid confined space issues. Formal sizing and site layout of the pump stations will need to be completed during the design phase.

Refer to ***Figure 7*** and the detailed cost estimates in ***Appendix F*** for additional information on the preliminary collection system layout.

7.1.1 Sewer District No. 1 (219 Corridor & Ashford Hollow)

Sewer District No. 1 includes the majority of the 219 corridor through the Town of Ashford and is a high priority area for establishing a municipal sewer system. The service area includes Route 219, Edies Road, Autumn View, Peters Road E, Peters Road W, Rock Springs Road, Cross Road, and Schwartz Road. Future expansion areas include Hennrietta Road, Connoisarauley Road, Ashford Hollow Road, and Peters Road E.

There are approximately 175 EDU's within the service area. The improvements required in this section include approximately 16,650 linear feet of 2-inch low-pressure sewer main and approximately 31,400 linear feet of 4-inch or 6-inch force main (collection system sizing will need to be completed during the design phase to determine exact amount of each). Treatment for this service area is discussed in the next section of this report.

A preliminary cost estimate for Sewer District No. 1 is included in ***Appendix F*** and the proposed system layout is depicted in ***Figure 7***.

7.1.2 Sewer District No. 2 (Hamlet of West Valley)

Sewer District No. 2 includes the densely populated areas along Route 240 in the hamlet of West Valley in the Town of Ashford including portions of County Road 32, Hillview Drive, Williams Avenue, Felton Hill Road, Pine Cliff Drive, Depot Street, School Street, White Street, Dole Avenue, and Ashford Hollow Road. The hamlet of West Valley is the other high priority area within the Town for establishing a municipal sewer system. The service area includes everything within the existing West Valley Water District Boundary.

There are approximately 250 EDU's within the Hamlet of West Valley. The proposed improvements within SSD1 include conventional gravity mains and force mains to service the Hamlet. The improvements require approximately 21,415 linear feet of 8-inch gravity main with 54 manholes and 4-inch sewer laterals to connect residential properties. The treatment for this service area is discussed in the next section of this report.

A preliminary cost estimate for Sewer District No. 2 is included in ***Appendix F*** and the improvements are depicted in ***Figure 7.***

7.2 Treatment Alternatives

The second component of this analysis is treatment. Treatment options include existing WWTF's in neighboring municipalities, a new package WWTF, and a new conventional WWTF. The treatment alternatives are in addition to the service area infrastructure outlined in the previous section of the report.

As noted in the Village of Ashford's Master Plan, growth and development in the 2 areas identified as opportunity corridors, the Route 219 corridor and the West Valley Hamlet, is hindered in part by the lack of access to public sanitary sewer infrastructure. As such, the feasibility to provide such service in those 2 areas will be discussed herein. For any of the alternatives described below, the establishment of 2 succinct sewer districts will occur: Sanitary Sewer District No. 1 (SSD1) along the Route 219 corridor and Sanitary Sewer District No. 2 (SSD2) near West Valley.

3 alternatives to treat the wastewater generated by the proposed addition of public sanitary sewer infrastructure in the 2 sewer districts will be explored as follows:

- Alternative No. 1 – With the installation of new sanitary sewers and pump stations, all sanitary flow collected in Sewer Districts No. 1 and 2 will be conveyed to the Springville Wastewater Treatment Plant for treatment and disposal (see ***Figure 1***).

- Alternative No. 2 – Each Sewer District will operate independently, consisting of sanitary sewers and pump stations to transport sanitary flow from the respective district to its own, dedicated wastewater treatment plant for treatment and disposal (see ***Figure 2*** and ***Figure 4***).
- Alternative No. 3 – Each Sewer District will operate an independent system of sanitary sewers and pumps stations. Sanitary flow from each district will then be conveyed to one centralized wastewater treatment facility for treatment and disposal (see ***Figure 4***).

For the purpose of this report and to ensure the treatment alternatives can be compared to one another, the treatment capacity required by the Town of Ashford (including flow from the Hamlet of West Valley) is 175,000 gallons per day. This assumes full build out of all the service areas identified in this report including the Village of Ashford. Design flow is based on the following:

Sewer District No. 1	53,000 gpd
Sewer District No. 2	75,000 gpd
Future Expansions	47,000 gpd
Total	**175,000 gpd**

To evaluate the 3 proposed alternatives, each of the alternatives were advanced to a preliminary concept level of design. A review of publicly available data such as Cattaraugus County parcel data, NYS 1m DEM data, and existing SPDES permits for neighboring municipalities aided in the refinement of these concept designs. Additionally, preliminary contact was established with the nearby Villages. The following sections describe the evaluation of each alternative.

7.2.1 Alternative No. 1A – Null Alternative

This alternative proposes to "do nothing". Although there is no upfront capital cost, this would mean continued risk to the Town of Ashford residents due to the health and sanitation concerns associated with the aging and eventual failure of existing septic and private treatment systems. Continued economic growth in the Town would also be negatively impacted.

7.2.2 Alternative No. 1B – Connect to the Village of Ellicottville Wastewater Treatment Plant

This proposed alternative includes the installation of approximately 61,500 linear feet of sanitary sewer force main and 1 pump station. The new force main would be installed within road right-of-ways along Route 219 and connect to the existing collection system north of the intersection of Route 219 and Route 240 in the Town of Ellicottville.

The Ellicottville WWTF currently has approximately 0.600 MGD of available capacity, however during wet weather flows the capacity is reduced to the WWTF's limit. In addition, upcoming development in the Town of Ellicottville will use up any available capacity at the WWTF. As a result, upgrades would be required to accommodate potential flows of 175,000 gallons per day.

The current sewer rate for the Ellicottville WWTF to treat waste outside of the Town limits is approximately $90 for the first 12,000 gallons and then $0.008/gallon. Annual cost to treat the Town of Ashford wastewater would be approximately $476,050 per year.

7.2.3 Alternative No. 1 – Connect to the Village of Springville Wastewater Treatment Plant

The Village of Springville Wastewater Treatment Plant (WWTP) is located off Mill Street in the south-central section of the Village. The plant has a State permitted capacity of 1,150,000 gallons per day with average daily flows ranging from 600,000 gallons per day during dry conditions to 1,400,000 gallons per day in wet conditions. The plant provides advanced secondary treatment before sewage is discharged to Spring Brook.

The treatment process includes primary settling tanks, a high rate trickling filter, secondary settling tanks (with phosphorus removal),s and UV disinfection. There is a total of approximately 200,000 feet of gravity sewers in the Village, plus 4 sanitary pump stations which lift sewage from low areas.

The Village continues to make a significant investment in their sanitary infrastructure, both in the collection system and at the treatment plant. Some of the prior and future work in the collection system includes smoke testing to identify defects and illicit connections, rehabilitation including grouting to address areas of known inflow/infiltration (I&I), sewer main lining, and full sewer main replacements. Some of the prior and future work at the Springville WWTP includes grit removal improvements, secondary treatment improvements, primary digester rehabilitation, and SCADA system improvements.

Overall, the Village has seen positive results from their proactive infrastructure investment. The Village's sanitary sewer flows have decreased over the past several years. Only during heavy rainfall do they see a spike in sanitary flow slightly over permitted limits.

Topography

In general, the proposed sewer districts in Ashford are at higher elevations than the Springville WWTP; however, Cattaraugus Creek creates a low divide between the municipalities. A predominantly gravity system could be developed to convey flows to the intersection of Mill Street / Edies Road and Cattaraugus Creek. A lift station would then be required to pump the water up to the Springville WWTP.

Municipal Cooperation

Connection to the Springville WWTP would require absolute cooperation of all stakeholders including the Village of Springville Board of Trustees, the Town of Ashford Town Board, the NYSDEC, and the Cattaraugus County DOH. As part of this feasibility analysis, initial contact with the Village of Springville was made. Both the Village's

Superintendent of Public Works and Administrator are open to starting the conversation about a possible collaboration with the Town of Ashford. However, prior to taking any next steps, 3 main questions would need to be discussed and mutually agreed upon by the two municipalities, as follows:

- How many gallons per day is the Village willing and able to accept?
  - Should there be a limitation on how much flow is acceptable to both the Village and the NYSDEC? The Town would investigate the potential to send just SSD1 flow to the Springville WWTP and handle SSD2 flow separately.
- Are there pre-existing / known limitations in the Village's collection system that would require capital upgrades? What about at the Springville WWTP?
  - For purposes of this feasibility analysis, it is assumed that the Town of Ashford would not only make the capital investment needed to construct their own collection and conveyance system, but that the ongoing operational and maintenance (O&M) costs of such would be the Town's responsibility as well.
- What is a likely user fee schedule assuming 1 Town of Ashford Master Meter would feed into the Village's collection system?

Should the Village of Springville and the Town of Ashford elect to explore this option further, a joint municipal agreement between the Village and the Town, centered around these 3 discussion points would be created and then approved/voted on by their respective governing boards.

It is important to note that there is money available through the Intermunicipal Water Infrastructure Grants Program administered by the NYS Environmental Facilities Corporation. A project to construct a sanitary conveyance system and interconnection to the Springville WWTP would be a likely candidate for this type of program. Covering everything from project planning, design, and construction services, it would be advisable to pursue this funding avenue immediately upon execution of an intermunicipal agreement between the Village and the Town.

The Springville WWTP operates at the edge of its permitted limits during heavy wet weather events. Further, it is currently undergoing multi-million-dollar upgrades at the WWTP to upgrade and replace equipment at the end of its useful life. For purposes of this feasibility analysis, it is assumed that significant upgrades would be required at the Springville WWTP to accommodate an additional 175,000 gpd anticipated from SSD1 and SSD2 and that the cost of such improvements would be the responsibility of the Town of Ashford. Refer to ***Appendix F*** for a detailed cost analysis of the treatment alternatives considered.

Refer to ***Figure 4*** at the end of this report for a depiction of Alternative No. 1.

7.2.4 Alternative No. 2 – Dedicated Treatment for Each Sewer District

7.2.4.1 Sanitary Sewer District No. 1:

SSD1 is located on the western side of the Town extending along portions of US 219, Miller Road to Schwartz Road, Schwartz Road to Edies Road, and Edies Road.

Topography

In general, the topography of SSD1 is such that the highest elevations are at the southern limit and the lowest elevations are along the northern boundary near Cattaraugus Creek, adjacent to Schwartz Road, with the intersection at Miller Road being the lowest elevation. Along US 219 there are variations in grade as the roadway traverses over multiple streams and drainageways. A particularly low point in the profile is at Connoisarauley Creek, near the northern end of the district.

Public Property

According to the Cattaraugus County Parcel Viewer, there are no Town or County owned parcels in the immediate vicinity of SSD1.

There are multiple large parcels of land owned by New York State in and around SSD1. The properties within the district are predominantly under the jurisdiction of New York State Department of Transportation (NYSDOT) as related to the construction of US 219. There are also several large parcels of land under the jurisdiction of the New York State Energy and Research Development Authority (NYSERDA) along Buttermilk Creek associated with the former West Valley Nuclear Services Plant and the current West Valley Demonstration Project. These parcels extend along Buttermilk Creek from the plant downstream to the confluence with Cattaraugus Creek. The majority of these parcels are undeveloped, forested land.

Recommended Location

Due to the topography of SSD1, it is recommended that a wastewater treatment facility be constructed near the northern limits of the district To maximize gravity flow. There is 1 parcel of State-owned land in this area bounded by Miller Road, Schwartz Road, US 219, and Cattaraugus Creek; however, the topography of the parcel does not appear to be suitable for construction and was not considered further.

Somewhere along Schwartz Road is the next logical location for a wastewater treatment facility; however, all the parcels along this road are privately owned, many of which are currently utilized for farming or as residential properties.

The recommended site is located on a parcel of State-owned land east of the intersection of Edies Road and the former Buffalo Pittsburgh Railroad (BPRR) crossing, located just north of SSD1 (see Figure 7.2.4.1). The treatment facility would be located away from the road within an area that appears to be an old spur line from the BPRR. The abandoned railway should be able to serve as an access road. The elevation of the railroad is roughly 40 feet lower than the elevation of Edies Road; however, it appears that a roadway entrance may have previously existed just south of the rail crossing, potentially as a construction access route for the culvert under Edies Road. This location would utilize available State-owned land (shown as green hatched area in Figure 7.2.4.1), minimize impacts to adjacent farmland, utilize elevation differences to allow for gravity flow along Edies Road, and provide discharge access to Buttermilk Creek. The elevation difference between the spur line and the creek is roughly 130 feet.

Figure 7.2.4.1: Recommended location for SSD1 wastewater treatment plant.

Smaller lift stations at low locations within the district will likely be required to convey flow (i.e., crossing of Connoisarauley Creek and US 219). The lowest areas within the district are near the intersection of Miller Road and Schwartz Road.

SSD1 Wastewater Treatment Plant

Should the Town of Ashford elect to pursue this alternative, a new treatment plant would be installed to service SSD1. Assuming the new SSD1 WWTP would be in the general vicinity indicated in Figure 7.2.4.1, a State Pollutant Discharge Elimination System (SPDES) permit would be required through NYSDEC for the construction of a new outfall to Buttermilk Creek. Refer to Section 7.3 below for information on potential effluent limitations that may be encountered as part of that permitting process.

For the SSD1 WWTP, a package plant should be considered versus a conventional treatment facility. The main distinction between a package plant and a conventional plant is that package plants are modular by design, pre-assembled in the factory to the extent feasible, and skid mounted for "plug and play" operation. At a design flow of 50,000 gpd with a maximum capacity of 100,000 gpd for future growth, a package system will offer a more cost-effective solution for the Town.

The package plant considered for this alternative includes influent screening and grit removal, flow equalization, biological treatment, effluent disinfection, aerobic digestion, and solids dewatering. The biological process is assumed to be a sequencing batch reactor (SBR) and the disinfection process is assumed to be ultraviolet (UV) radiation. Most of the equipment will be located outdoors with an administration, laboratory, and controls building provided for the daily operation and maintenance of the facility.

Refer to ***Appendix F*** for a detailed cost analysis of the treatment alternatives considered.

7.2.4.2 Sanitary Sewer District No. 2

SSD2 is located on the eastern side of the Town along NYS Route 240, extending from approximately 2,300 feet south of Ashford Hollow Road north to the BPRR crossing for a total length of almost 2 miles.

Topography

NYS Route 240 in this area runs roughly parallel to Buttermilk Creek. Buttermilk Creek is located just west of SSD2 and is flowing from south to north. The areas east of SSD2 are at higher elevations which would allow for gravity flow from the extension streets (Felton Hill Road and Depot Street, etc.) west to NYS Route 240.

Along the NYS Route 240 corridor with SSD2, the elevations are highest at the southern end of the district and lowest at the northern end of the district with an approximate elevation drop of over 130 feet.

Public Property

According to the Cattaraugus County Parcel Viewer there are 3 Town of Ashford owned parcels located in the immediate vicinity of SSD2:

- Felton Road between Nos. 5229 and 5311 (Tax Map No. 20.004-1-36.9)
- 9377 NYS Route 240 (Tax Map No. 29.007-3-17)
- Dole Street, just east of 5453 Dole Street (Tax Map No. 39.011-1-3.1)

Each of these properties were deemed unsuitable for a potential wastewater treatment facility due to its elevation, existing structures or size, respectively.

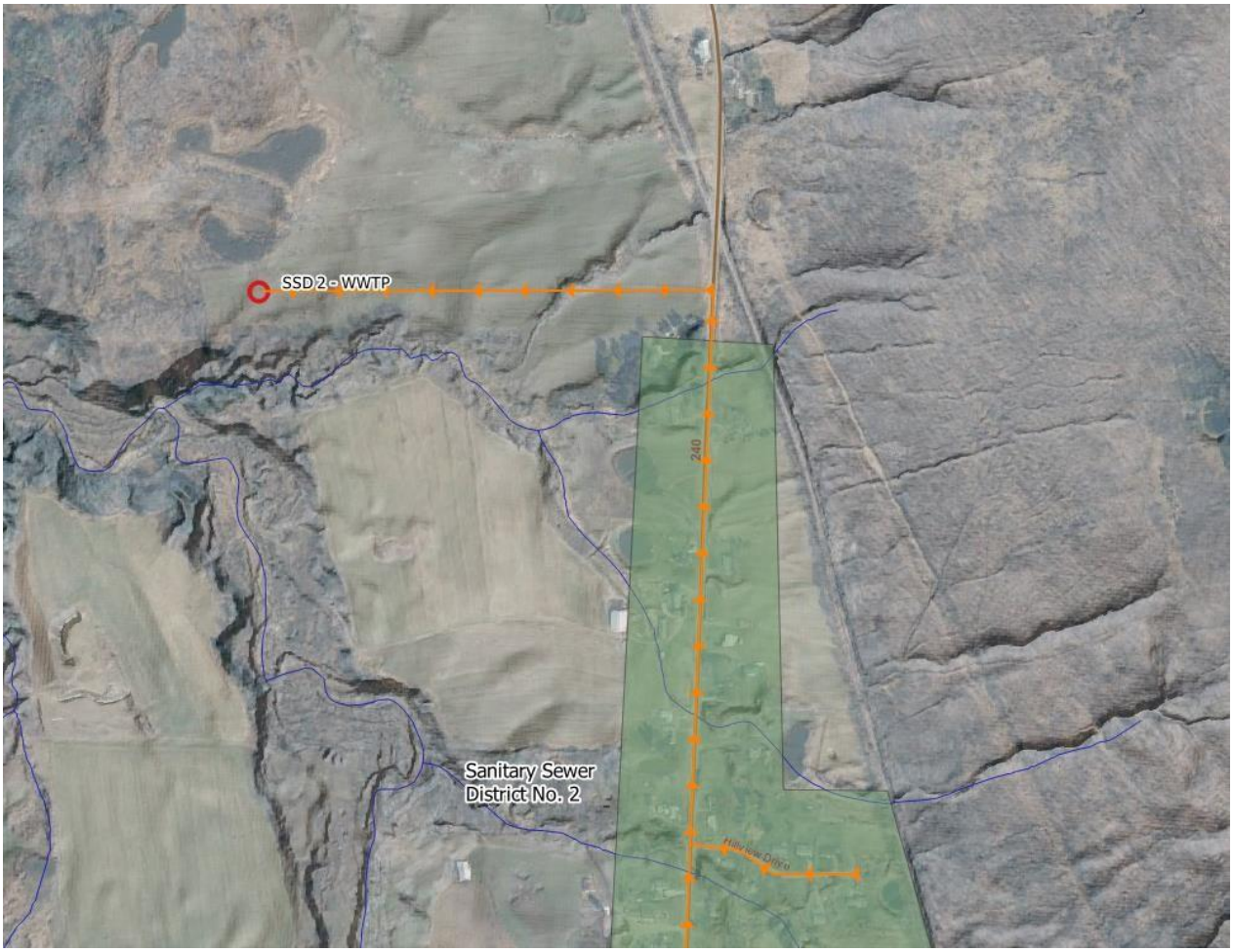
There are no State or County owned parcels identified in the immediate vicinity of SSD2.

Recommended Location

Due to the topography within SSD2, it is recommended that a wastewater treatment facility be located near the northern end of the district to maximize the potential for gravity flow through the district. Much of the undeveloped land in this area is forested or utilized for active farming operations. To minimize the take of actively used farmland, it is recommended that the wastewater treatment facility be located on Parcel No. 20-003-2-2.1, located just northwest of the intersection of NYS Route 240 and the BPRR crossing. This 171 acre parcel does not appear to be actively utilized for farming.

To construct a wastewater facility at this location, a permanent easement or subdivision of the parcel and property acquisition would be required for the treatment facility area and its access road. Depending on the location of the access road, coordination with BPRR may be required. This rail line does appear to be active. The elevation difference from the roadway to the proposed treatment facility location is approximately 50 feet. This location would allow for the wastewater treatment facility to be located away from the roadway and nearby homes. The elevation change appears to be suitable for gravity flow throughout the entire system and would provide relatively good access for discharge into Buttermilk Creek or 1 of its tributaries.

Figure 7.2.4.2: Recommended location for SSD2 wastewater treatment plant



SSD2 Wastewater Treatment Plant

Should the Town of Ashford elect to pursue this alternative, a new treatment plant would be installed to service SSD2. Assuming the new SSD2 WWTP would be in the general vicinity indicated in Figure 7.2.4.2, a SPDES permit would be required through NYSDEC for the construction of a new outfall to Buttermilk Creek. Refer to Section 7.3 below for information on potential effluent limitations that may be encountered as part of that permitting process.

At a design flow of 75,000 gpd with no anticipated future growth, a package system will offer a more cost-effective solution for the Town versus a conventional facility. As such, a package plant should be considered for the SSD2 WWTP, identical in treatment process and control to that discussed for the SSD1 WWTP above. Refer to ***Appendix F*** for a detailed cost analysis of the treatment alternatives considered.

Refer to ***Figure 5*** at the end of this report for a depiction of treatment Alternative No. 2.

7.2.5 Alternative No. 3 – Centralized WWTF for Both Sewer Districts

As a third alternative, an intermediate location was selected to provide space for a single wastewater treatment facility that would provide treatment for both SSD1 and SSD2. While it would be feasible to convey the discharge from SSD2 to the recommended facility location for SSD1 and vice versa, it was assumed that for this alternative, a separate, intermediate site would be located.

Topography

Since separately, both sanitary sewer districts were able to discharge into Buttermilk Creek, a combined treatment location would most likely be along Buttermilk Creek. SSD2 is generally at a higher elevation than SSD1 which should allow for gravity conveyance from SSD2 and would likely require pumping from SSD1.

Public Property

According to the Cattaraugus County Parcel Viewer, there is 1 Town of Ashford owned parcel located near Buttermilk Creek between SSD-1 and SSD-2:

- 5640 Fox Valley Road (Tax Map No. 20.001-1-32)

This parcel is located on Fox Valley Road just northeast of the intersection with the BPRR and is split with approximately half of the parcel north of Fox Valley Road and half south. The majority of the portion of the parcel located south of Fox Valley Road is undevelopable due to the stream that runs through the site. The northern portion of the parcel houses the Town of Ashford Highway Department. While the Town parcel appears to be significantly utilized, the parcel also bounds State-owned land and County-owned land that appear to be at least partially utilized by the Highway Department. This area appears to be the northern limit of the State-owned land associated with the West Valley Demonstration Project.

Recommended Location

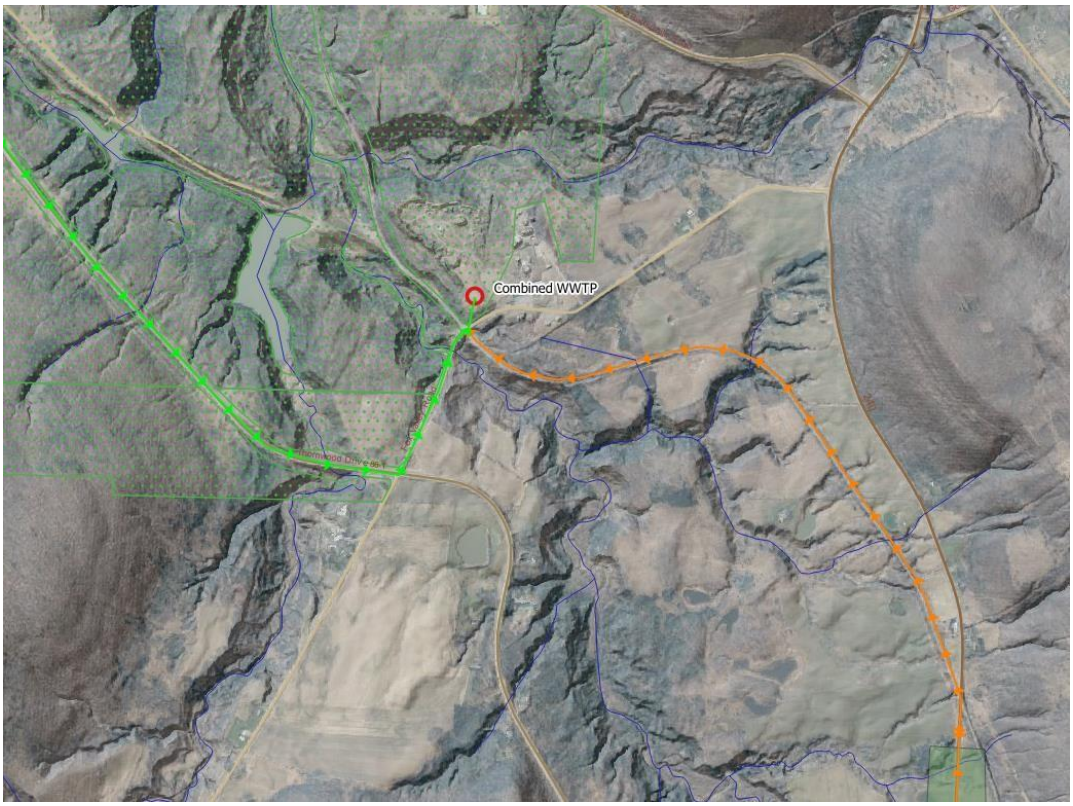
It is recommended that this State-owned land immediately adjacent to the Town of Ashford property at the Highway Department be utilized for the combined SSD1 and SSD2 wastewater treatment facility. This parcel would provide easy access for Town staff to maintain and monitor the treatment facility, would provide suitable space with room for expansion, and would provide the ability to discharge to Buttermilk Creek.

To convey discharge from SSD1 to this location, a force main would have to be constructed from the intersection of Miller Road and Schwartz Road (the lowest area in SSD1) up to the treatment facility. For the purpose of this study, it is assumed the force main will follow the existing highway right-of-way along Schwartz Road to Rock Springs

Road to Thornwood Drive to Fox Valley Road. The force main would be approximately 5.3 miles in length, 4 miles longer than what was assumed for Alternative 2.

To convey discharge from SSD2 to this location, it is believed that a gravity line would suffice. The shortest route would be to construct a gravity line parallel to the BPRR within the existing rail right-of-way. This would require an additional 1.3 miles of gravity line. While this route may be the shortest, it would require special permitting and coordination with the railroad. BPRR will likely require a long-term lease agreement to utilize its right-of-way. The long-term costs associated with the lease agreement may be cost prohibitive. A secondary route should also be considered. This continues the gravity line north on NYS Route 240 to Fox Valley Road, then down Fox Valley Road to the treatment facility. It is believed that this route should still allow for gravity flow. This route is an additional 1.7 miles of pipe.

Figure 7.2.5.1: Recommended location for combined treatment facility for SSD1 and SSD2



SSD1 and SSD2 Joint Wastewater Treatment Plant

Should the Town of Ashford elect to pursue this alternative, a new treatment plant would be installed to service both SSD1 and SSD2. Assuming the new SSD1 and SSD2 joint WWTP would be in the general vicinity indicated in Figure 7.2.5.1, a SPDES permit would be required through NYSDEC for the construction of a new outfall to Buttermilk

Creek. Refer to Section 7.3 for information on potential effluent limitations that may be encountered as part of that permitting process.

For the SSD1 and SSD2 joint WWTP, both a package plant and a conventional treatment facility should be considered. At a design flow of 175,000 gpd including provisions for future growth, a conventional facility may be cost competitive with a package plant of the same size.

The package plant considered for this alternative includes influent screening and grit removal, flow equalization, biological treatment, effluent disinfection, aerobic digestion, and solids dewatering. The biological process is assumed to be a sequencing batch reactor (SBR) and the disinfection process is assumed to be ultraviolet (UV) radiation. The majority of the equipment will be located outdoors with an administration, laboratory, and controls building provided for the daily operation and maintenance of the facility.

The conventional treatment facility will utilize concrete tanks built on-site with the equipment provided by the individual manufacturers. The same unit processes will be considered in the design including influent screening and grit removal, flow equalization, biological treatment, effluent disinfection, aerobic digestion, and solids dewatering. The conventional treatment facility will include an administration, laboratory, and controls building as well. Refer to ***Appendix F*** for a detailed cost analysis of the treatment alternatives considered.

Refer to ***Figure 6*** at the end of this report for a depiction of the project.

7.3 Design Criteria

The proposed project will be designed in accordance with state and federal guidelines including Recommended Standards for Wastewater Facilities (RSWW).

Alternative 1 proposes utilizing the existing Village of Springville WWTP. Since that facility already has a SPDES permit, no additional permit requirements are anticipated. However, if it is determined that an increase in total plant capacity is needed to accept the flow from SSD1 and SSD2, modifications to the total allowable flow for the Springville WWTP will be required.

Alternatives 2 and 3 each propose creating new discharge locations into Buttermilk Creek. Buttermilk Creek is a NYSDEC Class C stream; therefore, no special effluent limitations requiring provisions for nutrient removal technologies are expected. There are 2 existing SPDES discharge permits in this area for outfalls that discharge to streams and wetlands that are tributaries to Buttermilk Creek:

- SPDES NY-0269271 – NYSERDA – Issued for stormwater discharges from the West Valley Demonstration Project
- SPDES NY-0000973 – US Department of Energy – Issued for process wastewater as well as sanitary wastewater associated with the West Valley Demonstration Project.

Based on these permits, Table 7.3.1 provides the effluent limitations that would likely be required for the Town of Ashford's wastewater treatment facility (taken from SPDES NY-0000973).

Table 7.3.1: Potential Effluent Discharge Limitations for Buttermilk Creek

Parameter	Effluent Limit or Calculated		Units	Sample Frequency	Sample Type
	Monthly Average	Daily Max			
pH	6.5	8.5	SU	2/Month	Grab
DO	3	Monitor	mg/l	2/Month	Grab
Flow	Monitor	Monitor	MGD	Monthly	Continuous
Oil & Grease	Monitor	15	mg/l	2/Month	Grab
Solids, Total Suspended	30	45	mg/l	2/Month	24-hr. comp.
Solids, Settleable	Monitor	0.3	ml/l	2/Month	Grab
Solids, Total Dissolved	Monitor	Monitor	mg/l	2/Month	Grab
BOD_5	Monitor	10	mg/l	2/Month	24-hr. comp.
Ammonia (as NH_3)	1.49	2.1	mg/l	2/Month	24-hr. comp.
TKN (as N)	Monitor	Monitor	mg/l	Monthly	24-hr. comp.
Nitrite (as N)	Monitor	0.1	mg/l	Monthly	24-hr. comp.
UOD	Monitor	22	mg/l	Monthly	Calculated
Iron, Total	Monitor	Monitor	mg/l	2/Month	24-hr. comp.
Chlorine, Total Residual	Monitor	0.005	mg/l	Monthly	Grab
Mecury, Total	Monitor	0.7	ng/l	Monthly	Grab
Chloroform		0.2	mg/l	1/Year	Grab

7.4 Map

Figures 2 through 5 at the end of this report show the overall location of the proposed treatment alternatives. ***Figure 7*** shows the preliminary layout of the collection system throughout the proposed sewer districts.

7.5 Environmental Impacts

There are no anticipated negative environmental impacts associated with any alternative. The majority of the sewer construction would be done in existing road right-of-ways or temporary construction easements, and sewer and WWTF construction would implement proper construction mitigation and restoration efforts.

Regardless of the project that is selected, a State Environmental Quality Review (SEQR) will be completed that will include a coordinated review with any involved or interested agency. The SEQR process will define any potential environmental impacts and outline ways to mitigate those impacts (minor or major).

While the project will eliminate many individual private systems, it will create a point load in a local waterway. This will either fall within a SPDES Permit for an existing WWTF or through a new SPDES Permit for a new WWTF owned and operated by the Town of Ashford. The potential discharge points for a new WWTF include Connoisauarely Creek and Buttermilk Creek

7.6 Land Requirements

The proposed improvements are anticipated to be performed primarily in public right-of-ways, but permanent easements will be required in some locations. However, treatment alternatives 2 and 3 may require a land purchase or easement acquisition for installation of the new WWTF. Land and/or easement acquisition for this Alternative would be required to be in place prior to construction.

7.7 Potential Construction Problems

In general, potential obstacles expected during construction are seasonally high groundwater elevations and unstable soils. However, properly designed sheeting and shoring systems and a well point dewatering system, may be utilized to address these concerns. Some specific comments to each service area and treatment alternative are provided below:

Sewer District No. 1 – Existing underground utility conflicts, narrow NYSDOT right-of-way in some locations, private septic conflicts, multiple creek crossings, and potential easements.

Sewer District No. 2 – Existing underground utility conflicts, narrow NYSDOT right-of-way, potential easements, railroad crossing, multiple creek crossings, and private septic conflicts.

Treatment Alternative No. 1 – Railroad crossing, multiple creek crossings, existing underground utility conflicts, intermunicipal agreements, potential easements.

Treatment Alternative No. 2 – Railroad crossing, existing underground utility conflicts, land acquisition to secure a site for the dedicated WWTP's, potential easements.

Treatment Alternative No. 3 – Multiple creek crossings, existing underground utility conflicts, floodplain concerns, potential easements.

8 Alternative Selection

8.1 Operation Cost Analysis

Alternative No. 1 – Connect to the Village of Springville WWTP

Sending flows to a WWTF owned and operated by a neighboring municipality will result in a bill from that municipality. Sending the flow from SSD1 and SSD2 to the Village of Springville WWTP will result in a sewer use charge billed to the Town of Ashford based on actual flows measured via the Town's master meter. For purposes of this feasibility analysis, it is assumed that the sewer use charge to the Town will be 1.5 times their residential rates which is a reasonable assumption based on other municipalities in the Southern Tier. Based on Springville's current rate of $3.75 per 1,000 gallons, with an effective date of May 1, 2019, the assumed sewer use rate for Ashford would be $5.63 per 1,000 gallons or as much as $359,300 per year.

Further to the one-time capital cost to upgrade the Springville WWTP to handle the additional 175,000 gpd anticipated from SSD1 and SSD2 and the monthly sewer use charge, the Town will be responsible for the O&M of the collection system, pump stations, and master meter vault. This is estimated to be $437,306 per year and includes disposal fees, odor control, billing/record keeping, short lived assets, sewer operator, electric, insurance, telephone, and vehicle costs.

Alternative No. 2 – SSD1 WWTP and SSD2 WWTP

Owning and operating 2 separate WWTPs for SSD1 and SSD2 will result in significant O&M costs for the Town. In addition to the daily operational costs associated with the WWTPs, the Town will also be responsible for the O&M of their collection system and pump stations. This is estimated to be $133,300 per year and includes utilities, billing, staffing, odor control, and short-lived assets.

Alternative No. 3 – SSD1 and SSD2 Joint WWTP

Owning and operating a joint WWTP for SSD1 and SSD2 may cost more from an initial capital investment standpoint but may result in some savings from an O&M perspective when compared to Alternative No. 2. In addition to the daily operational costs associated with the WWTP, the Town will also be responsible for the O&M of their collection system, pump stations, and transmission mains. This is estimated to be $137,300 per year and includes utilities, billing, staffing, odor control, and short-lived assets.

Treatment Alternates No. 2 and 3 assume the Town of Ashford will construct their own WWTF. The resulting total annual operation and maintenance costs are as follows.

O&M COST ESTIMATE SUMMARY

Treatment Alternative	Total Annual Cost
1	$437,300
2	$133,300
3	$137,300

Details of the cost identified above are shown in ***Appendix G*** at the end of this report.

8.2 Capital Cost Analysis

As noted previously in this report, the collection system will consist of Sewer District No. 1 & Sewer District No. 2 (hamlet of West Valley). The total estimated capital cost for the collection system is $7,360,300.

The following tables show a summary of total capital project costs for each service area collection system and each treatment alternative. Detailed cost estimates are included in ***Appendix F***.

COLLECTION SYSTEM COST ESTIMATE SUMMARY

Sewer District	Total Capital Project Cost
1	$3,720,000
2	$3,640,300
TOTAL	**$7,360,300**

TRANSMISSION AND TREATMENT ALTERNATIVES COST ESTIMATE SUMMARY

Alternative	Total Capital Project Cost
1	$7,862,600
2	$5,722,500
3	$7,215,700

The highest treatment alternative is Alternative No. 1, force main and connection to the Springville WWTF with a cost of $7,862,600. The primary reason for the high cost is the lack of available capacity at the Springville WWTF, so significant upgrades are required. Additionally, the total required length of transmission mains increases the total cost substantially.

The lowest treatment alternative is Alternative No. 2, dedicated package WWTP's for each proposed sewer district with a cost of $5,722,500. This alternative locates these WWTP's close to the proposed sewer districts which allows for shorter transmission mains and reduces overall capital costs.

TOTAL CAPITAL COST ESTIMATE SUMMARY

Treatment Alternative	Treatment & Transmission Cost	Collection System Cost	Total Capital Cost
1	$7,862,600	SSD1 - $3,720,000 SSD2 - $3,640,300	$15,222,900
2	$5,722,500	SSD1 - $3,720,000 SSD2 - $3,640,300	$13,082,800
3	$7,215,700	SSD1 - $3,720,000 SSD2 - $3,640,300	$14,576,000

The Town is unable to take on a project of this size. Phasing options are considered below:

Option 1A: Construction of SSD1 LPS collection system and connection to Springville WWTP.
Option 2A: Construction of SSD1 LPS collection system and dedicated package plant.
Option 3A: Construction of SSD1 LPS collection system and construction of centralized WWTP.

PHASING OPTIONS COST ESTIMATE SUMMARY

Phasing Options	Treatment & Transmission Cost	Collection System Cost	Total Capital Cost
1A	$6,174,400	SSD1 - $3,720,000	$9,894,400
2A	$3,056,400	SSD1 - $3,720,000	$6,776,400
3A	$5,930,000	SSD1 - $3,720,000	$9,650,000

Option 1B: Construction of SSD2 gravity collection system and connection to Springville WWTP.
Option 2B: Construction of SSD2 gravity collection system and dedicated package plant.
Option 3B: Construction of SSD2 gravity collection system and construction of centralized WWTP.

PHASING OPTIONS COST ESTIMATE SUMMARY

Phasing Options	Treatment & Transmission Cost	Collection System Cost	Total Capital Cost
1B	$7,862,600	SSD2 - $3,640,300	$11,502,900
2B	$2,666,000	SSD2 - $3,640,300	$6,306,300
3B	$4,125,000	SSD2 - $3,640,300	$7,765,300

Based on total capital cost estimate, constructing 1 sewer district at a time with its own dedicated package WWTP will be the most manageable solution for the Town of Ashford.

8.3 Recommendation – Proposed Project

It is recommended that the Town seek funding to advance with the Sewer District No. 1 and Sewer District No. 2 collection system along with Treatment Alternative No. 2 with a phased approach starting with SSD2 and Treatment Alternative No. 2 Option 2B, followed by SSD1 and Treatment Alternative No. 2 Option 2A. This will combine the high priority areas for establishing a collection system within the Town with the most cost-effective treatment alternative.

8.4 Preliminary Project Design

8.4.1 Collection System

Wastewater will be collected and transmitted through new gravity and force mains within the project area and then to a new package WWTP.

8.4.2 Pumping Stations

Based on preliminary topography review and collection system layout, several pump stations are required for SSD1 and SSD2. SSD1 assumes 2 new pump stations To serve the proposed district and SSD2 assumes 1 new pump station to serve the hamlet of West Valley.

8.4.3 Treatment

Wastewater will be transmitted to a new package WWTF owned by the Town of Ashford. The WWTF will have sufficient capacity to treat the anticipated average daily, peak daily, and future flows from the proposed Sewer District.

8.4.4 Services

The portion of the sewer service from the right-of-way to the main line will be installed under this project. The portion from the right-of-way to the building will be the responsibility of the owner.

8.5 Project Schedule

The following anticipated timeframes are considered typical after funding for the project is obtained:

- Design and Permitting 6-9 months
- Bidding 2 months
- Construction 18-24 months

8.6 Permit Requirements

The proposed project is anticipated to require permits and approvals from the following agencies:

- New York State Department of Environmental Conservation
- U.S. Army Corps of Engineers
- New York State Department of Transportation
- Cattaraugus County Health Department
- Town of Ashford

8.7 Sustainability Considerations

8.7.1 Water and Energy Efficiency

The Town of Ashford is committed to evaluating all alternates for providing sewer service to the Town while also considering the financial impact and the expected life cycles of the system components.

The selected alternative will consider the number of existing and proposed pumping facilities in the system and look to minimize the number of times sewage is pumped. However, if required, any new pumping facilities will utilize premium efficiency motors and pumps along with variable speed drives in an effort to minimize electrical costs.

Design of the collection system, based on recent standards and more modern pipe technologies will ensure that groundwater infiltration into the new system is minimized long-term, saving money in treatment and pumping costs.

Should a new WWTF be constructed in the Town, treatment equipment and technologies will be selected that will result in the lowest life cycle costs. This includes high efficiency motors and low energy use treatment methods.

8.7.2 Green Infrastructure

New alternative construction methods and materials will be considered during the design of the project, such as recycled products and solar power supplements at pumping facilities.

8.8 Funding Options

8.8.1 Clean Water State Revolving Funds

The United States Environmental Protection Agency (EPA) allocates funds to New York State through the Environmental Facilities Corporation (NYSEFC) for the Clean Water State Revolving Fund Loan Program (CWSRF) and Drinking Water State Revolving Fund (DWSRF). The CWSRF and DWSRF allocate funds to all communities, giving no priority to any project based on the size of the community. The CWSRF program primarily provides funds to assist in the construction of publicly owned wastewater treatment plants, as well as pollution management and estuary management.

For a project to be eligible for funding under the CWSRF, it must include construction or upgrading of a wastewater treatment plant or collection system. This includes construction or upgrading devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage. Funds are not provided for maintenance or operation of facilities.

The CWSRF provides several different types of assistance including zero interest short-term loans and low interest long-term loans. Grants (in the form of principal forgiveness) and subsidized loans may be available for communities that can demonstrate financial

hardship based on median household income (MHI). Subsidized loans can have interest rates as low as 0% and are typically financed over a 30-year period. To be eligible for the loan, the project must serve residential populations and must be environmentally significant as determined by the commissioner of the New York State Department of Environmental Conservation (NYSDEC). In addition, the total project cost cannot be more than $14 million.

Beginning October 1, 2019, the EFC began qualifying municipalities with a Median Household Income (MHI) less than the 2013 Statewide MHI ($58,003) for hardship financing based on publicly available census data. The MHI for the Town of Ashford is $48,750 (2013) according to the U.S. Census Bureau. Based on the Town's MHI, the Town would qualify for financial hardship.

8.8.2 United States Department of Agriculture (USDA)

The USDA provides loans and grants to communities with no more than 10,000 people or to rural communities with no population limits. In order for the community to be eligible for these loans and/or grants it must:

- Be unable to commercially obtain a loan at reasonable rate/terms,
- Have the ability to repay the loan, and
- Maintain and operate the facilities, and the new facilities must be in compliance with all laws and standards.

The programs are administered on a national level by the Rural Utilities Service, a branch of the USDA, through state offices that distribute the funds to districts and municipalities. Funding is formulated based on rural population, poverty, and unemployment.

The program is implemented to provide rural communities with basic human amenities and to promote growth of these rural areas. The program allocates funds for installation, repair, maintenance, or expansion of current facilities.

Loan stipulations include repayment of the loan within 40 years or by the end of the design life (the lesser of the 2). Loans come directly from the USDA or are from commercial third-party lenders, in which case 90% is guaranteed by the USDA.

The USDA may award grants if the project is within a low to medium MHI range. Eligible projects must take place in a community where the population is not projected to decline below the designed project population. The maximum grant amount is based on MHI of the service area. For a service area with an MHI less than $45,505 (Poverty Line), the maximum grant is 75% of the project cost or a maximum of $750,000; if the MHI is between $45,505 and $56,822 then the maximum grant amount is 45% of the cost of the project or a maximum of $500,000; and if the MHI is greater than $56,882, then there is no grant available. The grants are used to reduce costs to a reasonable level for the municipality, and they can be used in conjunction with loans if the community is able to repay only part of the project cost.

The MHI for the Town of Ashford is $48,750 according to the U.S. Census Bureau. Based on the MHI, the Town of Ashford would automatically qualify for intermediate grant funding, which is equal to 45% of the project cost or a maximum of $500,000.

The USDA also provides grants to fund nonprofit organizations that provide technical support and training to rural communities with regard to water and waste disposal. There are several organizations operating throughout the country with offices in each state.

8.8.3 Community Development Block Grant

The Office of Community Renewal, an office within the New York State Homes & Community Renewal (NYSHCR), administers the Community Development Block Grant (CDBG) program, previously operated as the "Small Cities" program. The CDBG is a program designed to provide direct assistance to small, rural communities in New York State. Funding, in the form of grants, is typically allocated to small communities with aging infrastructure that require updating or expansion.

To be eligible, the community must demonstrate a need for the upgrade or expansion in response to a public health issue from failing public or private sewer systems. Communities must also have a population below 50,000 people and demonstrate low to moderate income levels.

Towns, villages, and cities are eligible to receive grants up to $750,000 for public infrastructure (water/sewer only) projects through the CDBG program. One application per year is accepted per project annually, but a municipality could conceivably be awarded multiple grants over multiple years for the same project by applying for different parts of a project over those years.

8.8.4 NYS Water Infrastructure Improvement Act (WIIA) Grant

The NYSEFC has allotted money to be provided as grants to assist municipalities in the improvement of their drinking water or wastewater infrastructure. The clean water grants are awarded up to a maximum amount of $5 million or 25% of the project costs for water quality improvements for projects under $50 million and are given directly to the approved applicant.

The state awarded $175 million in August 2016 to water or wastewater improvement projects throughout the state. Round 3, The Clean Water Infrastructure Act of 2017, invests $2.5 billion in clean and drinking water infrastructure projects and water quality protection across New York. It is set to provide at least $1 billion for the WIIA grant program.

Communities in New York State with water or wastewater infrastructure improvement projects are legible for the grant program. Consideration and preference for award of funds is based on the potential impact on water quality of the proposed improvement projects. Consideration does not rely upon a minimum or maximum community size nor is it based on a standard MHI level.

8.9 Annual Budget

8.9.1 Income

Revenue for the Sewer District will be generated by collecting annual sewer use and debt service fees from the users within the Sewer District. The operational budget is included in ***Appendix G***.

8.9.2 Annual O & M Costs

Annual Operation and Maintenance (O&M) costs have been reviewed for all treatment alternatives analyzed. Detailed calculations for the O&M costs are included as part of the Annual Operating Budget in ***Appendix G***.

8.9.3 Debt Repayments

The Alternative selected would develop a new Sewer District and therefore would not have any existing debt service associated with the District. For new construction, debt service would be divided among the units associated with the project and collected on property tax bills.

8.10 Short-Lived Asset Reserve

A Short-lived Asset Reserve will be built into the annual O&M of the Sewer District to help absorb the costs of replacements. ***Appendix F*** contains detailed calculations of the Short-Lived Asset Reserve amount determination.

8.11 Total Project Cost Estimate

Based on the typical funding available and all associated costs as outlined above, the estimated average Sewer District No. 1 unit costs for the Town of Ashford are shown below.

SSD1	
NYSEFC Low Interest Loan	
Total Estimated Project Cost	$6,776,400
Annual Debt Service (30 years, 2.0%)	$345,727
Debt Service/Unit (174 units)	$1,986.96
Annual Town O&M Costs per unit	$765.71
Total Estimated Average Unit Cost/Year (Rounded)	**$2,753**

The annual unit cost of $2,753 far exceeds the typical annual unit costs for public sewer in the area. To reduce the annual costs, the Town should target grant funding and a lower interest loan. The example below shows a 0% loan from the NYSEFC and a grant of $4,000,000 from various agencies.

SSD1	
NYSEFC Low Interest Loan	
Total Estimated Project Cost	$6,776,400
Grant Funding	$4,000,000
Loan	$2,776,400
Annual Debt Service (30 years, 0%)	$92,547
Debt Service/Unit (174 units)	$531.88
Annual Town O&M Costs per EDU	$765.71
Total Estimated Average Unit Cost/Year (Rounded)	**$1,298**

Based on the typical funding available and all associated costs as outlined above, the estimated average Sewer District No. 2 unit costs for the Town of Ashford are shown below.

SSD2	
NYSEFC Low Interest Loan	
Total Estimated Project Cost	$6,306,400
Annual Debt Service (30 years, 2.0%)	$321,748
Debt Service/Unit (249 units)	$1,290.55
Annual Town O&M Costs per EDU	$534.41
Total Estimated Average Unit Cost/Year (Rounded)	**$1,825**

The annual unit cost of $1,825 far exceeds the typical annual unit costs for public sewer in the area. To reduce the annual costs, the Town should target grant funding and a lower interest loan. The example below shows a 0% loan from the NYSEFC and a grant of $4,000,000 from various agencies.

SSD2	
NYSEFC Low Interest Loan	
Total Estimated Project Cost	$6,306,400
Grant Funding	$4,000,000
Loan	$2,306,400
Annual Debt Service (30 years, 0%)	$76,880
Debt Service/Unit (249 units)	$308.76
Annual Town O&M Costs per EDU	$535.07
Total Estimated Average Unit Cost/Year (Rounded)	**$844**

9 Environmental Review

The primary and secondary impacts associated with development of Sewer District No. 1, Sewer District No. 2, and Treatment Alternative No. 2 are as follows:

9.1 Water Quality

- Impact: Potentially Beneficial. The proposed formation of a municipal sewer district and infrastructure will provide safe and reliable sanitary service to the residents of the Town and Village of Ashford and will eliminate the public health and safety risks associated with the individual treatment systems in the service area.

- Mitigation: There is no short or long-term mitigation expected for water quality.

9.2 Water Supply

- Impact: Primary. The introduction of new WWTP's will have a direct impact to Buttermilk Creek and the Genesee River by increasing the nutrient loading at the point of discharge and potentially downstream.

- Mitigation: The new WWTF will be required to conform to the current NYSDEC SPDES discharge permit standards intended to result in no negative water quality impact.

9.3 Noise Levels

- Impact: Primary. Construction impacts will occur in terms of construction noise from equipment and installation of sanitary mains, pump stations, and the new package treatment plants. Long-term operation will not result in any primary or secondary impacts.

- Mitigation: Construction activities will be limited to daytime hours only to minimize impacts from noise on residential areas. All construction will also be coordinated closely with the New York State Department of Conservation, New York State Department of Transportation, and the Town to avoid disruption as much as possible.

9.4 Air Quality

- Impact: There are no anticipated adverse impacts associated with air quality.

- Mitigation: There is no short or long-term mitigation expected for air quality.

9.5 Population Growth

- Impact: Secondary. Development of a municipal sewer and WWTF could potentially foster growth within the Town.

- Mitigation: The Town will ensure any growth is limited by ensuring zoning and Comprehensive Plans are updated.

9.6 Wetlands

- Impact: There are no anticipated adverse impacts associated with wetlands. It is anticipated that construction will avoid any mapped wetlands within the project area.

- Mitigation: There is no short or long-term mitigation expected for wetlands.

9.7 Floodplains

- Impact: There are no anticipated adverse impacts associated with floodplains. The construction of pump stations and WWTF will attempt to avoid any floodplains, and minimal filling operations will be conducted within any floodplain where construction is unavoidable.

- Mitigation: The Town will attempt to locate pump stations and the WWTF outside of any floodplain, but where unavoidable the fill volume will be minimized.

9.8 Environmentally Sensitive Areas

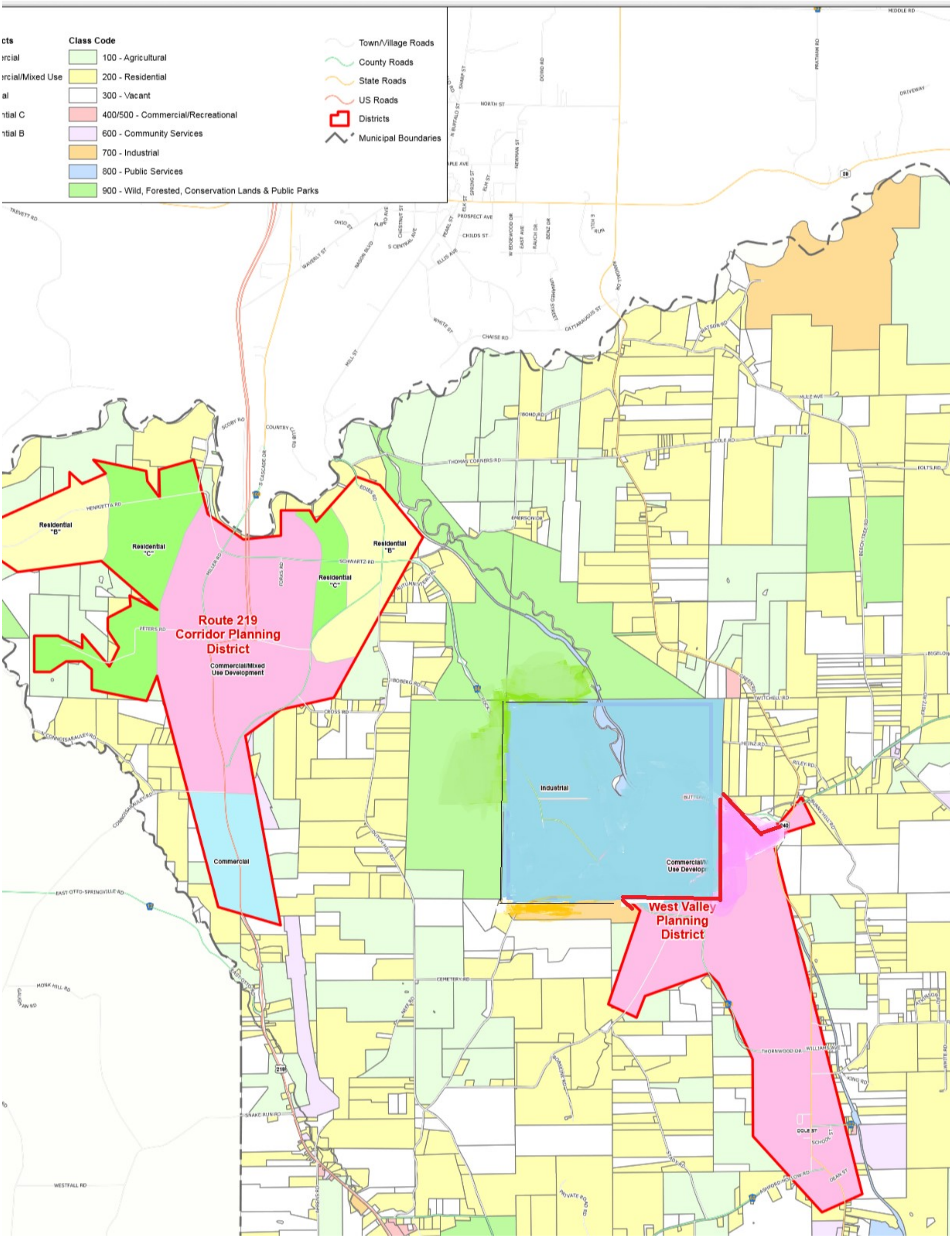
- Impact: There are no anticipated adverse impacts associated with environmentally sensitive areas.

- Mitigation: There is no short or long-term mitigation expected for environmentally sensitive areas.

10 Conclusions and Recommendations

The Town of Ashford is committed to the prospect of providing safe, reliable collection and conveyance of wastewater for its residents. This specific project will be instrumental in achieving that goal. It is recommended that the Town of Ashford seek funding for completion of the project as outlined in previous sections of this report.

Figures



Class Code
100 - Agricultural
200 - Residential
300 - Vacant
400/500 - Commercial/Recreational
600 - Community Services
700 - Industrial
800 - Public Services
900 - Wild, Forested, Conservation Lands & Public Parks
Town/Village Roads
County Roads
State Roads
US Roads
Districts
Municipal Boundaries
Residential "B"
Residential "C"
Residential "B"
Residential "C"
Route 219 Corridor Planning District
Commercial/Mixed Use Development
Commercial
Industrial
West Valley Planning District
HENRIETTA RD
SCHWARTZ RD
PETERS RD
CROSS RD
BOBERG RD
THOMAS CORNERS RD
EMERSON DR
BOND RD
COLE RD
HULE AVE
WATSON RD
TWITCHELL RD
HEINZ RD
RILEY RD
CEMETERY RD
SNAKE RUN RD
EAST OTTO-SPRINGVILLE RD
MONK HILL RD
WESTFALL RD
THORNWOOD DR
WILLIAMS AVE
KING RD
DOLE ST
SCHOOL ST
DEAN ST
ASHFORD HOLLOW RD
PRIVATE ROAD RD
NORTH ST
PROSPECT AVE
CHILDS ST
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WHITE ST
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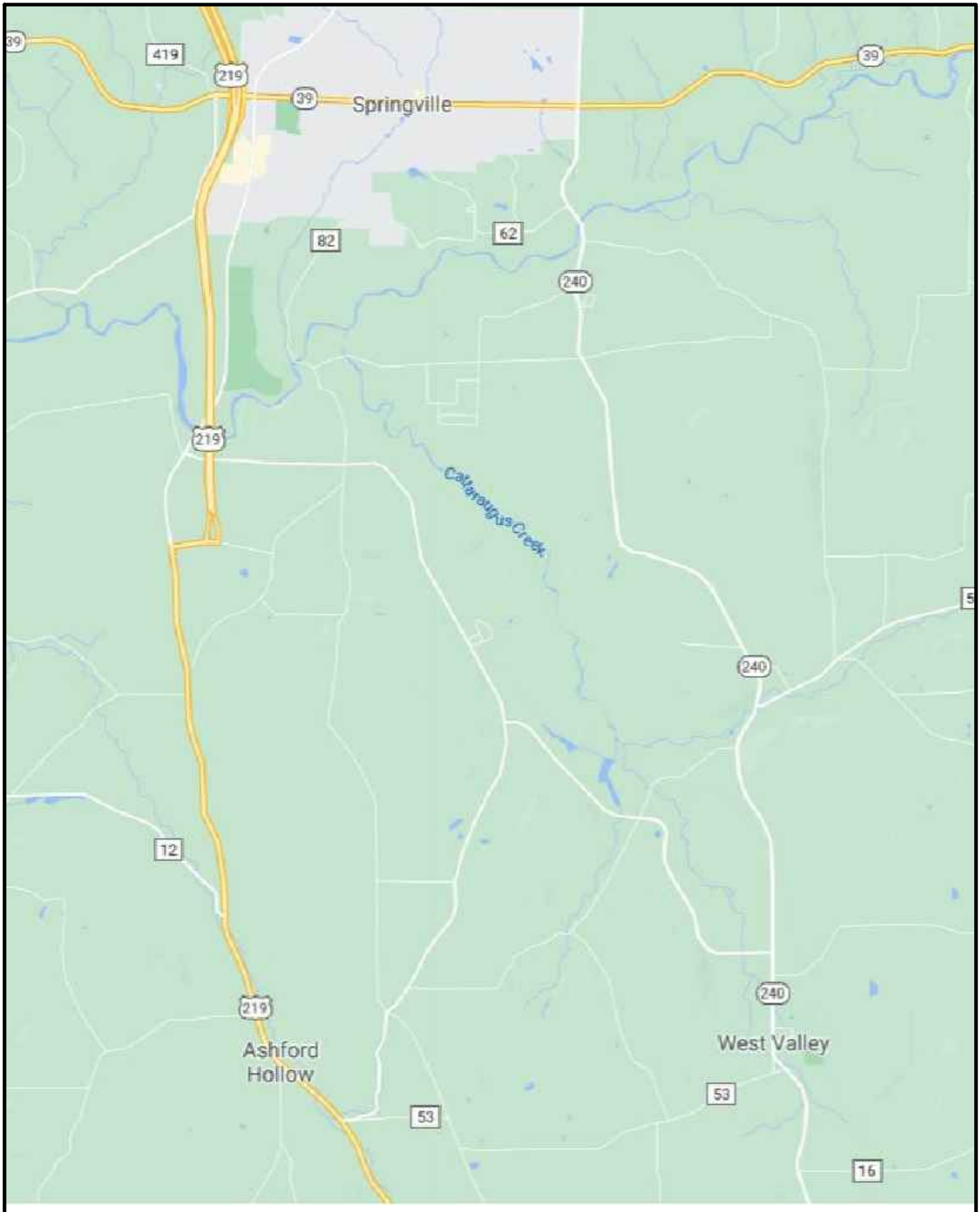
COUNTRY CLUB RD
SCOBY RD
MIDDLE RD
DRIVEWAY
BIGELOW



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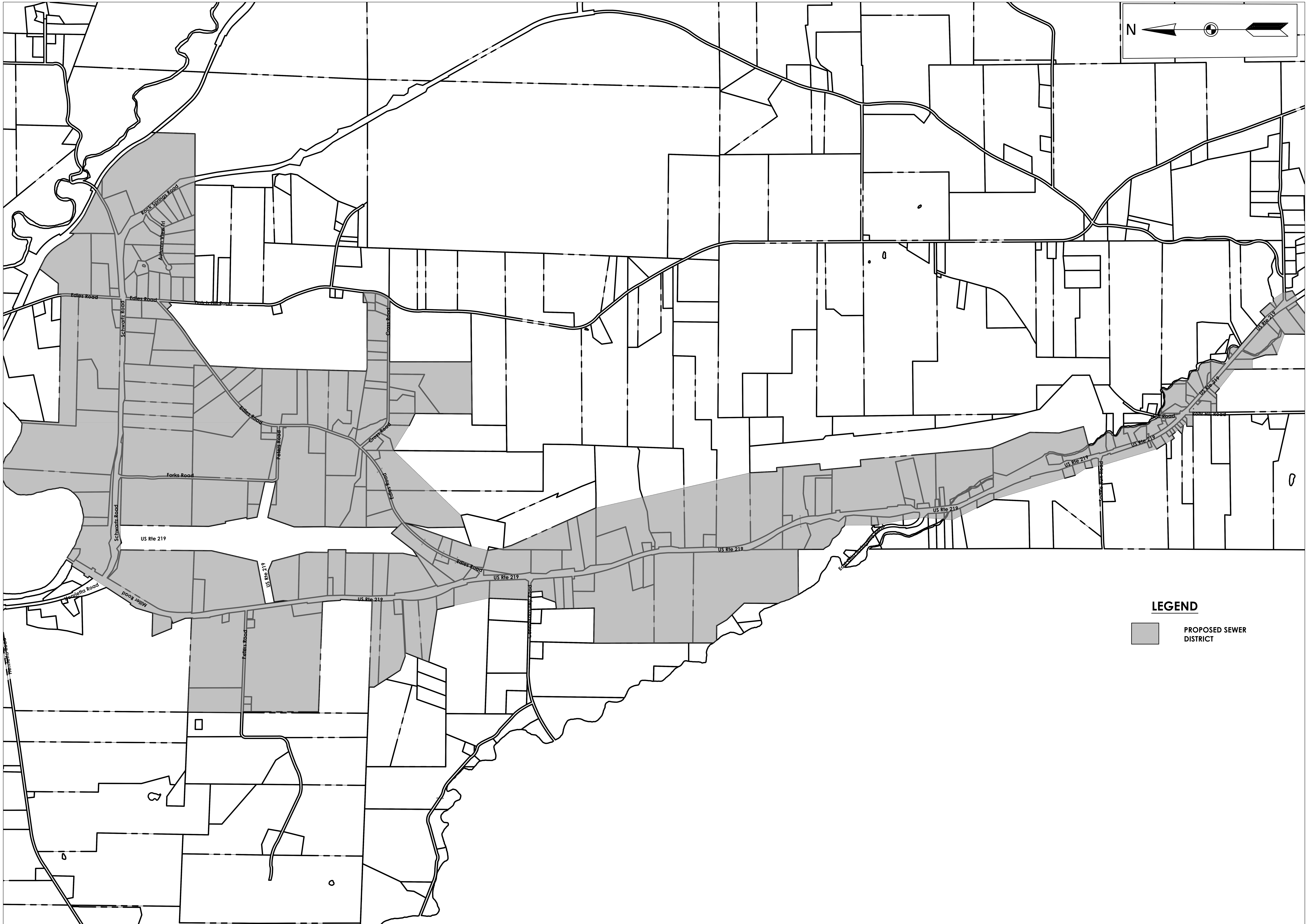
PROJ. #:	15097.00

FIG-02 - GENERAL LOCATION MAP

ASHFORD SEWER DISTRICT 1

ASHFORD, NEW YORK



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PROJECT INFORMATION

Project Number
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Project Name
SEWER FEASIBILITY STUDY

Project Address

REVISION SCHEDULE

No.	Date	Description

SHEET INFORMATION

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Drawing Title
SEWER DISTRICT No. 1

Drawing Number
FIG 03

Revision Number
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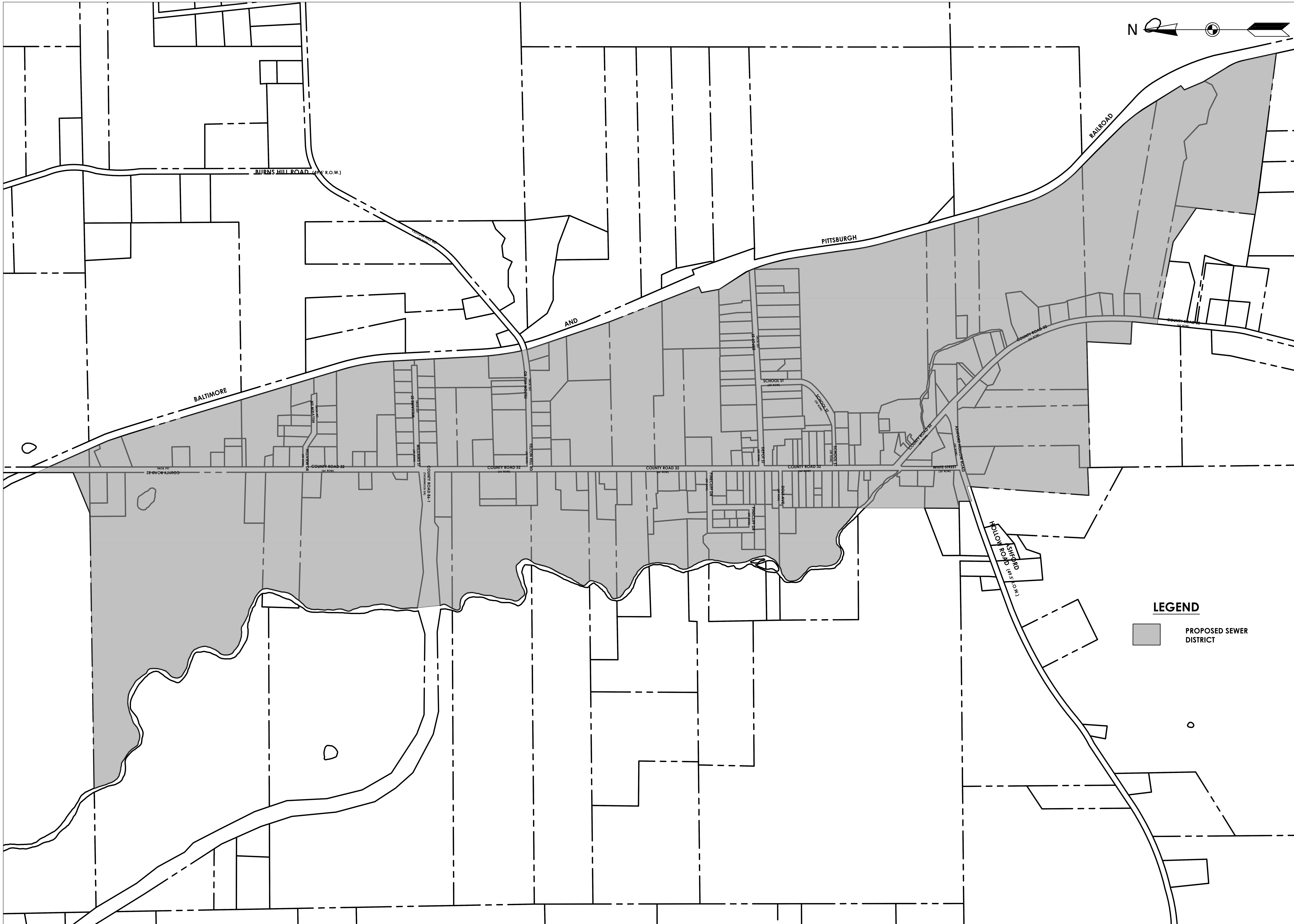

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Drawing Title
SEWER DISTRICT No. 2

Drawing Number
FIG 03

Revision Number
0

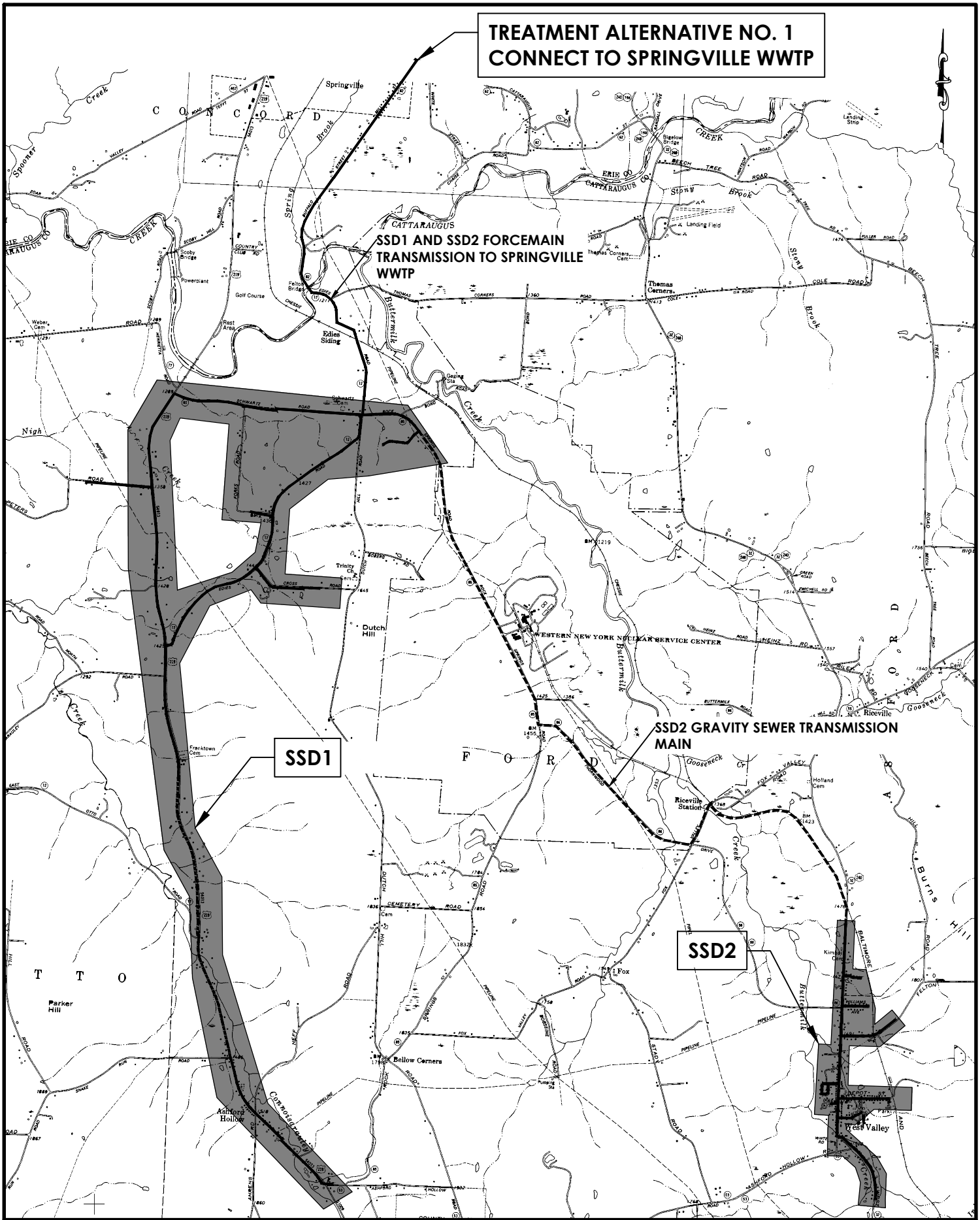

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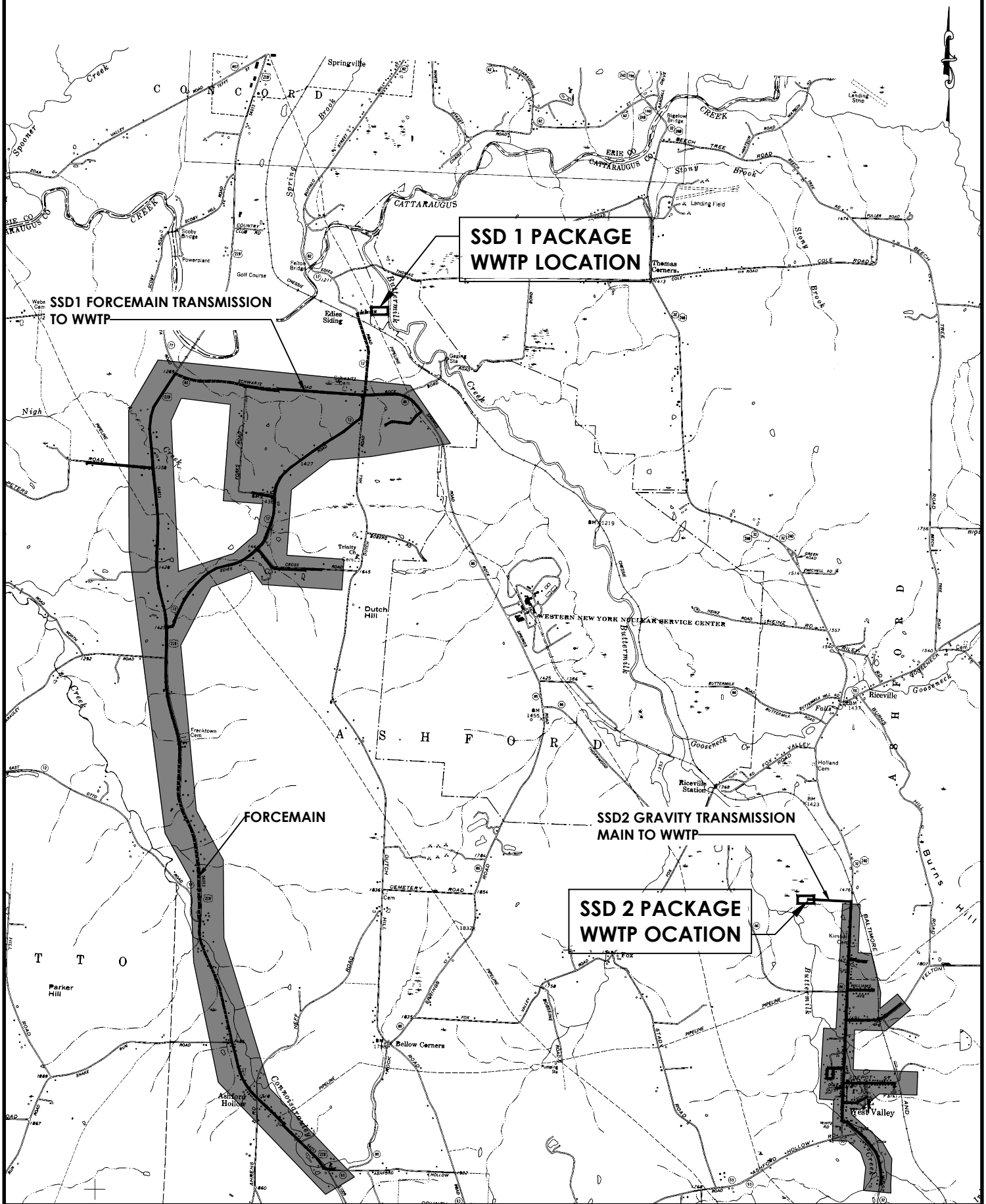
FIG-04 TREATMENT ALTERNATIVE NO. 1

ASHFORD SEWER DISTRICT 1

ASHFORD, NEW YORK



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PROJ. #:	15097.00

FIG-05 TREATMENT ALTERNATIVE NO. 2

ASHFORD SEWER DISTRICT 1

ASHFORD, NEW YORK

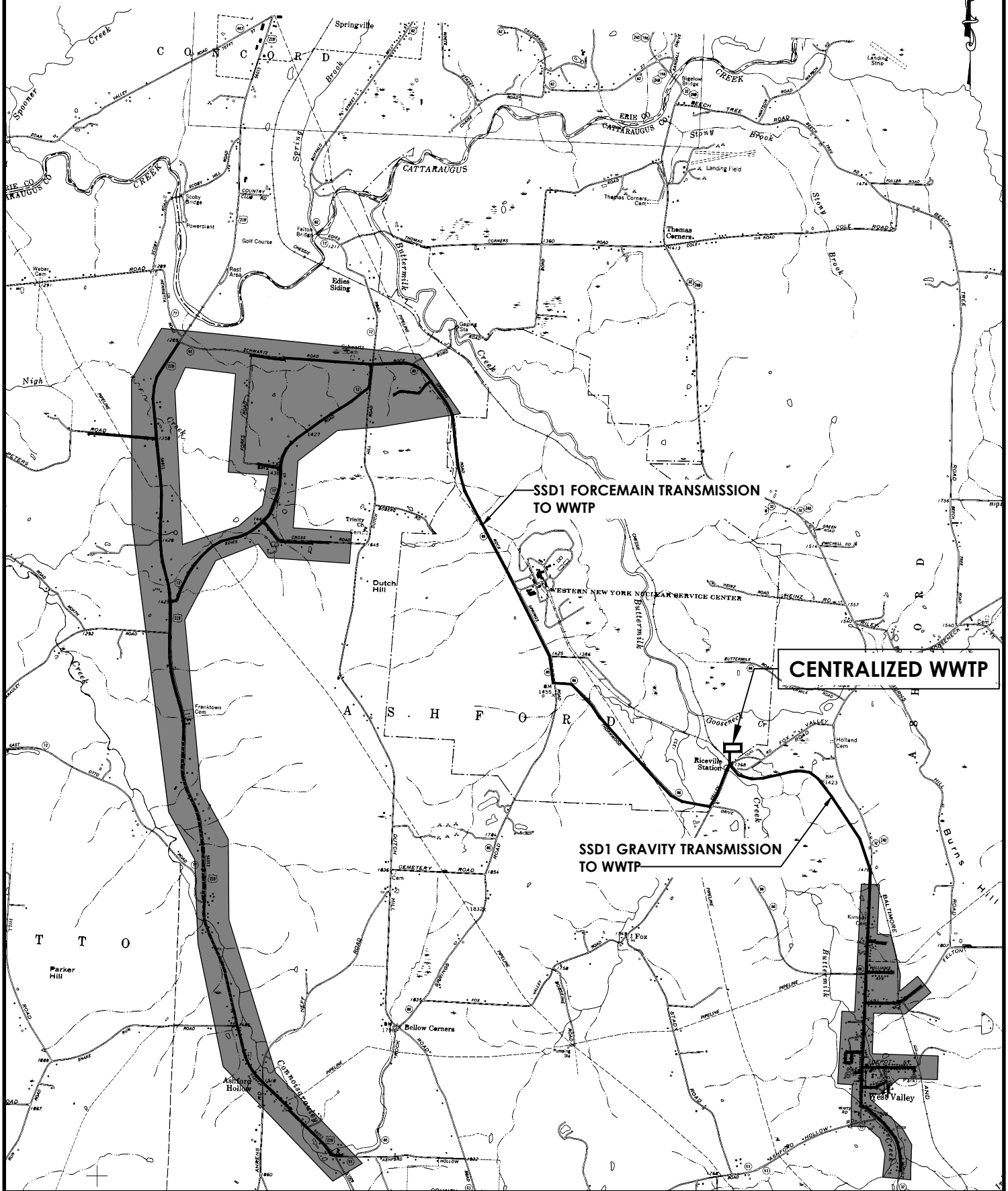

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FIG-06 TREATMENT ALTERNATIVE NO. 3

ASHFORD SEWER DISTRICT 1

ASHFORD, NEW YORK

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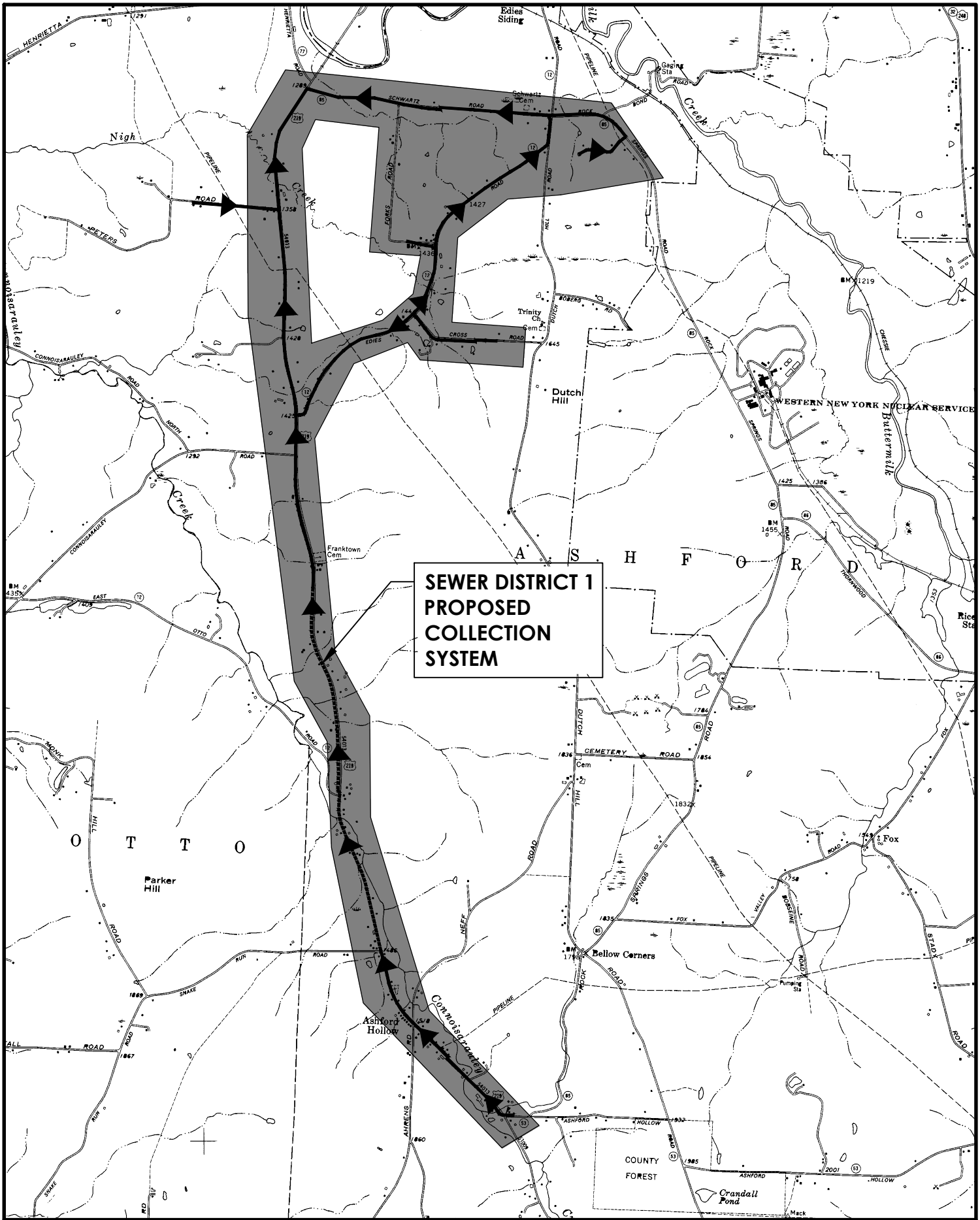

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FIG-07 SSD1 PROPOSED COLLECTION SYSTEM

ASHFORD SEWER DISTRICT 1

ASHFORD, NEW YORK

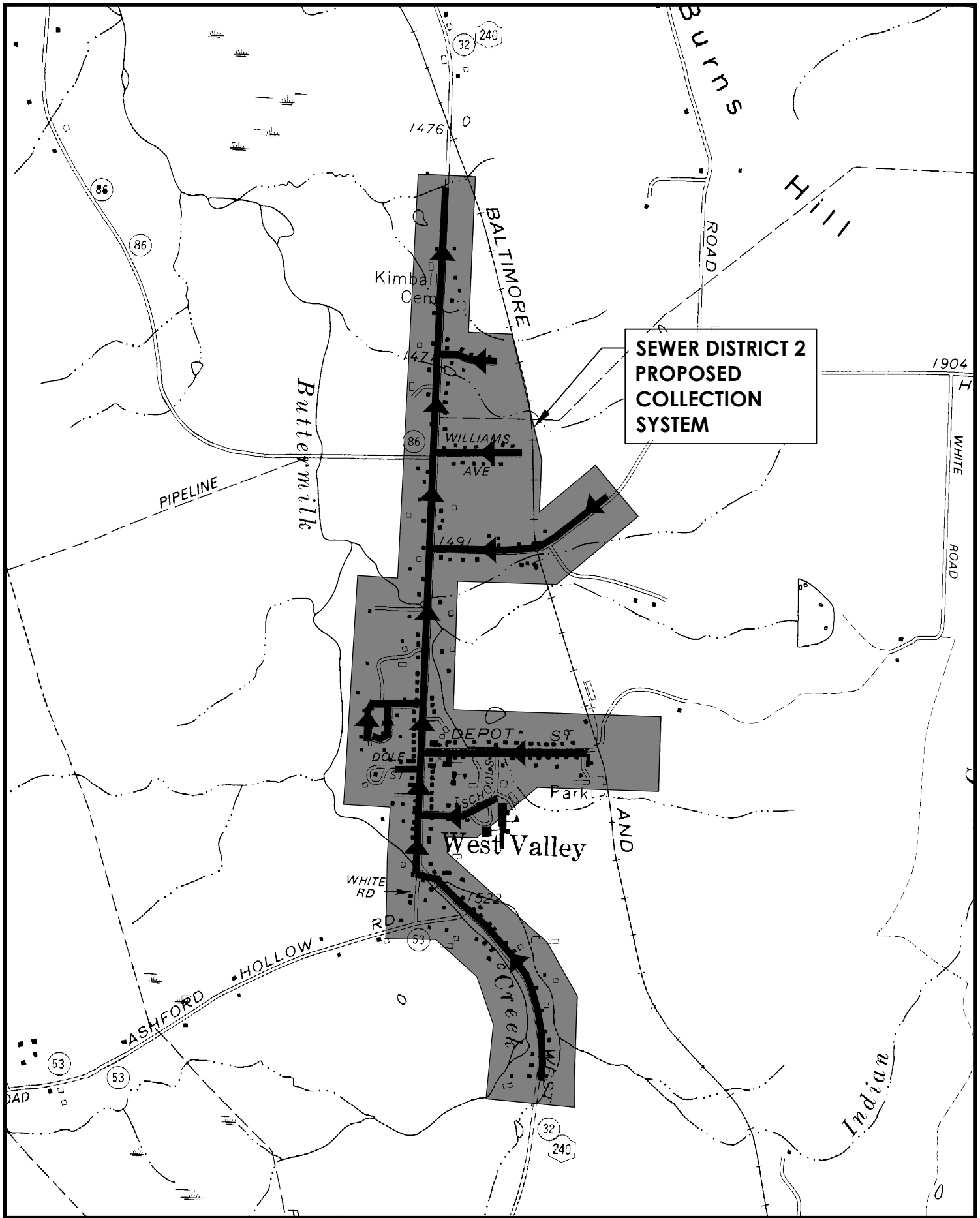

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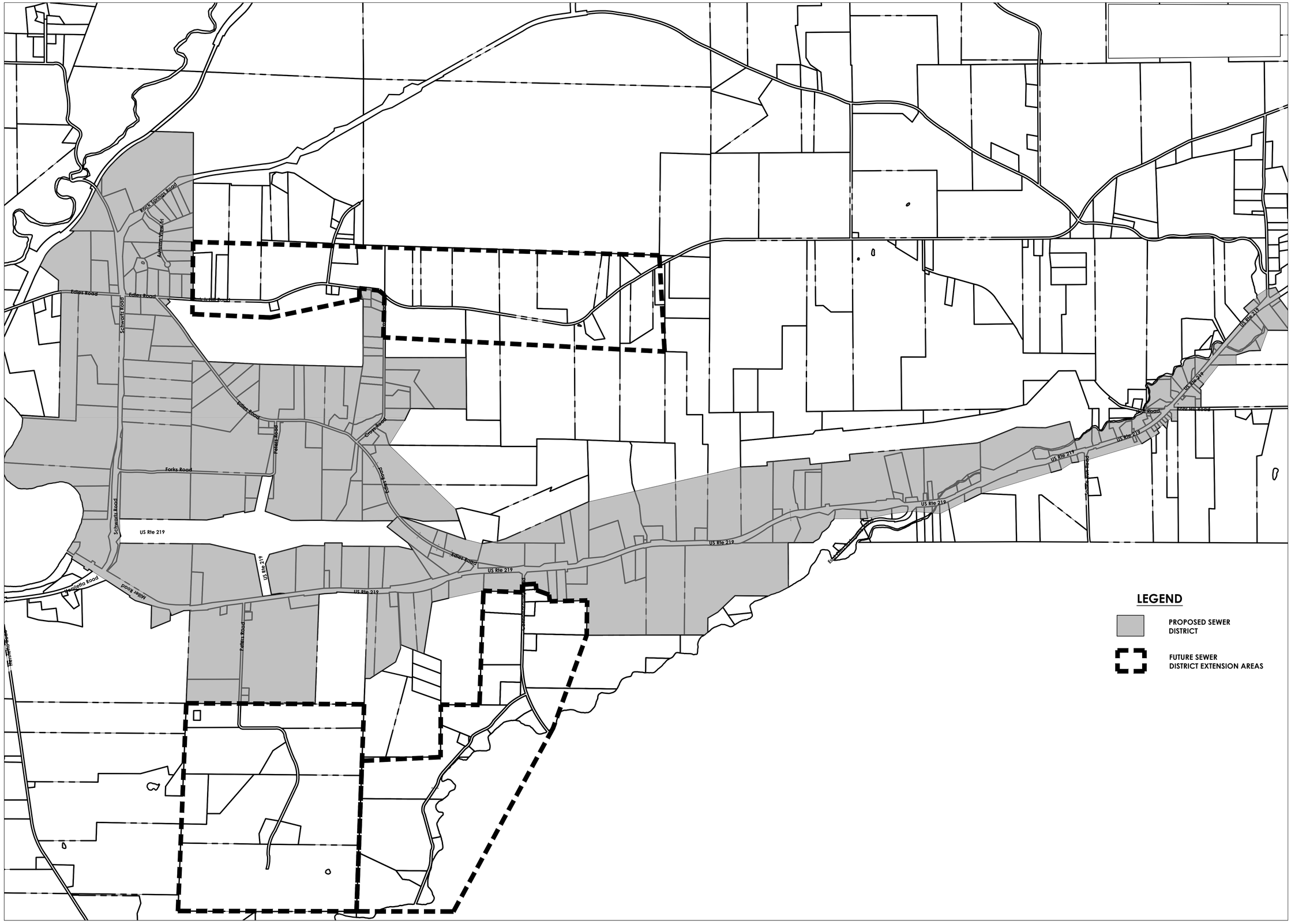
FIG-07 SSD2 PROPOSED COLLECTION SYSTEM

ASHFORD SEWER DISTRICT 2

ASHFORD, NEW YORK



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FUTURE EXTENSION AREAS SSD1

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FIG 08

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Appendix A

Project Area Photographs


Autumn View


DEAD
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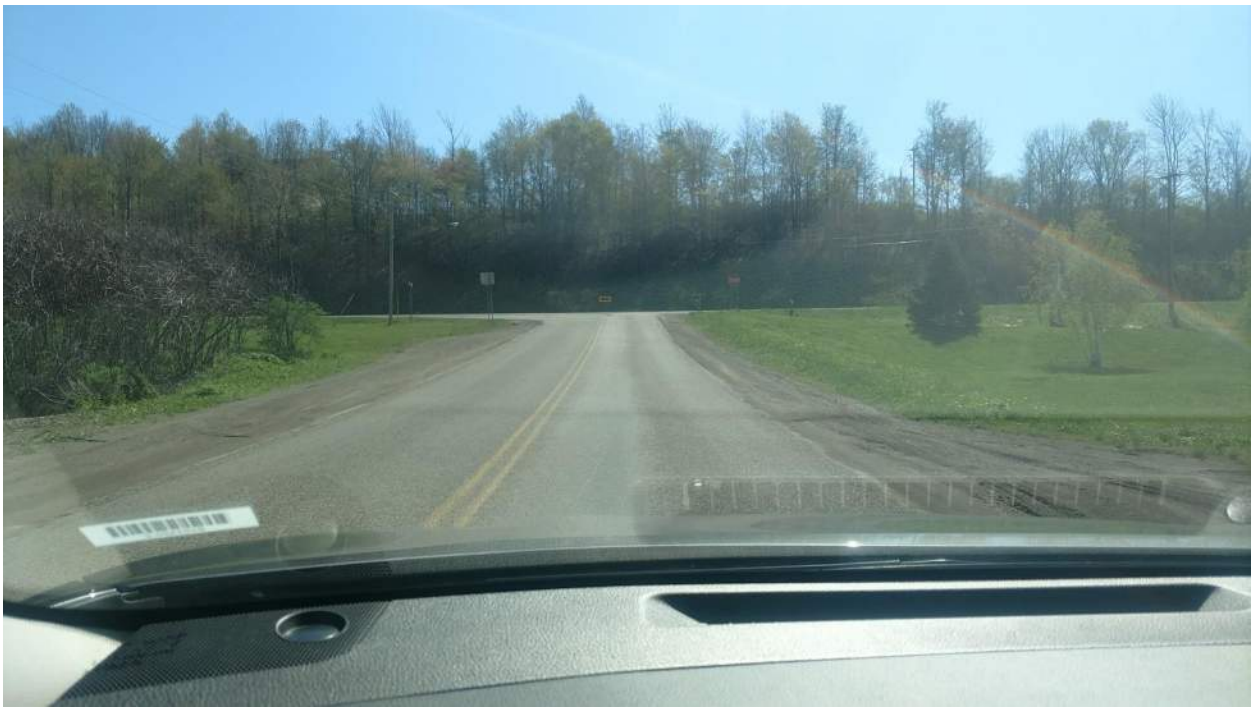
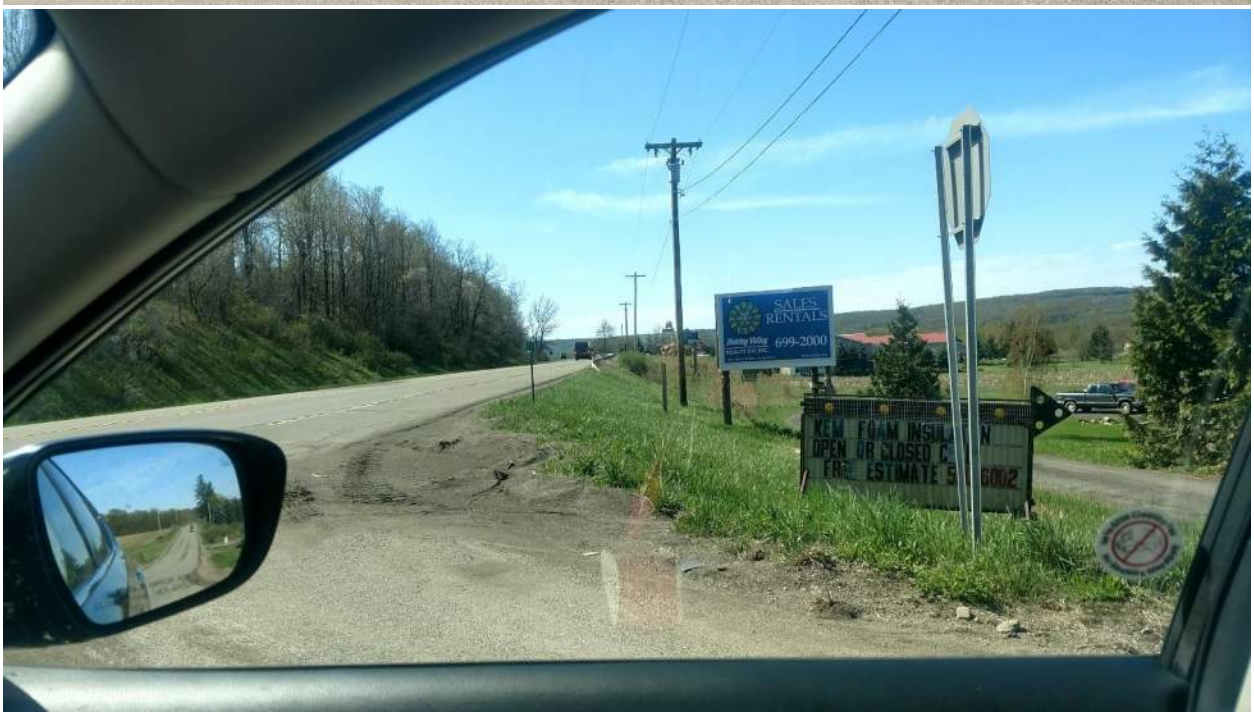



CONNOISARAULEY

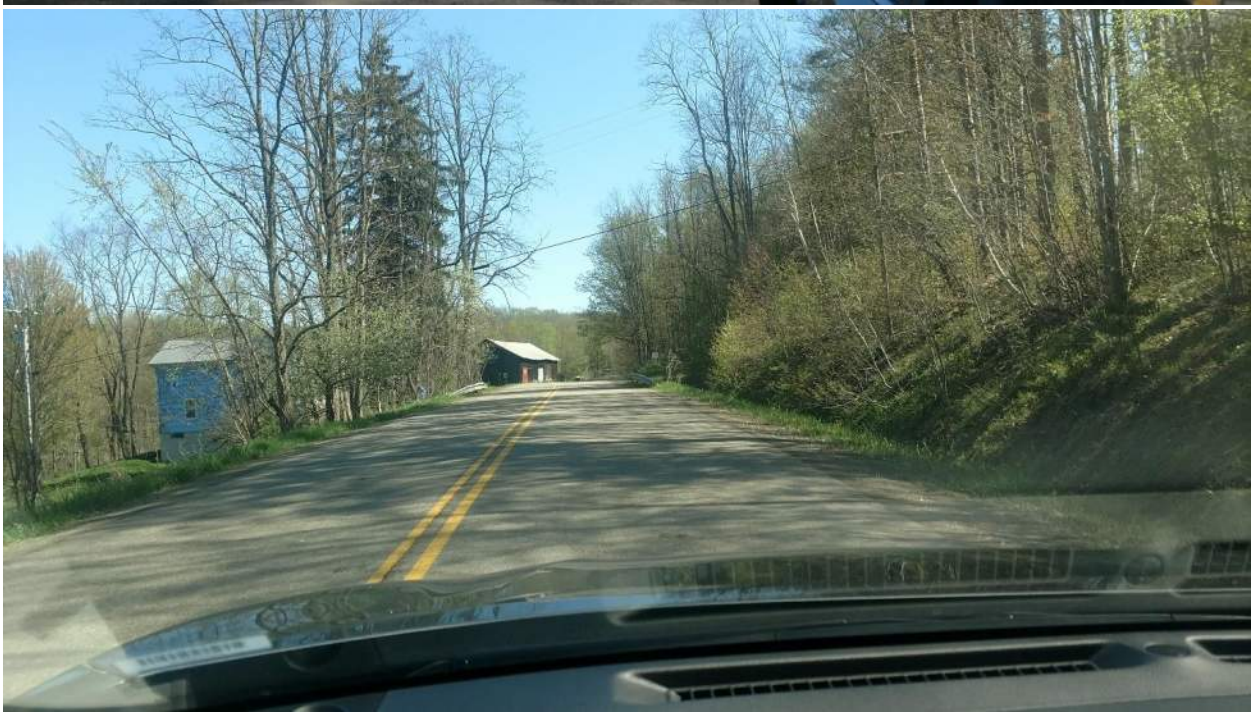

SALES
RENTALS
699-2000


EDIES RD


STOP


Legacy


HOUSE of STEEL
U-HAUL

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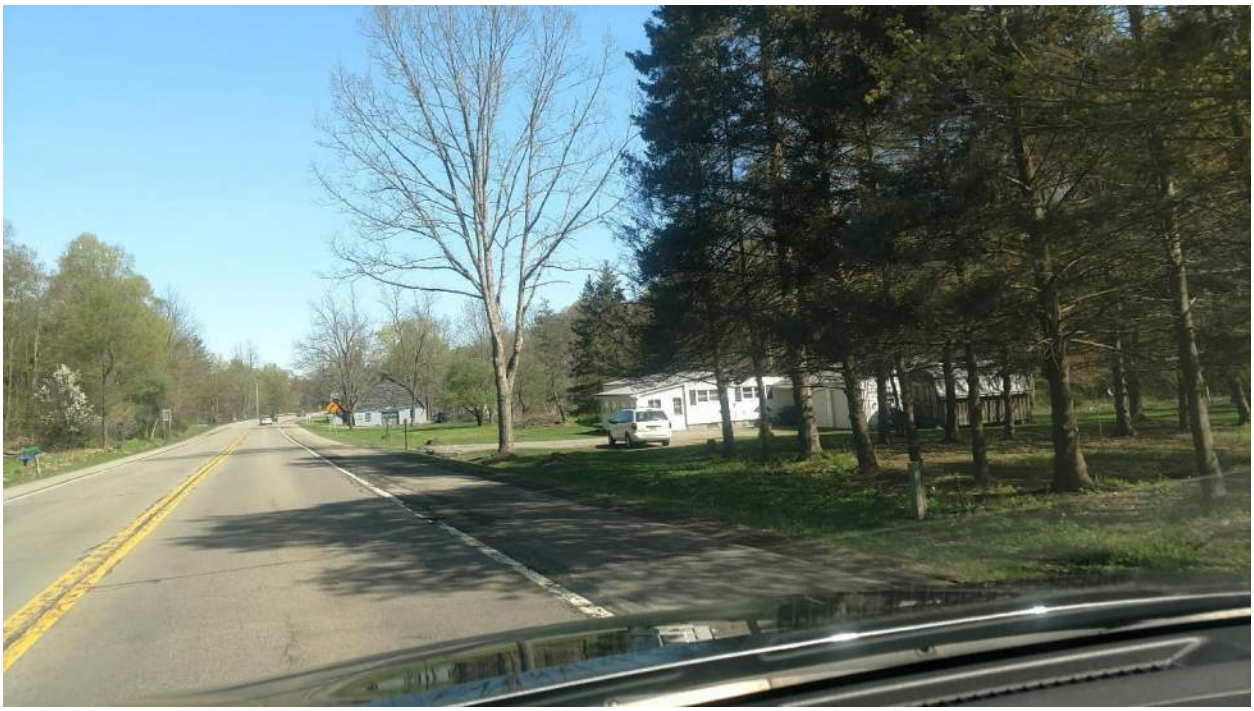
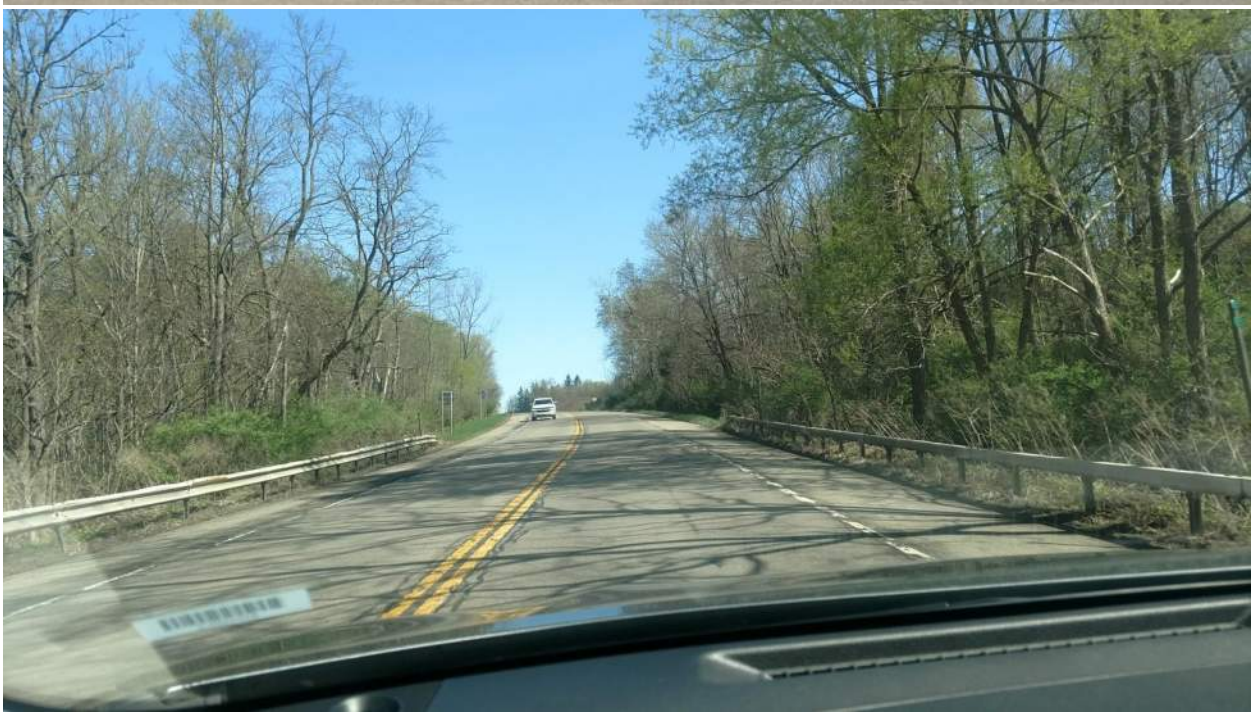


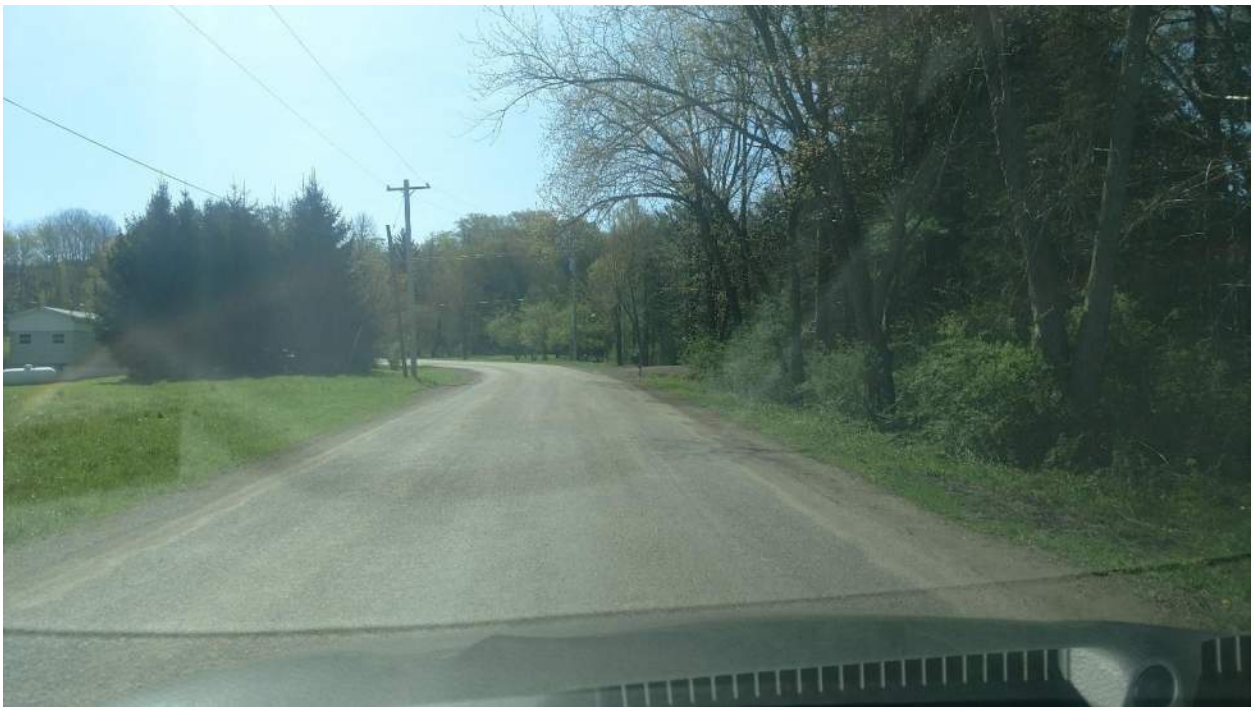


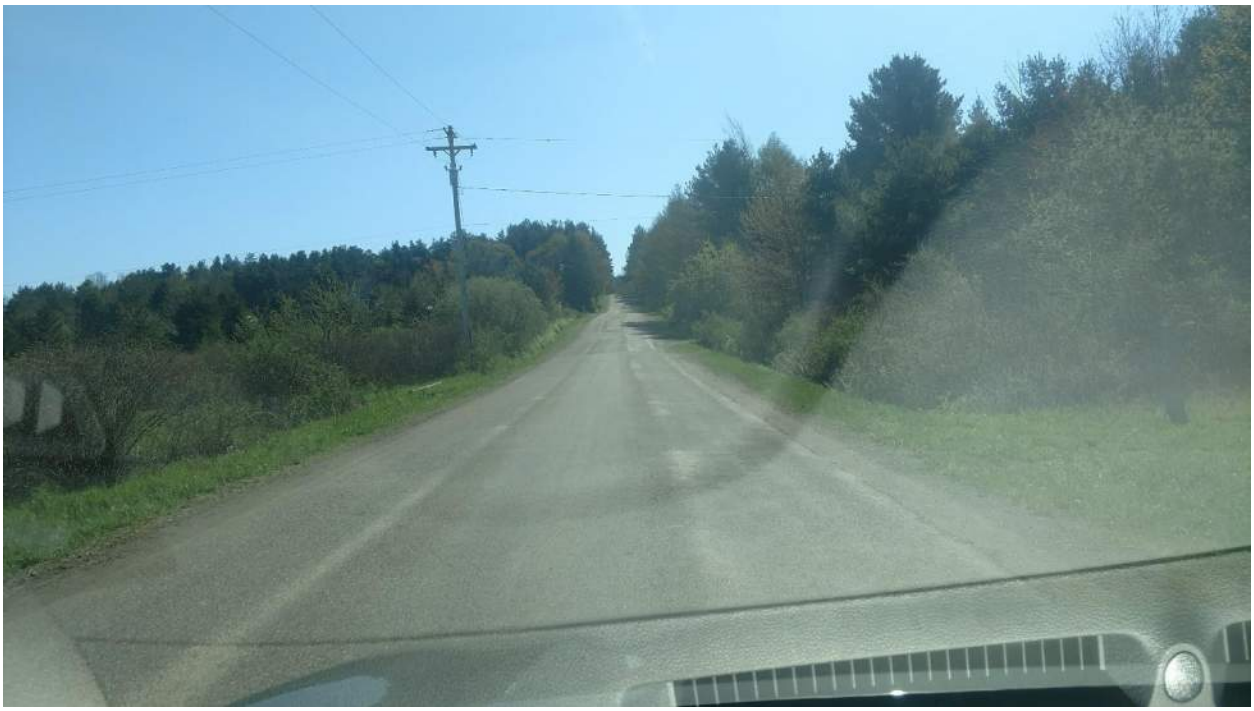

BANK OF
HOLLAND


HOUSE of STEEL


STOP

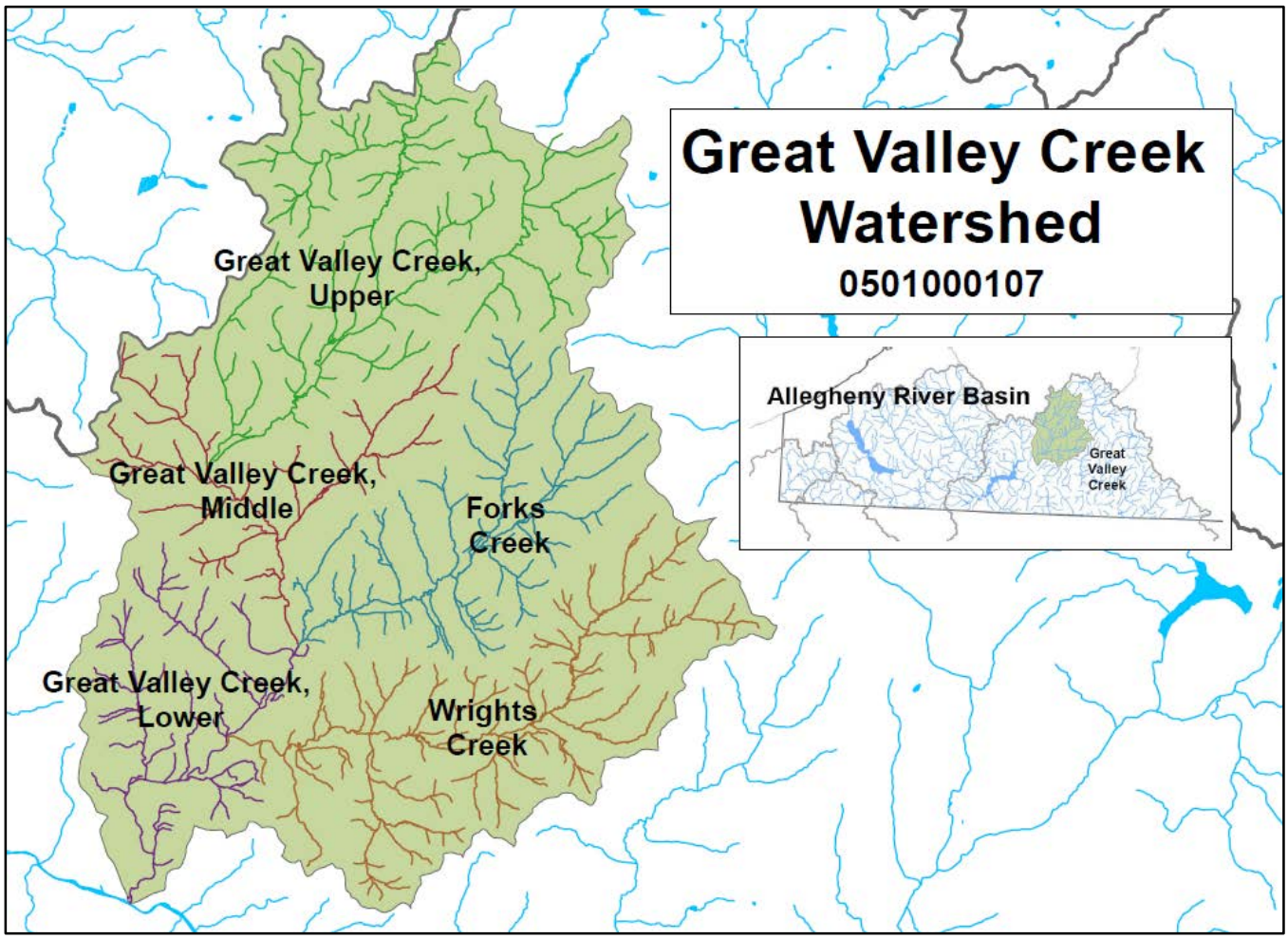

Cross Rd
Except Trucks
28 Feet
And Less





Appendix B

Great Valley Creek Watershed Report



Great Valley Creek Watershed
(0501000107)

Water Index Number	Waterbody Segment	Category
Pa-53-25	Great Valley Cr, Lower, and minor tribs (0201-0039)	Threatened
Pa-53-25	Great Valley Cr, Middle, and minor tribs (0201-0012)	No Known Impacts
Pa-53-25	Great Valley Cr, Upper, and tribs (0201-0040)	No Known Impacts
Pa-53-25- 6	Wrights Creek and tribs (0201-0041)	No Known Impacts
Pa-53-25-11	Forks Creek and tribs (0201-0042)	Threatened

Great Valley Cr, Lower, and minor tribs (0201-0039) Threatened

Waterbody Location Information

Revised: 02/01/2015

Water Index No:	Pa-53-25			**Drain Basin:**	Allegheny River
Unit Code:	0501000107	**Class:**	B		Upper Allegheny
Water Type/Size:	River	50.0 Miles		**Reg/County:**	9/ Cattaraugus Co. (5)
Description:	stream and minor tribs, from mouth to Great Valley				

Water Quality Problem/Issue Information

Uses Evaluated	Severity	Confidence
Water Supply	N/A	-
Public Bathing	N/A	-
Recreation	Fully Supported	Suspected
Aquatic Life	Threatened	Known
Fish Consumption	Fully Supported	Unconfirmed
Conditions Evaluated		
Habitat/Hydrology	Unknown	
Aesthetics	Unknown	

Type of Pollutant(s)

Known:	- - -
Suspected:	UNKNOWN POLLUTANTS (biological impacts)
Unconfirmed:	Silt/Sediment, Nutrients, Pesticides

Source(s) of Pollutant(s)

Known:	- - -
Suspected:	UNKNOWN SOURCE
Unconfirmed:	- - -

Management Information

Management Status:	Verification of Pollutants/Causes Needed
Lead Agency/Office:	DOW/BWAM
IR/305(b) Code:	Water Attaining All Standards (IR Category 1)

Further Details

Overview

This portion of Great Valley Creek is assessed as being threatened due to aquatic life that is thought to be threatened by unspecified pollutants. Biological sampling results show slightly impacted conditions that approach the non-impacted range with minimal anthropogenic impacts and with a community that has some similarity to natural conditions.

Use Assessment

This portion of Great Valley Creek is a Class C(T) waterbody, suitable for general recreation use and support of aquatic life, but not as a water supply or for public bathing. The waterbody is also designated as a cold water (trout) fishery.

Aquatic life is considered to be supported with minimal impacts. Biological sampling of the stream show conditions to be in the slightly impacted range, but approaching non-impacted and with a community that has some similarity to natural conditions. This sampling can also be used to infer that there are no significant impacts to recreational (fishing) uses, although more specific sampling is necessary to confirm this is the case. (DEC, DOW, BWAM, July 2014)

There are no health advisories in place limiting the consumption of fish from this waterbody (beyond the general advice for all waters). Fish consumption is considered to be fully supported based on the absence of any waterbody-specific advisory, but is noted as unconfirmed since routine monitoring of contaminants in fish is limited. (NYS DOH Health Advisories and DEC/DOW, BWAM, January 2014)

Water Quality Information

A biological (macroinvertebrate) assessment of Great Valley Creek in Kill Buck (at Route 417) was conducted as part of the RIBS biological screening effort in 2006. Sampling results reflect good water quality. Conditions were in the slightly impacted range but approaching non-impacted and communities have some similarity to natural conditions. The macroinvertebrate community shows some beginning signs of alteration, some expected sensitive species are not present and overall macroinvertebrate species richness is somewhat lower than expected, but overall there is still balanced distribution of all expected taxa. Aquatic life is fully supported and there are no other apparent water quality impacts. Previous sampling in 2002 and 1996 found non-impacted conditions. (DEC/DOW, BWAM/SBU, January 2015)

NYSDEC Rotating Intensive Basin Studies (RIBS) Intensive Network monitoring of Great Valley Creek in Salamanca/Kill Buck, Cattaraugus County, (at Route 219) was conducted in 2002. Sampling of the water column, sediments, and invertebrate tissues was conducted, as well as macroinvertebrate community analysis. Biological (macroinvertebrate) sampling revealed non–impacted water quality conditions. The fauna was dominated by clean-water mayflies. Water column sampling revealed mercury to be parameter(s) of concern. However, this is based on elevated concentrations in just one of nine samples collected. Toxicity testing of water column, sediment assessment and macroinvertebrate tissue analysis showed no significant impacts. Toxicity testing of sediments indicated some possible impacts. Taken together, these results indicate no significant water quality impacts and uses of the stream are considered to be fully supported. (DEC/DOW, BWAM/RIBS, January 2005)

Source Assessment

Specific sources of pollutants to the waterbody have not been identified. Based on the biologic community composition, silt/sediment, nonpoint nutrients and pesticides are possible pollutants, but the community is als similar to natural conditions. (DEC/DOW, BWAM/SBU, January 2015)

Management Action

No specific management actions have been identified or are deemed necessary for the waterbody.

Section 303(d) Listing

This portion of Great Valley Creek is not included on the current (2014) NYS Section 303(d) List of Impaired/TMDL Waters. There are no impacts/impairments that would justify the listing of this waterbody. (DEC/DOW, BWAM/WQAS, January 2015)

Segment Description

This segment includes the portion of the stream and selected/smaller tribs from the mouth to Forks Creek (-11) near Great Valley. The waters of this portion of the stream are Class C(T). Tribs to this reach/segment, including Hungry Hollow Creek (-3), Mutton Hollow Creek (-8) and Christian Valley Creek (-10), are Class C,C(T). Wrights Creek (-6) and Forks Creek (-11) are listed separately.

Great Valley Cr, Middle, and minor tribs (0201-0012) No Known Impacts

Waterbody Location Information

Revised: 04/01/2016

Water Index No:	Pa-53-25	**Water Class:**	C(T)
Hydro Unit Code:	Great Valley Creek (0501000107)	**Drainage Basin:**	Allegheny River
Water Type/Size:	River/Stream 43.3 Miles	**Reg/County:**	9/Cattaraugus (5)
Description:	stream and tribs, from Great Valley to Ellicottville		

Water Quality Problem/Issue Information

(CAPS indicate MAJOR Pollutants/Sources)

Uses Evaluated	Severity	Confidence
Water Supply	N/A	-
Public Bathing	N/A	-
Recreation	Fully Supported	Suspected
Aquatic Life	Fully Supported	Suspected
Fish Consumption	Fully Supported	Unconfirmed
Conditions Evaluated		
Habitat/Hydrology	Unassessed	
Aesthetics	Unassessed	

Type of Pollutant(s)

Known:	---
Suspected:	---
Unconfirmed:	---

Source(s) of Pollutant(s)

Known:	---
Suspected:	---
Unconfirmed:	---

Management Information

Management Status:	No Action Needed
Lead Agency/Office:	DOW/BWAM
IR/305(b) Code:	Water Attaining All Standards (IR Category 1)

Further Details

Overview

This portion of Great Valley Creek is assessed as having no known impacts; all evaluated uses are considered to be fully supported. Sampling on a trib, Elk Creek (-18), revealed moderate impacts to the biological community. Though non-impacted conditions at three other sites are thought to be more reflective of overall water quality in the segment, follow-up investigation of impacts in Elk Creek are recommended.

Use Assessment

This portion of Great Valley Creek is a Class C(T) waterbody, suitable for general recreation use and support of aquatic life, but not as a water supply or public bathing. The waterbody is also designated as a cold water (trout) fishery.

Aquatic life is considered to be fully supported based on biological sampling that shows non-impacted conditions at two sites on the Creek and at one of two trib sites. This sampling can also be used to infer that there are no significant impacts to recreational (fishing) uses, although more specific sampling is necessary to confirm this is the case. (DEC/DOW, BWAM, December 2014)

There are no health advisories in place limiting the consumption of fish from this waterbody (beyond the general advice for all waters). Fish consumption is considered to be fully supported based on the absence of any waterbody specific advisory, but is noted as unconfirmed since routine monitoring of contaminants in fish is limited. (NYS DOH Health Advisories and DEC/DOW, BWAM, January 2014)

Water Quality Information

Biological (macroinvertebrate) assessments of Great Valley Creek at two sites in Ellicottville (below the WWTP and at Martha Street) were conducted as part of the RIBS biological screening effort in 2011 and 2006. Sampling results indicated non-impacted conditions and very good water quality. Such samples are dominated by clean-water species and are most similar to a natural community with minimal human impacts. Aquatic life community is fully supported. Assessments were also conducted on two tribs. Sampling of Sommerville Creek in Great Valley in 2011 found non-impacted conditions. But sampling of Elk Creek in Ellicottville in 2006 revealed moderately impacted conditions. Though non-impacted conditions at three other sites that were sampled more recently are thought to be more reflective of overall water quality in the segment, follow-up investigation of impacts in Elk Creek are recommended. (DEC/DOW, BWAM/SBU, January 2015)

Source Assessment

Continued expansion and growth of the ski and recreational areas in and around Ellicottville results in a need to increase existing wastewater treatment plant capability. The WWTP permit was revised in 2014 to allow for increased discharge flow but also require more stringent effluent limits. These limits necessitate nitrogen removal in order to meet Class C(T) standards (stream was reclassified from C to C(T) in 1987) and low flow/intermittent stream conditions. Plans for a facility upgrade to meet the revised permit limits have been submitted and are under review. (DEC/DOW, Region 9, February 2015)

Additional residential and commercial development in support of the recreational areas also contributes to stress on the stream. Agricultural and other lands are being converted into ski areas, golf courses, condominiums and commercial businesses. In addition to water quality impacts from stormwater runoff, the impact on changing hydrology and flooding is also a concern. (DEC/DOW, Region 9, February 2015)

Management Actions

No specific management actions have been identified for the overall waterbody. However localized issues regarding an upgrade to the Ellicottville WWTP are being addressed (see Source Assessment). Additional sampling to followup on possible impacts in Elk Creek is also recommended. (DEC/DOW, BWAM, February 2015)

Section 303(d) Listing

This portion of Great Valley Creek is not included on the current (2016) NYS Section 303(d) List of Impaired/TMDL Waters. There are no impacts that would justify the listing of this waterbody. This portion of Great Valley Creek was originally listed in 2014 and was delisted in 2016 due to reassessement indicating uses are fully supporting. (DEC/DOW, BWAM/WQAS, April 2016)

Segment Description

This segment includes the portion of the stream and all tribs from Forks Creek (-11) near Great Valley to/including Elk Creek (-18) in Ellicottville. The waters of this portion of the stream are Class C(T). Tribs to this reach/segment, including Sommerville Valley Creek (-14), Plum Creek (-17) and Elk Creek (-18), are Class C,C(T). Forks Creek (-11) is listed

separately.

Great Valley Cr, Upper, and tribs (0201-0040) No Known Impacts

Waterbody Location Information

Revised: 02/01/2015

Water Index No: Pa-53-25
Unit Code: 0501000107 **Class:** C(T)
Water Type/Size: River 97.2 Miles
Description: stream and tribs, above Ellicottville

Drain Basin: Allegheny River
Upper Allegheny
Reg/County: 9/ Cattaraugus Co. (5)

Water Quality Problem/Issue Information

Uses Evaluated	Severity	Confidence
Water Supply	N/A	-
Public Bathing	N/A	-
Recreation	Fully Supported	Suspected
Aquatic Life	Fully Supported	Known
Fish Consumption	Fully Supported	Unconfirmed
Conditions Evaluated		
Habitat/Hydrology	Unknown	
Aesthetics	Unknown	

Type of Pollutant(s)

Known: - - -
Suspected: - - -
Unconfirmed: - - -

Source(s) of Pollutant(s)

Known: - - -
Suspected: - - -
Unconfirmed: - - -

Management Information

Management Status: Verification of Problem Severity Needed
Lead Agency/Office: DOW/BWAM
IR/305(b) Code: Water Attaining All Standards (IR Category 1)

Further Details

Overview
This portion of Great Valley Creek is assessed as having no known impacts; all evaluated uses are considered to be fully supported. Sampling on a trib, Devereaux Branch (-26), revealed slight impacts to the biological community, but approaching non-impacted conditions.

Use Assessment
This portion of Great Valley Creek is a Class C(T) waterbody, suitable for general recreation use and support of aquatic life, but not as a water supply or public bathing. The waterbody is also designated as a cold water (trout) fishery.

Aquatic life is considered to be fully supported based on biological sampling that shows non-impacted conditions at a site on the Creek; one trib site revealed slight impacts than approached non-impacted conditions. This sampling can also be used to infer that there are no significant impacts to recreational (fishing) uses, although more specific sampling is necessary to confirm this is the case. (DEC/DOW, BWAM, December 2014)

There are no health advisories in place limiting the consumption of fish from this waterbody (beyond the general advice for all waters). Fish consumption is considered to be fully supported based on the absence of any waterbody-specific advisory, but is noted as unconfirmed since routine monitoring of contaminants in fish is limited. (NYS DOH Health Advisories and DEC/DOW, BWAM, January 2014)

Water Quality Information

A biological (macroinvertebrate) assessment of Great Valley Creek in Ellicottville (at Martha Street) was conducted as part of the RIBS biological screening effort in 2011 and 2006. Sampling results indicated non-impacted conditions and very good water quality. Such samples are dominated by clean-water species and are most similar to a natural community with minimal human impacts. Aquatic life community is fully supported. An assessment was also conducted on a trib. Sampling of Devereaux Branch in Cattaraugus 2006 found slight impacts that approached non-impacted conditions and had similarity to natural conditions. (DEC/DOW, BWAM/SBU, January 2015)

Source Assessment

Continued expansion and growth of the ski and recreational areas in and around Ellicottville results in a need to increase existing wastewater treatment plant capability. The WWTP permit was revised in 2014 to allow for increased discharge flow but also require more stringent effluent limits. These limits necessitate nitrogen removal in order to meet Class C(T) standards (stream was reclassified from C to C(T) in 1987) and low flow/intermittent stream conditions. Plans for a facility upgrade to meet the revised permit limits have been submitted and are under review. (DEC/DOW, Region 9, February 2015)

Additional residential and commercial development in support of the recreational areas also contributes to stress on the stream. Agricultural and other lands are being converted into ski areas, golf courses, condominiums and commercial businesses. In addition to water quality impacts from stormwater runoff, the impact on changing hydrology and flooding is also a concern. (DEC/DOW, Region 9, February 2015)

Management Action

No specific management actions have been identified for the overall waterbody. However localized issues regarding an upgrade to the Ellicottville WWTP are being addressed (see Source Assessment). Additional sampling to follow-up on possible impacts in Elk Creek is also recommended. (DEC/DOW, BWAM, February 2015)

Section 303(d) Listing

This portion of Great Valley Creek is not included on the current (2014) NYS Section 303(d) List of Impaired/TMDL Waters. There are no impacts that would justify the listing of this waterbody. (DEC/DOW, BWAM/WQAS, January 2015)

Segment Description

This segment includes the portion of the stream and all tribs above Elk Creek (-18) in Ellicottville. The waters of this portion of the stream are Class C(T). Tribs to this reach/segment, including Bryant Hill Creek (-22), McMurray Creek (-23), Beaver Meadows Creek (-25) and Devereaux Branch (-26), are Class C,C(T).

Wrights Creek and tribs (0201-0041) No Known Impacts

Waterbody Location Information

Revised: 02/01/2015

Water Index No: Pa-53-25- 6
Unit Code: 0501000107 **Class:** C(T)
Water Type/Size: River 96.6 Miles
Description: entire stream and tribs

Drain Basin: Allegheny River
Upper Allegheny
Reg/County: 9/ Cattaraugus Co. (5)

Water Quality Problem/Issue Information

Uses Evaluated	Severity	Confidence
Water Supply	N/A	-
Public Bathing	N/A	-
Recreation	Fully Supported	Suspected
Aquatic Life	Fully Supported	Known
Fish Consumption	Fully Supported	Unconfirmed
Conditions Evaluated		
Habitat/Hydrology	Fair	
Aesthetics	Unknown	

Type of Pollutant(s)

Known:	- - -
Suspected:	- - -
Unconfirmed:	- - -

Source(s) of Pollutant(s)

Known:	- - -
Suspected:	- - -
Unconfirmed:	- - -

Management Information

Management Status: No Action Needed
Lead Agency/Office: ext/WQCC
IR/305(b) Code: Water Attaining All Standards (IR Category 1)

Further Details

Overview
Wrights Creek is assessed as having no known impacts; all evaluated uses are considered to be fully supported.

Use Assessment
Wrights Creek is a Class C(T) waterbody, suitable for general recreation use and support of aquatic life, but not as a water supply or for public bathing. The waterbody is also designated as a cold water (trout) fishery.

Aquatic life is considered to be fully supported based on biological sampling that shows non-impacted conditions. This sampling can also be used to infer that there are no significant impacts to recreational (fishing) uses, although more specific sampling is necessary to confirm this is the case. (DEC/DOW, BWAM/SBU, December 2014)

There are no health advisories in place limiting the consumption of fish from this waterbody (beyond the general advice for all waters). Fish consumption is considered to be fully supported based on the absence of any waterbody-specific advisory, but is noted as unconfirmed since routine monitoring of contaminants in fish is limited. (NYS DOH Health Advisories and DEC/DOW, BWAM, January 2014)

Water Quality Information
A biological (macroinvertebrate) assessment of Wrights Creek in Great Valley (at Route 219) was conducted as part of the RIBS biological screening effort in 2006. Sampling results indicated non-impacted conditions and very good water quality. Such samples are dominated by clean-water species and are most similar to a natural community with minimal human impacts. Aquatic life community is fully supported. An assessment was also conducted on a trib. Sampling of Willoughby Creek in Great Valley in 2011 also found non-impacted conditions most similar to natural communities. (DEC/DOW, BWAM/SBU, January 2015)

Source Assessment
Specific sources of pollutants to waterbody have not been identified.

Management Action
No specific management actions have been identified or are deemed necessary for the waterbody.

Section 303(d) Listing
Wrights Creek is not included on the current (2014) NYS Section 303(d) List of Impaired/TMDL Waters. There are no impacts that would justify the listing of this waterbody. (DEC/DOW, BWAM/WQAS, January 2015)

Segment Description
This segment includes the entire stream and all tribs. The waters of the stream are Class C,C(T). Tribs to this reach/segment, including Barker Run (-1) and Willoughby Creek (-3), are Class C,C(T).

Forks Creek and tribs (0201-0042) Threatened

Waterbody Location Information

Revised: 02/01/2015

Water Index No: Pa-53-25-11
Unit Code: 0501000107 **Class:** C(T)
Water Type/Size: River 71.1 Miles
Description: entire stream and tribs

Drain Basin: Allegheny River
Upper Allegheny
Reg/County: 9/ Cattaraugus Co. (5)

Water Quality Problem/Issue Information

Uses Evaluated	Severity	Confidence
Water Supply	N/A	-
Public Bathing	N/A	-
Recreation	Fully Supported	Suspected
Aquatic Life	Threatened	Known
Fish Consumption	Fully Supported	Unconfirmed
Conditions Evaluated		
Habitat/Hydrology	Unknown	
Aesthetics	Unknown	

Type of Pollutant(s)

Known:	- - -
Suspected:	UNKNOWN POLLUTANTS (biological impacts)
Unconfirmed:	Silt/Sediment

Source(s) of Pollutant(s)

Known:	- - -
Suspected:	UNKNOWN SOURCE
Unconfirmed:	- - -

Management Information

Management Status: Verification of Pollutants/Causes Needed
Lead Agency/Office: DOW/BWAM
IR/305(b) Code: Water Attaining All Standards (IR Category 1)

Further Details

Overview
Forks Creek is assessed as being threatened due to aquatic life that is thought to be threatened by unspecified pollutants. Biological sampling results show slightly impacted conditions that approach the non-impacted range with minimal anthropogenic impacts and with a community that has some similarity to natural conditions.

Use Assessment
Forks Creek is a Class C(T) waterbody, suitable for general recreation use and support of aquatic life, but not as a water supply or for public bathing. The waterbody is also designated as a cold water (trout) fishery.

Aquatic life is considered to be supported with minimal impacts. Biological sampling of the stream show conditions

to be in the slightly impacted range, but approaching non-impacted and with a community that has some similarity to natural conditions. This sampling can also be used to infer that there are no significant impacts to recreational (fishing) uses, although more specific sampling is necessary to confirm this is the case. (DEC, DOW, BWAM, July 2014)

There are no health advisories in place limiting the consumption of fish from this waterbody (beyond the general advice for all waters). Fish consumption is considered to be fully supported based on the absence of any waterbody-specific advisory, but is noted as unconfirmed since routine monitoring of contaminants in fish is limited. (NYS DOH Health Advisories and DEC/DOW, BWAM, January 2014)

Water Quality Information

A biological (macroinvertebrate) assessment of Forks Creek above Great Valley (at Martin Road) was conducted as part of the RIBS biological screening effort in 2006. Sampling results reflect good water quality. Conditions were in the slightly impacted range but approaching non-impacted and communities have some similarity to natural conditions; silt/sedimentation and impoundment effects were also indicated. The macroinvertebrate community shows some beginning signs of alteration, some expected sensitive species are not present and overall macroinvertebrate species richness is somewhat lower than expected, but overall there is still balanced distribution of all expected taxa. Aquatic life is fully supported and there are no other apparent water quality impacts. Previous sampling in 2002 and 1996 found non-impacted conditions. (DEC/DOW, BWAM/SBU, January 2015)

Source Assessment

Specific sources of pollutants to the waterbody have not been identified. Based on the biologic community composition, silt/sediment is a possible pollutant, but the community is also similar to natural conditions and exhibits some impoundment effects. (DEC/DOW, BWAM/SBU, January 2015)

Management Action

No specific management actions have been identified or are deemed necessary for the waterbody.

Section 303(d) Listing

Forks Creek is not included on the current (2014) NYS Section 303(d) List of Impaired/TMDL Waters. There are no impacts/impairments that would justify the listing of this waterbody. (DEC/DOW, BWAM/WQAS, January 2015)

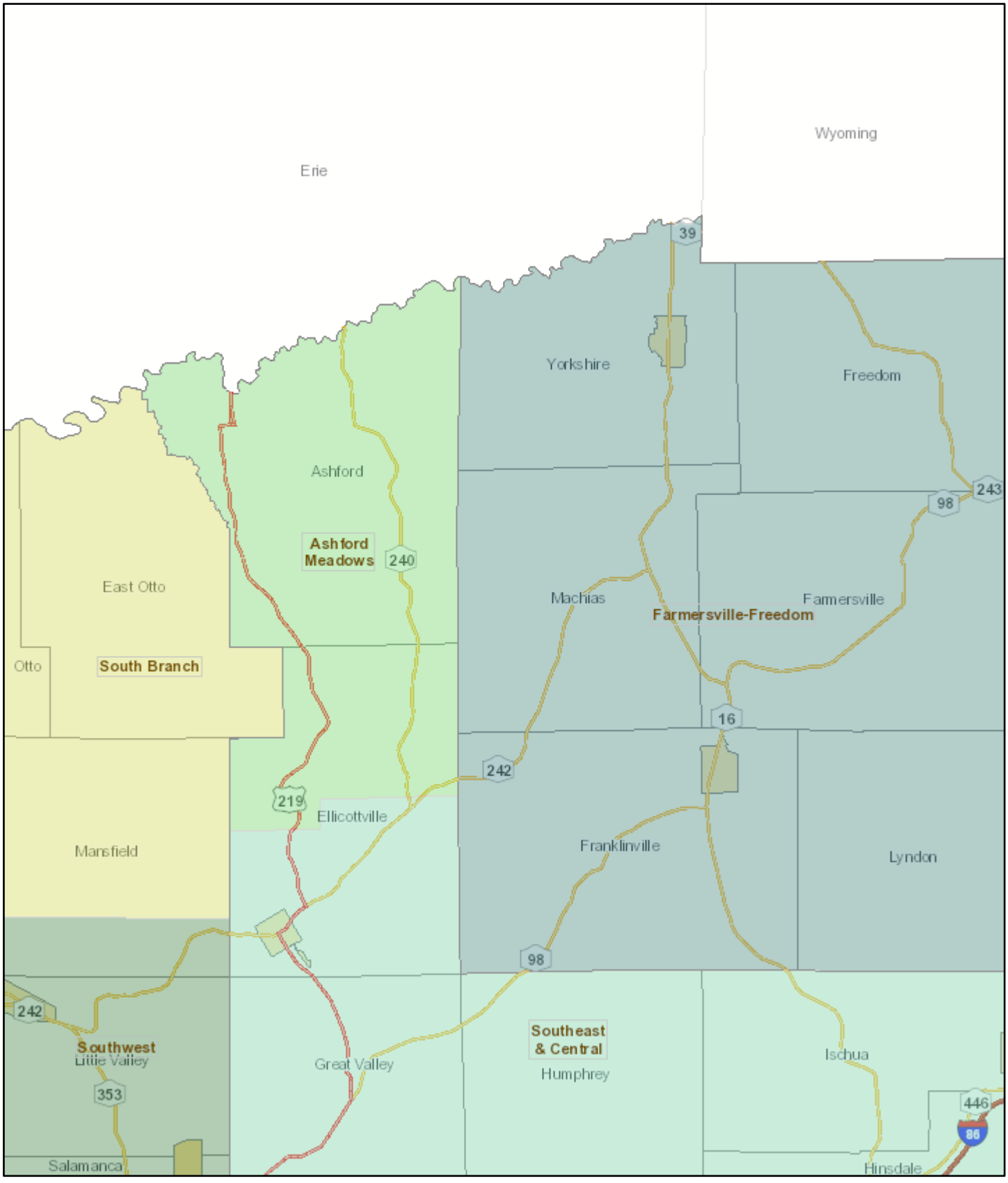
Segment Description

This segment includes the entire stream and all tribs. The waters of the stream are Class C,C(T). Tribs to this reach/segment, including Haines Creek (-3), McGuan Creek (-5), Claire Creek (-7) and Morgan Hollow Creek (-8), are also Class C,C(T).

Appendix C

Environmental Resource Review

Cattaraugus County Agricultural Districts



2/15/2021, 1:41:51 PM

1:288,895

0 1.75 3.5 7 mi

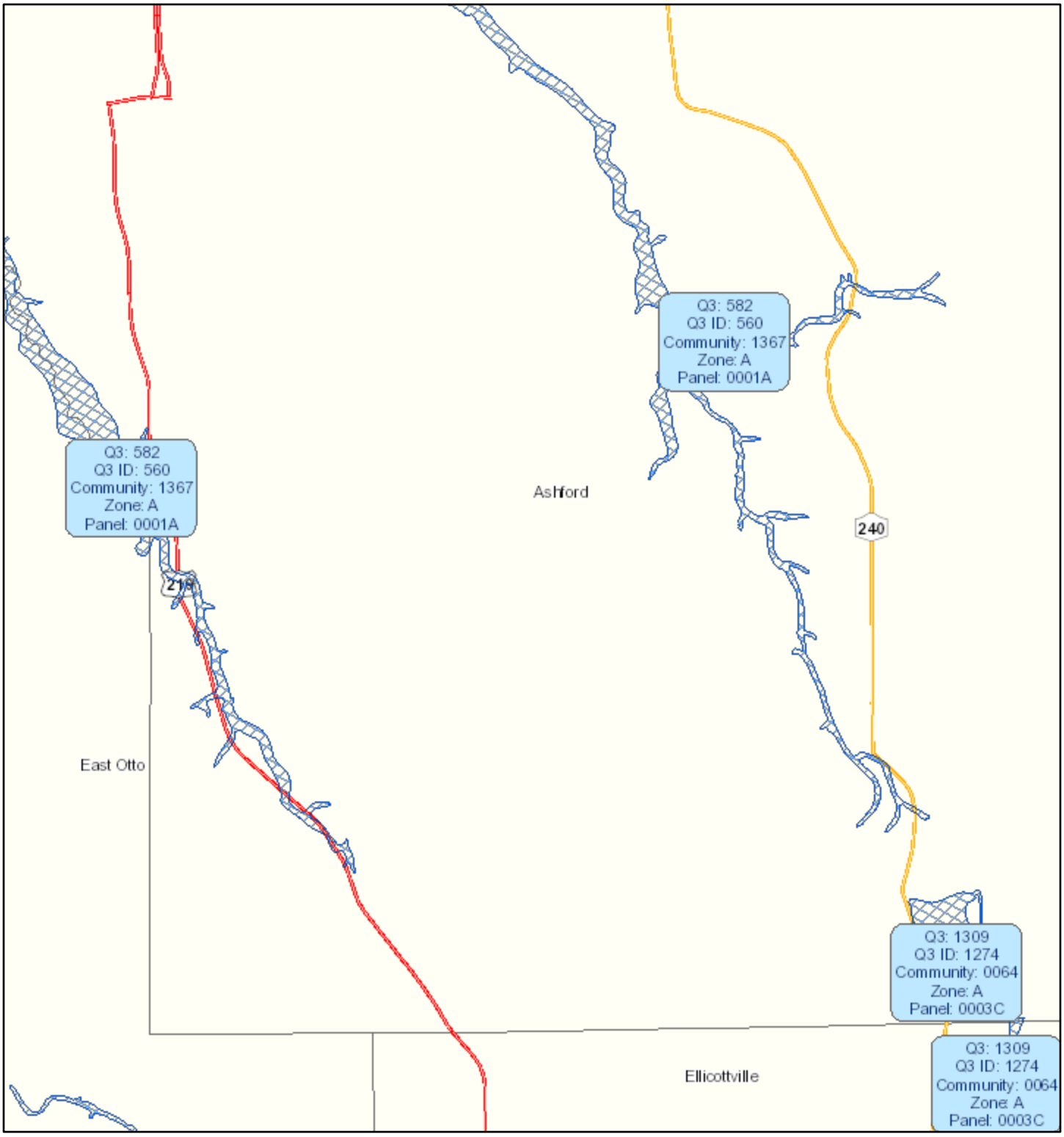
0 2.75 5.5 11 km

Agricultural Districts

- Ashford Meadows
- Farmersville-Freedom
- Northwest
- South Branch
- Southeast & Central
- Southwest

Office of Real Property

100 YR FloodPlain



4/24/2019 8:31:34 AM

1:72,224

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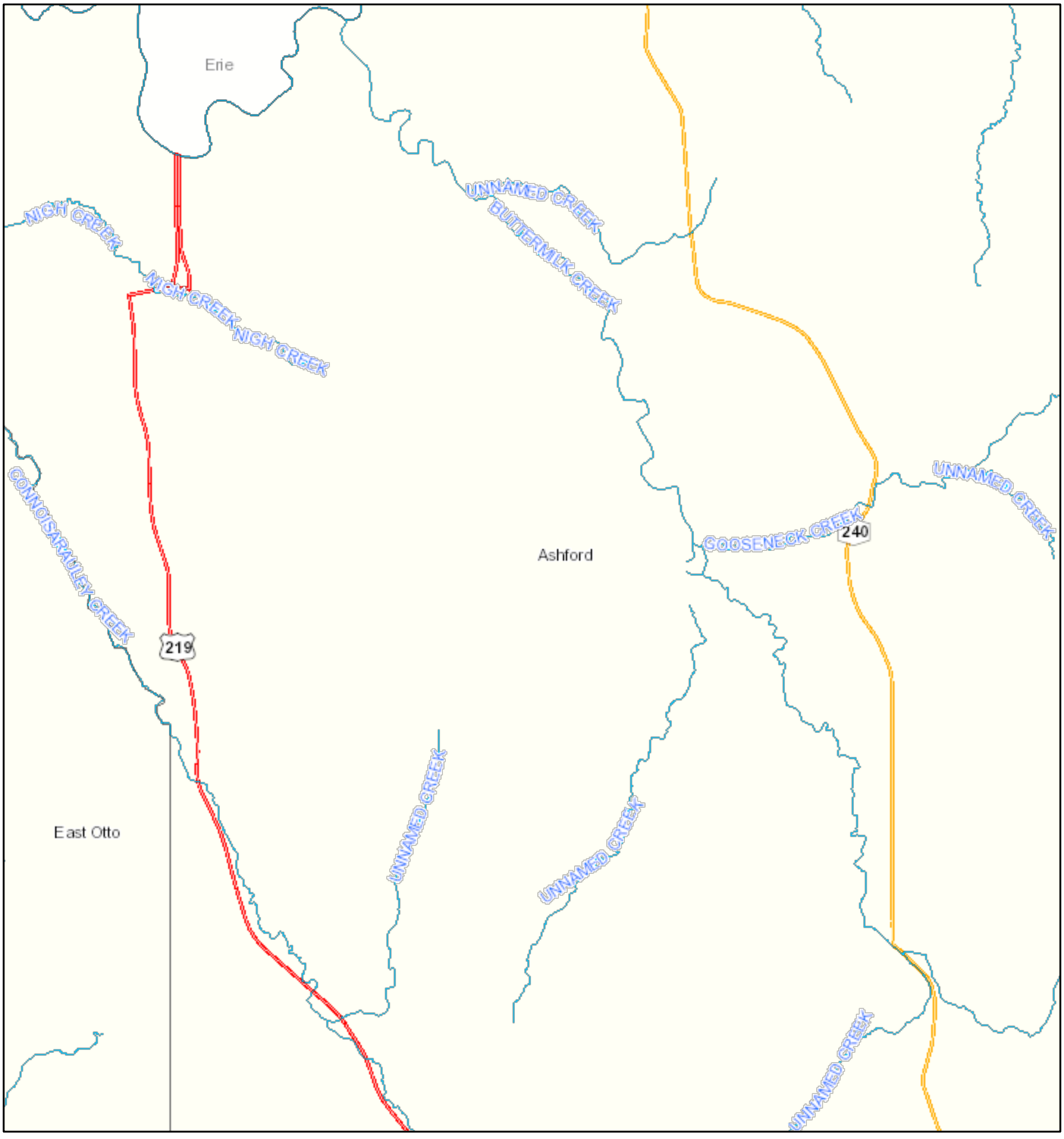
0 0.75 1.5 3 km

Parcel Lines

100yr Floodplain

Ashford Creeks



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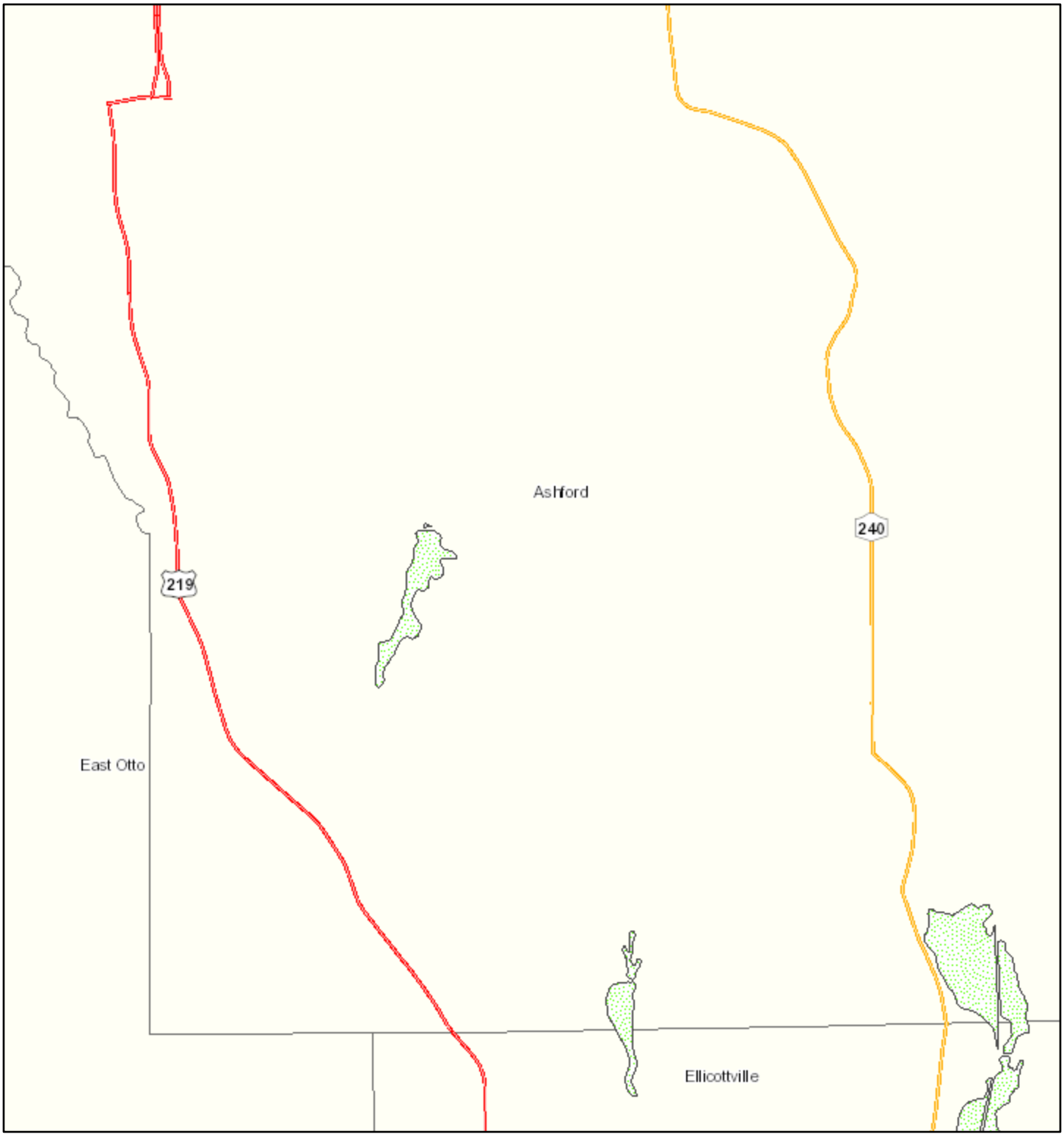
0 0.75 1.5 3 km

Parcel Lines

Streams

Ashford Wetlands (NYSDEC)



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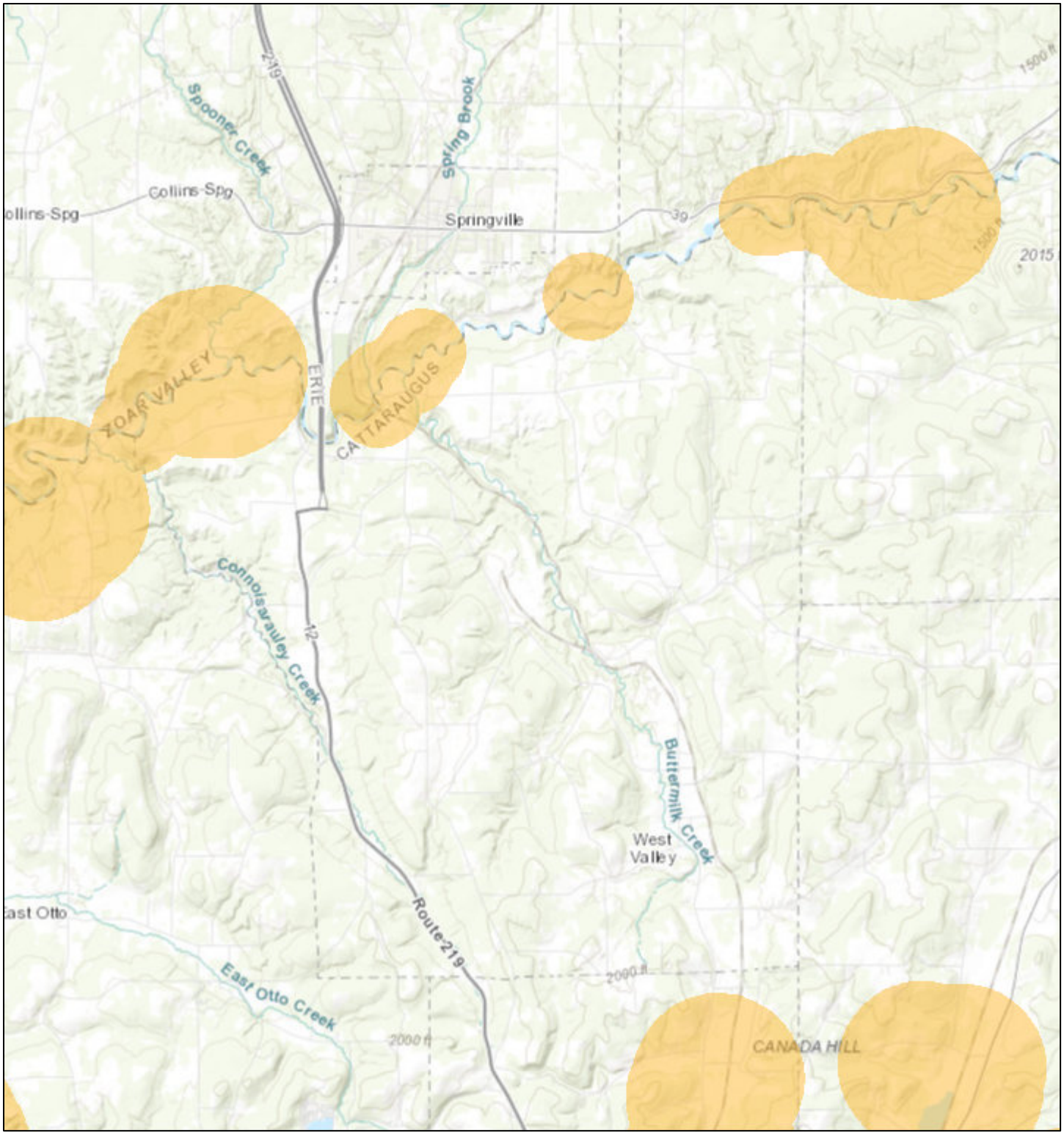
0 0.75 1.5 3 km

Parcel Lines

Wetlands(NYSDEC)

Rare Plants and Animals Map



June 14, 2019

1:144,448

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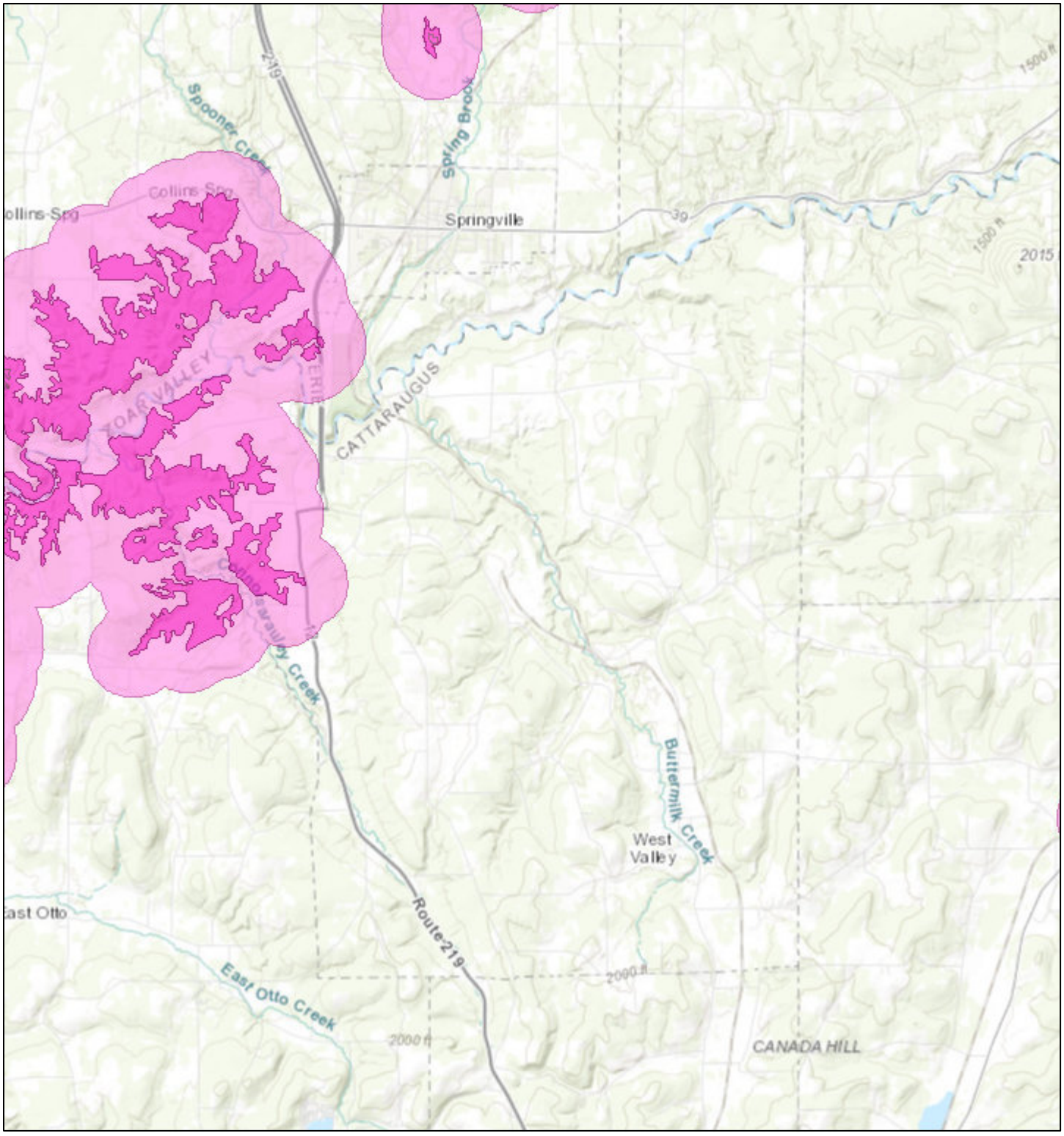
0 2 4 8 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

NYS Department of Environmental Conservation
Not a legal document

Significant Natural Communities



June 14, 2019

1:144,448

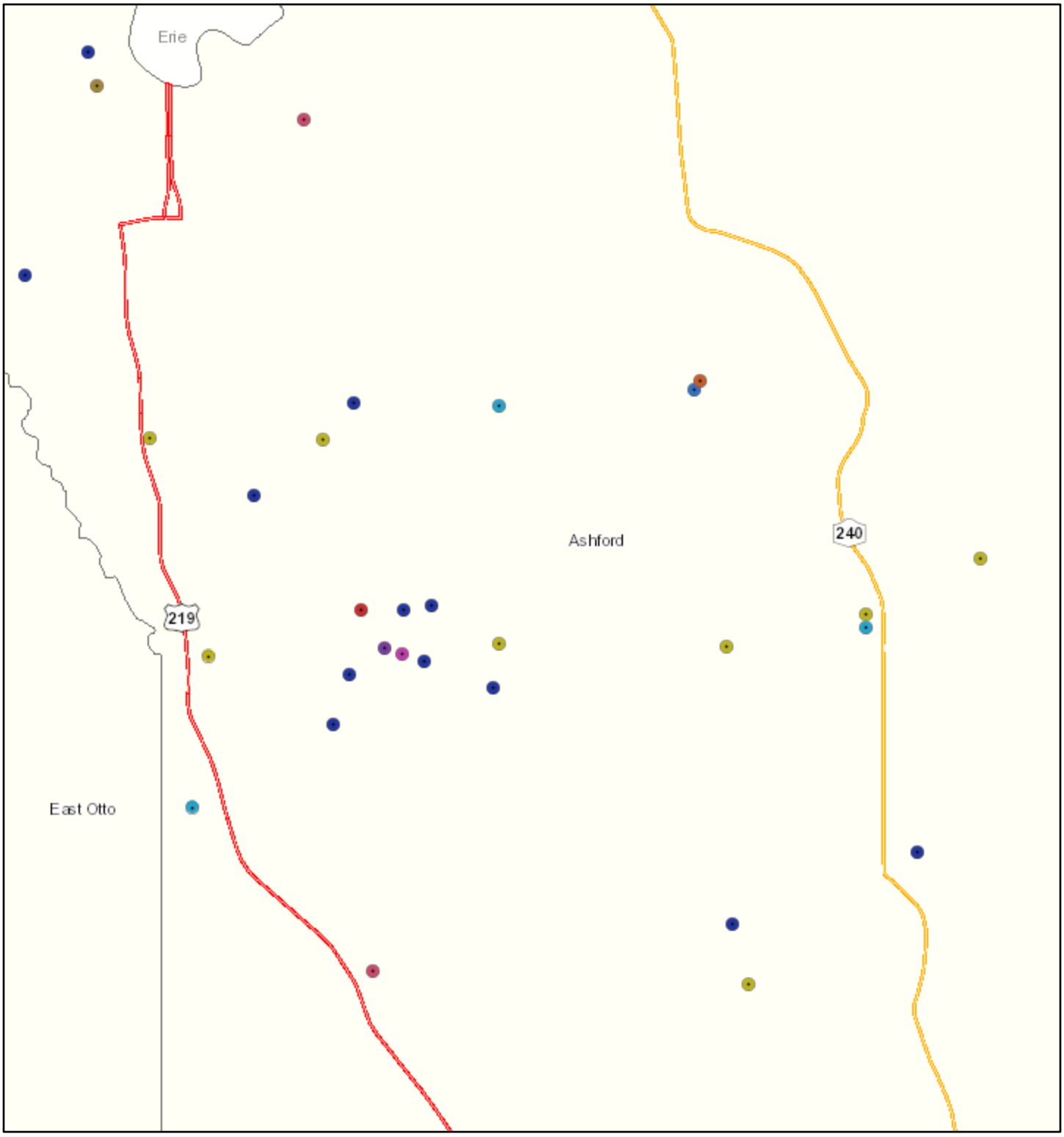
0 1.25 2.5 5 mi

0 2 4 8 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

NYS Department of Environmental Conservation
Not a legal document

Ashford Oil and Gas Wells



4/24/2019 8:35:21 AM

1:72,224

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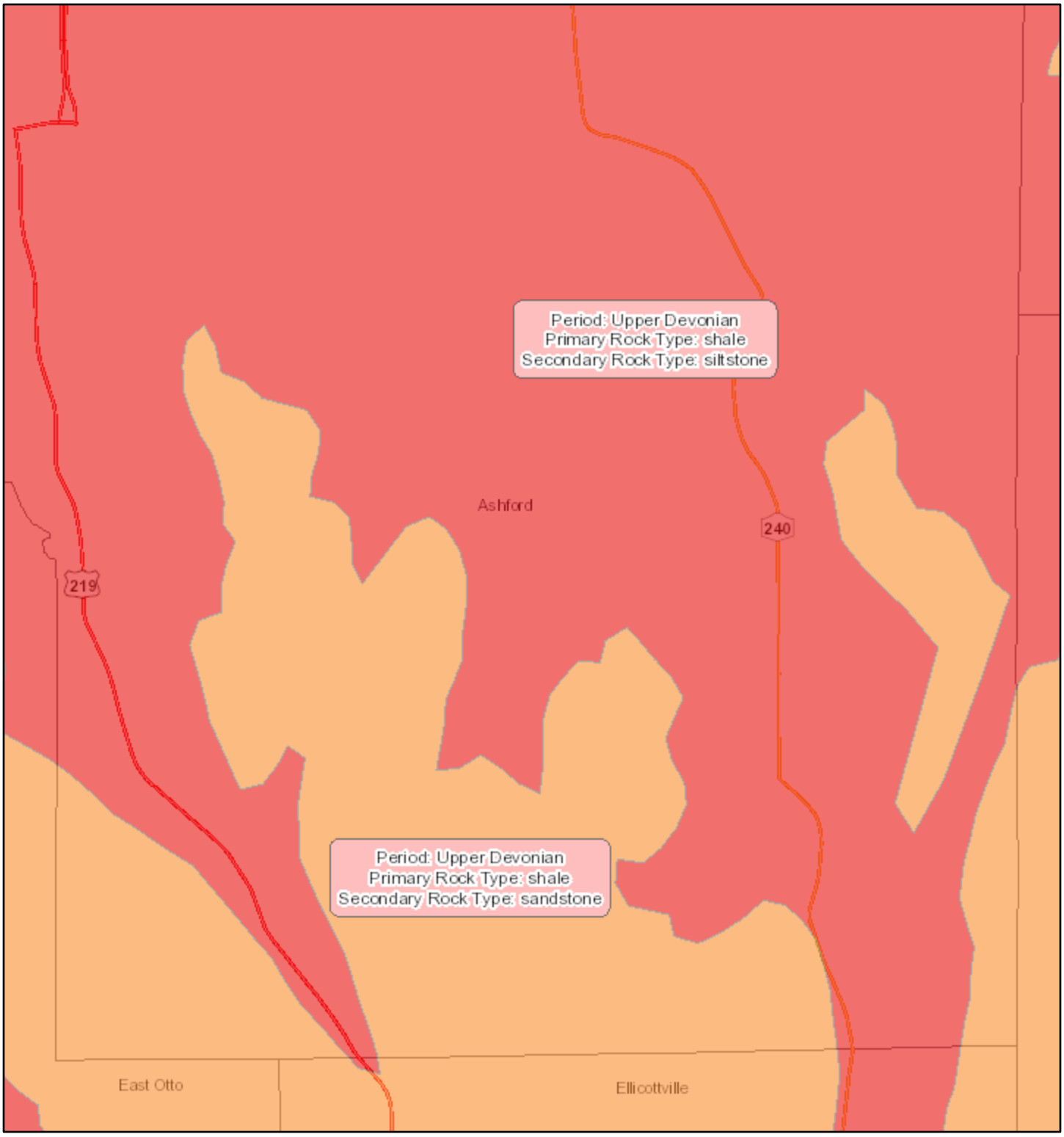
0 0.75 1.5 3 km

Parcel Lines

Oil & Gas Wells

- Confidential
- Dry Hole
- Disposal
- Dry Wildcat
- Gas Development
- Gas Extension
- Gas Wildcat
- Enhanced Oil Recovery - Injection
- Monitoring Miscellaneous
- Monitoring Storage
- Not Listed
- Oil Development
- Oil Extension
- Oil Wildcat

Ashford Bedrock Map



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1:72,224

0 0.45 0.9 1.8 mi

0 0.75 1.5 3 km

Parcel Lines

Bedrock Geology

Sandstone, Black Shale

Sandstone, Shale

Shale

Shale, Sandstone

Shale, Siltstone

water,

Appendix D

Unit Definition and Unit Count

Town of Ashford
Sewer District No. 1
Listing of Properies within proposed project area that will receive sewer service
Last modified: 6/4/2019

Municipality	Property #	Tax Map #	Owner	Location	EDUs	Vacant Developable	Vacant Non-Developable	Description	Notes
				Total EDUs	**205**	**6.8**	**0.29**		
NYS Route 219 South (3)	9831	19.004-1-26.2	Schichtel, James	9831 Rte 219, West Valley	1			Residential, single family	
	9832	19.004-1-25	Klahn, Dolores R	9832 Rte 219, West Valley	1			Residential, single family	
		19.004-1-26.3	Deer, Darwin D	Rte 219	1			Residential, seasonal	
	9850	19.004-1-26.1	Crandall, Bruce R	9850 Rte 219, West Valley	1			Residential, rural	
	9862	19.004-1-27	Crandall, Emilie M	9862 Rte 219	1			Residential, single family	
	9877	19.004-1-28	Sheffield, Karl	9887 Rte 219	1			Residential, single family	
	9886	19.004-1-4.1	Atkinson, Scott W	9886 Rte 219		0.1		Vacant, rural	
	9930	19.004-1-3.1	Klahn, Timothy	9930 Rte 219, West Valley	1			Residential, rural	
	9913	19.004-1-2	Schichtel's Nursery, Inc.	9913 Rte 219	1			Residential, rural	Tree Farm
		19.002-1-33.1	Schichtel's Nursery, Inc.	10008 Rte 219			0.01	Vacant, farmland	
		19.002-1-30	Ploetz, Larry E	Re 219	1			Detached ROW Bldg	Heritage Pipe Organs
		19.002-1-29	Schumacher, Brian L	Rte 219		0.1		Vacant, rural	
		19.002-1-33.4	Frank, Steven E	Rte 219			0.01	Vacant, farmland	
	10008	19.002-1-33.5	Bishop, Ronald	10008 Rte 219	1			Residential, single family	
		19.002-1.31	Frank, Larry A	10038 Rte 219		0.1		Vacant, rural	
		19.002-1-4.12	R & R Holland, LLC	Rte. 219	1			Fuel Store & Dist	ane Supplier, need to estimate
		19.002-1-4.13	Holland, Glenn D	Rte 219			0.01	Vacant, Commercial	corn field
		19.002-1-32	Franktown Cemetery	Rte 219			0.01	Cemetery	
		19.002-1-33.3	Frank, Larry A	10038 Rte 219		0.1		Vacant, rural	
	10038	19.002-1-33.2	Frank, Larry A	10038 Rte 219	1			Residential, mfg housing	
		19.002-1-4.26	Walter, Christopher	Rte 219			0.01	Vacant, rural	corn field
	10091	19.002-1-4.10	Luvender, William P Joyce	10091 Rte 219	1			Residential, single family	
		19.002-1-4.25	Lindstrom, Kenneth	Rte 219		0.1		Vacant, rural	
	10100	19.002-1-4.1	William J Heim Revocable Trust	10100 Rte 219	1			Residential, single family	
		19.002-1-4.9	William J Heim Revocable Trust	10190 Rte 219	1			Residential, rural	
		19.002-1-4.14	Campanella, Dean	Rte 219		0.1		Commercial Storage	
		19.002-1-4.16	Boccolucci, Paul	10155 Rte 219	1			Detached ROW Bldg	Real Stuff Gallery
		19.002-1-4.15	Campanella, Dean	Rte 219	1			Residential, single family	
		19.001-2-21.3	William J Heim Revocable Trust	Rte 219		0.1		Commercial Storage	
Connoisarauley Rd. to 219 South (4)		19.001-2-34.2	Sexton, Leroy B	N Connoisarauley Road	1			Residential, seasonal	
		19.001-2-34.1	Burton, Michael F	N Connoisarauley Road		0.1		Vacant, rural	
		19.001-2-33	Hanny, Russell	N Connoisarauley Road	1			Residential, seasonal	
		19.001-2-36.1	Willam J Heim Revocable, Trust I	N Connoisarauley Road		0.1		Vacant, rural	
		19.001-2-36.2	Willam J Heim Revocable, Tr	N Connoisarauley Road		0.1		Vacant, rural	
		19.001-2-32	Raynor, Linda	N Connoisarauley Road	1			Residential, seasonal	
		19.001-2-31.1	Raynor, John	N Connoisarauley Road	1			Residential, seasonal	
	10253	19.001-2-26	Barrows, Christopher	10253 N Connoisarauley Road	1			Residential, single family	
	10244	19.001-2-27	Woroniecki, David E	10244 N Connoisarauley Road	1			Residential, seasonal	
		19.001-2-25.3	Woroniecki, David	N Connoisarauley Road		0.1		Vacant, rural	
	10320	19.001-2-25.2	McNulty, Patrick M	10320 N Connoisarauley Road	1			Residential, single family	
		19.001-2-28	McCarthy, John P	N Connoisarauley Road		0.1		Vacant, rural	
	7190	19.001-2-25.5	Domon, Donald D	7190 N Connoisarauley Road	1			Residential, single family	
	10210	19.001-2-21.2	King, Alan P	10210 N Connoisarauley Road	1			Residential, single family	
		19.001-2-25.4	King, Alan P	N Connoisarauley Road		0.1		Vacant, rural	
		19.001-2-25.1	Willam J Heim Revocable Trust	Connoisarauley Road		0.1		Vacant, rural	
		19.001-2-24	Decourcey, Robert J	Connoisarauley Road		0.1		Vacant, rural	
	7119	19.001-2-21.11	Thomas, James M	7119 Connoisarauley Road	1			Residential, rural	
	7140	19.001-2-21.4	McCarthy, John P	7140 Connoisarauley Road	2			Residential, rural	potentially 2 houses on lot
		19.001-2-21.8	McCarthy, John P	Connoisarauley Road	1			Residential, seasonal	
		19.001-2-21.5	Tomczyk, Barbara	Connoisarauley Road	1			Residential, single family	
		19.001-2-21.10	William J Heim Revocable Trust	Connoisarauley Road		0.1		Vacant, rural	
	7071	19.001-2-21.9	William J Heim Revocable Trust	7071 Connoisarauley Road	2			Residential, 2 family	
		19.001-2-21.1	William J Heim Revocable Trust	Connoisarauley Road			0.01	Vacant farmland	corn field
		19.002-1-4.11	William J Heim Revocable Trust	Connoisarauley Road	1			Apartment	
		19.002-1-4.17	Campanella, Dean	Connoisarauley Road		0.1		Vacant, rural	
	7048	19.001-2-21.6	Heim, William J	7048 Connoisarauley Road	1			Residential, single family	
		19.001-2-21.3	William J Heim Revocable Trust	Rte 219			0.01	Commercial Storage	
	10303	19.002-1-4.6	William J Heim Revocable Trust	10303 Edies Road & Rte 219		0.1		Single-use small bldg	use unknown
	10221	19.002-1-1	Klahn, Ronald R	10221 Edies Road	2			Residential, multiple	
	10261	19.002-1-2	Burch, Kimberly	10261 Edies Road	1			Residential, single family	
		19.002-1.3	Burch, Kimberly	10261 Edies Road	1			Vacant with improvements	ho. on prop.&Mfg in woods
		19.002-1-4.2	Mathews, Warren P	Edies Road		0.1		Vacant	abandoned agricultural field
		19.002-1-4.27	Sincon Realty, LI	Edies Road			0.01	Vacant farmland	
		19.002-1-5	Mathews, Warren P	Edies Road	1			Residential, seasonal	possible structure, no dvwy
	10380	19.002-1-6.1	Turner, Richard D	10380 Edies Road	1			Residential, rural	
	10402	19.002-1-6.2	Howe, Richard	10402 Edies Road	1			Residential, mfg housing	
	10421	10.004-1-47.3	Blasz, Jody M	10421 Edies Road	1			Residential, single family	
		10.004-1-47.1	Dignigied Group Services	Edies Road		0.1		Vacant, rural	
	6779	19.002-1-7.1	Lockard, Marlene D	6779 Cross Road	1			Residential, single family	
	6761	19.002-1-13.2	Campanella, Dean	6761 Cross Road	1			Residential, mfg housing	
	6769	19.002-1-7.2	Campanella, Dean	6769 Cross Road	1			Residential, mfg housing	
	6761	19.002-1-8	Campanella, Dean	6761 Cross Road	1			Residential, rural	
	6747	19.002-1-9	Sabad, Erich	6747 Cross Road	1			Residential, single family	
		19.002-1-10	Sabad, Erich	6747 Cross Road		0.1		Vacant, rural	
	6697	19.002-1-11	Quick, Richard A	6697 Cross Road	1			Residential, single family	
		19.002-1-13.1	Hallett, James S	6688 Cross Road		0.1		Vacant, rural	
	6712	19.002-1-13.4	Hallett, James S	6712 Cross Road	1			Residential, mfg housing	
	6688	19.002-1-13.5	Hallett, James S	6688 Cross Road	1			Residential, single family	
	6693	19.002-1-12.2	Butticci, Ann M	6693 Cross Road	1			Residential, single family	
		19.002-1-12.1	Cruz, Fundador Jr	6693 Cross Road		0.1		Vacant, rural	location is mailing address
		19.002-1-13.3	Hallett, James S	6688 Cross Road		0.1		Vacant, rural	
	6662	19.002-1-14	Addison, William M	6662 Cross Road	1			Residential, single family	
		19.002-1-12.3	James, Garrick A	Dutch Hill		0.1		Vacant, rural	
	6642	19.002-1-15.1	Kent, Ronald E Jr	6642 Cross Road	1			Residential, single family	
	6614	19.002-1-15.2	Nagel, William G	6614 Cross Road	1			Residential, mfg housing	
	10351	19.002-1-17	Harshbarger, Estate of Michelle	10351 Dutch Hill Road	1			Residential, single family	
	10451	10.004-1-46	Lamphier, Mary Ellen	10451 Edies Road	1			Residential, rural	Yes
	10438	10.004-1-45	Kasper, Stanley W	10438 Edies Road	1			Residential, single family	Yes
	10466	10.004-1-44.2	Ryan, Sean	10466 Edies Road	1			Residential, rural	

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Municipality	Property #	Tax Map #	Owner	Location	EDUs	Vacant Developable	Vacant Non-Developable	Description	Notes
Edies Road to Route 219 South (2)		10.004-1-44.1	Zosh, Cara N	Edies Road	1			Residential, seasonal	
		10.004-1-48.1	Jurus, Walter	Edies Road	1			Residential, mfg housing	
		10.004-1-43	Schmelzinger, Scott W	Edies Road		0.1		Vacant, rural	
	6827	10.004-1-48.4	Noto, Mark P	6827 Peters Road	1			Residential, rural	
	10512	10.004-1-42	Ott-Vedder, Geraldine	10512 Edies Road	1			Residential, single family	
	10584	10.004-1-38.1	Kupka, Jay J	10584 Edies Road	1			Residential, rural	
	6808	10.004-1-40	Vacinek, Donna	6808 Peters Road	1			Residential, single family	
	10559	10.004-1-39.1	Lynch, James F	10559 Edies Road	1			Residential, single family	
	10588	10.004-1-37	Mortimer, Mark	10588 Edies Road	1			Residential, single family	
	10600	10.004-1-36	Lee, John P.	10600 Edies Road	1			Residential, single family	
	10585	10.004-1-33	Soboleski, Richard J.	10585 Edies Road	1			Multi-purpose structure	check use
		10.004-1-38.2	Miller, Willard W.	Peters Road		0.1		Vacant, rural	
	10614	10.004-1-35	Hettrich, Jeanne E.	10614 Edies Road	1			Residential, single family	
	10624	10.004-1-34	Franklin, Mark A.	10624 Edies Road	1			Residential, single family	
	10619	10.004-1-32	Sion, John B.	10619 Edies Road	1			Residential, single family	
	10639	10.004-1-31	Dickson, Richard N.	10639 Edies Road	1			Residential, mfg housing	
		10.004-1-29.1	Dickson, Richard N.	Edies Road		0.1		Vacant, separate property	
		10.004-1-29.11	Barney, Paul M.	Edies Road		0.1		Vacant, rural	
	10727	10.004-1-29.7	Gernatt, Kimberly	10727 Edies Road	1			Residential, single family	
	10741	10.004-1-29.4	Gross, Alvin H.	10741 Edies Road	1			Residential, mfg housing	
	6637	10.004-1-29.8	Payne, Gregory	6637 Schwartz Road	1			Residential, single family	
	6657	10.004-1-29.9	Prime, Jack J.	6657 Schwartz Road	1			Residential, rural	
		10.004-1-29.12	Rybak, Charles	Schwartz Road		0.1		Vacant, rural	
	6729	10.004-1-29.3	Fraser, Cameron L.	6729 Schwartz Road	1			Residential, rural	
	6743	10.004-1-29.6	Kucewicz, Sigmund S. Jr	6743 Schwartz Road	1			Residential, rural	
	6763	10.004-1-29.5	Riefler, Elizabeth	6763 Schwartz Road	1			Residential, rural	
	6784	10.004-1-2	Hess, Lawrence C.	6784 Schwartz Road	1			Residential, rural	
	6760	10.004-1-29.13	Riefler, Scott P.	6760 Schwartz Road	1			Residential, rural	
		10.004-1-29.2	Schichtel's Nursery, Inc.,	Schwartz Road and Edies Road			0.01	Vacant farmland	
	6626	10.004-1-7	Wing, Thomas L.	6626 Schwartz Road	1			Residential, single family	
	10767	10.004-1-8	Kelley, Marlene J.	10767 Edies Road	1			Residential, single family	
		10.004-1-6	Felton, Patricia A.	Edies Road			0.01	Vacant farmland	
	10800	10.004-1-76.3	Salt, William J.	10800 Edies Road	1			Residential, single family	
	10770	10.004-1-9	Enser, Jeffrey	10770 Edies Road	1			Residential, single family	
	10708	10.004-1-76.1	Krzemien, Jeremy	10708 Rock Springs Road	1			Residential, rural	
	10676	10.004-1-77.2	Skelton, Bernadette J.	10676 Rock Springs Road	1			Residential, single family	
	10596	10.004-1-77.1	Bishop, Christina	10596 Rock Springs Road	1			Residential, mfg housing	
	10591	10.004-1-65	Bramer, Cynthia	10591 Rock Springs Road	1			Residential, mfg housing	
		10.004-1-66	Krause, Jeremy C.	Rock Springs Road		0.1		Vacant	<10 acres
	10623	10.004-1-67	Krause, Jeremy C.	10623 Rock Springs Road	1			Residential, single family	
	10742	10.004-1-68	Murphy, Donna L.	10742 Autumn View Trl	1			Residential, single family	
		10.004-1-69	Murphy, Paul D.	Autumn View Trl		0.1		Vacant	<10 acres
	10727	10.004-1-70	Beeny, John L. Sr	10727 Autumn View Trl	1			Residential, single family	
	10733	10.004-1-71	Gierdowski, Paul	10733 Rock Springs Road	1			Residential, single family	
	10689	10.004-1-72	Denzien, Sharon L.	10689 Autumn View Trl	1			Residential, single family	
	10677	10.004-1-73	Ott, Joseph W.	10677 Autumn View Trl	1			Residential, single family	
	10723	10.004-1-75	Kosowski, Justin	10723 Rock Springs Road	1			Residential, single family	
	10749	10.004-1-54	Piscitelli, Lois A.	10749 Rock Springs Road	1			Residential, mfg housing	
	10740	10.004-1-55	Brooks, Edward W.	10740 Edies Road	1			Residential, single family	
	10710	10.004-1-56	Cycon, Patricia A.	10710 Dutch Hill Road	1			Residential, single family	
		10.004-1-10	Sommer, Matthew	Rock Springs Road	1			Vacant with improvements	
	10704	10.004-1-57	Blakely, Jean E.	10704 Dutch Hill Road	1			Residential, single family	
	10676	10.004-1-58	Crandall, Barbara	10676 Dutch Hill Road	1			Residential, single family	
	10666	10.004-1-59	Carrier, David J.	10666 Dutch Hill Road	1			Residential, single family	
	10733	10.004-1-60	Ferraro, Joseph	10733 Autumn View Trl	1			Residential, single family	
	10670	10.004-1-61	Nati, Teresa	10670 Autumn View Trl	1			Residential, single family	
	10690	10.004-1-62	Jankowski, Patti A.	10690 Autumn View Trl	1			Residential, single family	
		10.004-1-63	Oliver, Darlene J.	Autumn View Trl		0.1		Vacant	<10 acres
	10712	10.004-1-64	Fuller, Wayne P.	10712 Autumn View Trl	1			Residential, mfg housing	
	10714	10.004-1-28	Fuller, Betty M.	10714 Edies Road	1			Residential, single family	
	7186	10.003-2-20.1	Mahl, Matthew	7186 Peters Road	1			Residential, rural	
		19.001-2-2	Becker, David C.	7197 Peters Road		0.1		Vacant	<10 acres
	7185	19.001-2-3	Becker, David C.	7185 Peters Road	1			Residential, single family	
		10.003-2-20.2	Haddad, Holly	Miller Road			0.01	Vacant farmland	
	10613	10.003-2-19	Kinsey, Kenneth J.	10613 Miller Road	1			Residential, single family	
		10.004-1-50.1	Miller, Willard W.	9729 Rte 219			0.01	Dairy Farm	
	7087	19.001-2-4.2	Harshbarger, Larry O.	7087 Peters Road	1			Residential, single family	
	7081	19.001-2-5	Call, David A.	7081 Peters Road	1			Residential, single family	
		19.001-2-4.1	Feuz, Donald L.	Peters Road and Rte 219			0.01	Vacant farmland	
	10503	19.001-2-6	Ayler, Marcia G.	10503 Rte 219	1			Residential, single family	
		10.004-1-49.1	Miller, Willard W.	Rte 219			0.01	Vacant farmland	
		19.004-1-24	Miller, Tom A.	Rte 219 and East Otto Road			0.01	Vacant farmland	
		19.004-1-8.3	NYS DOT	Rte 219			0.01	Government	
		19.004-1-4.1	Atkinson, Scott W.	9886 Rte 219		0.1		Vacant, rural	
		19.004-1-8.1	Miller, Tom A.	Rte 219			0.01	Vacant farmland	
	9726	19.004-1-9.2	Czapla, Benedict	9726 Rte 219	1			Residential, mfg housing	
		19.004-1-9.1	Czapla, Elizabeth A.	9728 Rte 219	2			Residential, mfg housing	two mobile homes
	9718	19.004-1-8.2	Rappa, James J. Sr	9718 Rte 219	1			Residential, single family	
	9728	19.004-1-21	Miller, Anna M.	9728 Rte 219	1			Residential, rural	
		19.004-1-22	Miller, Anna M.	Rte 219 and East Otto Road		0.1		Vacant with improvements	
		19.004-1-19	Hanrahan, James	Rte 219		0.1		Vacant	<10 acres
		19.004-1-18	Hanrahan, James	Rte 219	1			Residential, seasonal	
		19.004-1-17	Lillis, Joyce	Rte 219		0.1		Vacant	<10 acres
	9669	19.004-1-16	Rose, Fundador	9669 Rte 219	1			Residential, mfg housing	
		19.004-1-15	Miller, Anna M.	Rte 219				Vacant, rural	
	9601	19.004-1-20	Cornell, Robert	9601 Rte 219	1			Residential, single family	
	9692	19.004-1-10	Lacosse, Steven	9692 Rte 219	1			Residential, single family	
	9664	19.004-1-11	Manaher, James M. Sr	9664 Rte 219	1			Residential, mfg housing	
	9682	19.004-1-13.2	Manaher, James M. Sr	9682 Rte 219	1			Residential, rural	
	9654	19.004-1-12	Barone, Scott	9654 Rte 219	1			Residential, single family	
	9612	19.004-1-13.1	Loretto, Kevin D.	9612 Rte 219	1			Residential, mfg housing	
	9592	19.004-1-14	Mansell, John T.	9592 Rte 219	1			Residential, single family	
		28.002-1-2.1	Hintz, David O.	9457 Snake Run Road				Dairy Farm	
	9472	28.002-1-5	Crawley, Patricia E.	9472 Rte 219	1			Residential, single family	
	9447	28.002-1-3	Ford, Richard A.	9447 Rte 219	1			Residential, single family	
	9415	28.002-1-4	Herbst, Keith B.	9415 Rte 219	1			Residential, single family	

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Municipality	Property #	Tax Map #	Owner	Location	EDUs	Vacant Developable	Vacant Non-Developable	Description	Notes
Miller Road down 219 South (3)	9434	28.002-1-43	Hess, Beverly	9434 Snake Run Road	1			Residential, single family	
	9378	28.002-1-6.1	Kozlowski, Anthony A.	9378 Rte 219	1			Residential, single family	
		28.002-1-42.1	Hess, Beverly R.	Rte 219		0.1		Vacant with improvements	
	9326	28.002-1-7	Frank, Donna J.	9326 Rte 219	1			Residential, single family	
		28.002-1-8	Ashford Hollow Cemetery	Rte 219				Cemetery	
		28.002-1-45	Frank, Donna J.	Rte 219		0.1		Vacant	<10 acres
		28.007-1-24	Ashford Grange #1342	9303 Rte 219	1			Social organization	
	9286	28.002-1-10	Domes, Alan P.	9286 Rte 219	1			Residential, single family	
	9260	28.007-1-1	Petruno, Leonard M. Jr	9260 Rte 219	1			Residential, single family	
		28.007-1-3	Genovese, Ralph J. Jr	Rte 219 and Neff Road		0.1		Vacant	<10 acres
	9293	28.007-1-23	Tharnish, Jack M.	9293 Rte 219	1			Residential, single family	
		28.002-1-41.2	Hintz, Timothy	Rte 219		0.1		Vacant with improvements	
		28.007-1-21	Hintz, Timothy	Rte 219		0.1		Vacant	<10 acres
		28.007-1-20	Heeb, Shirley	Rte 219	1			Residential, single family	
	9255	28.002-1-41.1	Hintz, Lee R.	9255 Rte 219	1			Residential, rural	
	9251	28.007-1-19	Conner, Michael	9251 Rte 219	1			Residential, single family	
		28.007-1-18	Genovese, Ralph J. Jr	Rte 219		0.1		Vacant	<10 acres
		28.002-1-40	Genovese, Ralph J. Jr	9241 Rte 219		0.1		Vacant commercial	
		28.007-1-17	Genovese, Ralph J. Jr	Rte 219		0.1		Vacant	<10 acres
	9225	28.007-1-16	Bouton, Jeremy	9225 Ahrens Road	1			Residential, single family	
	9226	28.007-1-6	Davis, Marlene Esther	9226 Rte 219	1			Residential, mfg housing	
	9218	28.007-1-4	Board, Stanley M.	9218 Rte 219	1			Residential, single family	
		28.007-1-14	Carson, Joel	9219 Rte 219				Restaurant	
		28.007-1-15	Carson, Joel	Rte 219		0.1		Vacant	<10 acres
	9210	28.007-1-8	Grover, Rodney Alan	9210 Rte 219	1			Residential, single family	
	9201	28.007-1-11	West Valley Fire Dist.	9201 Rte 219			0.01	Vacant commercial	
		28.007-1-12	West Valley Fire Dist. #1	Rte 219	1			Police and Fire	Fire Station
	9193	28.007-1-10	Hawley Development Corp.	9193 Rte 219	1			One story small structure	
	9214	28.007-1-7	Turner, Randy K.	9214 Rte 219	1			Residential, single family	
	9206	28.007-1-9	Worral, Donald J.	9206 Rte 219	1			Residential, single family	
	9196	28.002-1-17	Veith, Bernadine	9196 Rte 219	1			Residential, single family	
	9192	28.002-1-18	Doucette, Mark	9192 Rte 219	1			Residential, single family	
		28.002-1-32	Hansen, Roy	9182 Rte 219			0.01	Dairy Farm	
		28.004-2-3	Colden Valley Foundation	Rohr Hill Road		0.1		Vacant, rural	
	9158	28.002-1-19	Hansen, David L.	9158 Rte 219	1			Residential, single family	
		28.002-1-16.1	Occhiuto, Pasquale	Rte 219 and Rock Springs			0.01	Vacant, rural	Undevelopable
		28.002-2-31.3	Lavrey, Dale Michael	9120 Rte 219		0.1		Vacant, rural	
	9108	28.002-2-31.1	Cieslica, Michael	9108 Rte 219	1			Residential, rural	
		28.002-2-30	Cieslica, Michael	Rte 219		0.1		Vacant	<10 acres
	9161	28.002-1-21	Underhill, Kevin	9161 Rte 219	1			Residential, single family	
		28.002-1-22	Ford Bros Whlsle Meat Inc.	9129 Rte 219	1			Manufacturing	
		28.002-1-23	Ford, Brothers	9129 Rte 219		0.1		Vacant	<10 acres
	6588	28.002-2-29	Hess, Dwight C.	6588 Ashford Hollow Road	1			Residential with improvements	
	9111	28.002-1-24	Place, Richard C.	9111 Rte 219	1			Residential, mfg housing	
		28.002-1-27	Fruci, Vincent	Rte 219		0.1		Vacant	<10 acres
		28.002-1-28	Fruci, Vincent T.	Rte 219	1			Residential with improvements	
	6587	28.002-2-25.2	Robbins, Jordan	6587 Ashford Hollow Road	1			Residential, single family	
		28.002-2-25.5	Cattaraugus Co Ida	Rte 219 and Ashford Hollow Road				Office Building	
	9077	28.002-1-29	Decot, Dennis J.	9077 Rte 219	1			Residential, rural	
		28.008-1-30	Kamholz, Mark L.	Rte 219		0.1		Vacant, rural	
		28.002-2-25.3	Hudson, Scott D.	Rte 219		0.1		Vacant	<10 acres
		28.002-2-25.4	Hudson, Scott	9020 Rte 219		0.1		Storage	
	9013	28.002-1-31	Urf, Benjamin	9013 Rte 219	1			Residential, single family	
	8993	28.004-2-4	Griffith, Judy Ruth	8993 Rte 219	1			Residential, mfg housing	
	9012	28.002-2-23	Neuman, David H.	9012 Rte 219	1			Residential, mfg housing	
	9004	28.002-2-22	Kornacki, Jennifer M.	9004 Rte 219	1			Residential, mfg housing	
	8995	28.004-2-5	Phillips-Jackson, Billi Jo	8995 Rte 219	1			Residential, single family	
	8984	28.004-2-10	Nowak, Jared D.	8984 Rte 219	1			Residential, rural	
	8985	28.004-2-6	Edwards, Neil R.	8985 Rte 219	1			Residential, rural	
	8973	28.004-2-7	Martinkiewicz, David T.	8973 Rte 219	1			Residential, rural	
	8956	28.004-2-12	Costa, Thomas C.	8956 Rte 219	1			Residential, single family	
	8938	28.004-2-13	Nunweiler, David A.	8938 Rte 219	1			Residential, single family	
	8959	28.004-2-8	Tirado, Christopher	8959 Rte 219	1			Residential, rural	
	8935	28.004-2-25	Gray, Timothy R.	8935 Rte 219	1			Residential, single family	
	8920	28.004-2-14	Szabo, Char M.	8920 Rte 219	1			Residential, single family	
		28.004-2-27.1	Emerling, Roy L.	8937 Rte 219		0.1		Vacant, rural	
	8887	28.004-2-26.2	Cornell, Douglas W.	8887 Rte 219	1			Residential, single family	
		28.004-2-15	Gross, Gretchen S.	Rte 219		0.1		Vacant	<10 acres
	88892	28.004-2-16	Shaw, Dorothy	88892 Rte 219	1			Residential, single family	
		28.004-2-21	Lemere, Jeffrey D.	Rte 219	1			Residential, seasonal	
	8851	28.004-2-24	Sexton, Jack R. Jr	8851 Rte 219	2			Residential, multiple	
		28.004-2-23.3	Hughey, James G. Jr	8609 Rte 219		0.1		Vacant, rural	
	8559	28.004-2-23.1	Miller, Todd	8559 Rte 219	1			Residential, rural	
	8841	28.004-2-22	Cranston, Charles D.	8842 Rte 219	1			Residential, rural	
		28.004-2-23.2	Hughey, Richard G.	8616 Rte 219			0.01	Vacant farmland	
and Peters Road (1)		10.003-2-15.1	Harold Blesy Income Only Trust	7129 Henrietta Road			0.01	Dairy Farm	
	10983	10.003-2-12.3	Rappl, Joseph P.	10983 Scoby Road	1			Residential, single family	
		10.003-2-12.2	Rappl, Paul J.	Scoby Road		0.1		Vacant	<10 acres
		10.003-2-12.1	Rappl, Paul J.	Scoby Road	1			Residential, rural	
		10.003-2-13	Heidelberger, Joint Rev Tr	Scoby Road		0.1		Vacant	<10 acres
		10.003-2-30	Cty of Erie Dept of Parks	Scoby Road (Off)			0.01	County Park	
	7236	10.003-2-11.2	Blesy Farms, Llc	7236 Henrietta Road	1			Residential, rural	
	7235	10.003-2-11.1	Vacinek, Richard	7235 Henrietta Road	1			Residential, mfg housing	
		10.003-2-10	Harold Blesy Income Only Trust	Henrietta Road			0.01	Field Crops	
		10.003-2-5.1	Harold Blesy Income Only Trust	Henrietta Road			0.01	Field Crops	
	7336	10.003-2-7.1	Eagan, Alan C.	7336 Henrietta Road	1			Residential, mfg housing	
		10.003-2-24	Harold Blesy Income Only Trust	Henrietta Road			0.01	Dairy Farm	
		10.003-2-4.2	Harold Blesy Income Only Trust	Henrietta Road			0.01	Field Crops	
		10.003-2-8	Mest, Deborah R.	Henrietta Road		0.1		Vacant	<10 acres
		10.002-2-3	Harold Blesy Income Only Trust	Henrietta Road			0.01	Dairy Farm	
		10.002-2-1	Pawlik, Stephen R.	Henrietta Road	1			Residential, seasonal	
		10.002-2-2	Rose, Gary	Henrietta Road	1			Residential, seasonal	
	7418	10.003-2-5.2	Fuller, Alice M.	7418 Henrietta Road	1			Residential, mfg housing	
	7235	10.003-2-4.1	Vacinek, Richard	7235 Henrietta Road	3			Residential, triple family	
	7298	10.003-2-9	Larson, Ronald W.	7298 Henrietta Road	1			Residential, single family	
		10.003-2-15.6	Buffalo Crushed Stone	Henrietta Road	1			Manufacturing	estimate flow

Town of Ashford
Sewer District No. 1
Listing of Properies within proposed project area that will receive sewer service
Last modified: 6/4/2019

Municipality	Property #	Tax Map #	Owner	Location	EDUs	Vacant Developable	Vacant Non-Developable	Description	Notes
Henrietta Road		10.003-2-15.3	Cottage Industries Realty LLC	7024 Henrietta Road		0.1		Vacant commercial	
		10.003-2-16.2	Cottage Industries Realty LLC	Henrietta Road		0.1		Manufacturing	
		10.003-2-15.2	Niagara Mohawk Power Corp.	7025 Henrietta Road	1			Electric Distribution	
		10.003-2-16.1	Cottage Industries Realty LLC	Henrietta Road		0.1		Manufacturing	
	11024	10.003-2-14	Eagan, Alan C.	11024 Scoby Road	1			Residential, rural	
	10761	10.003-2-17	Wilson, Charles J.	10761 Miller Road	1			Residential, seasonal	
		19.001-2-1	Mahl, Family Limited	Peters Road		0.1		Vacant, rural	
		10.003-2-21.1	Mahl, Family Limited	Peters Road	1			Residential, rural	
		10.003-2-21.2	Mahl, Matthew J.	Peters Road	1			Residential, rural	
		10.003-2-22.1	Schichtel George V.	Peters Road	1			Nursery and Greenhouse	
		10.003-2-22.2	Mahl, Family Limited	Peters Road	1			Residential, rural	
		10.003-2-22.3	Schichtel's Nursery, Inc.,	7420 Peters Road		0.1		Nursery and Greenhouse	
		10.003-2-23	Mahl, Family Lp	Peters Road		0.1		Vacant	<10 acres
		19.001-2-30	Plewucha, Barbara D.	Rte 219 (Off)			0.01	Vacant, rural	Undevelopable
		19.001-2-29	Bryce, Charles Nancy	Rte 219 (Off)	1			Residential, seasonal	
		19.001-2-14	Grudzien, Henry A.	Rte 219 (Off)	1			Residential, seasonal	
		19.001-2-15	Weiss, James A.	Rte 219 (Off)	1			Residential, seasonal	
		19.001-2-16	Krayski, Rose A.	Rte 219 (Off)	1			Residential, seasonal	
		10.003-2-25.2	Schichtel's Nursery, Inc.,	Peters Road		0.1		Nursery and Greenhouse	

Town of Ashford
Sewer District No. 2
Listing of Properies within proposed project area that will receive sewer service
Last modified: 5/6/2019

FROM WV WATER DISTRICT:

#	Tax Account Number	Owner	Single Family	Multi Family	Commercial	Special	Vacant Developable	Vacant UnDevelopable	Comments
1	20.004-1-66	BERNARD L WILLIAMS					0.1		
2	20.004-1-64.1	KEVIN HEBDON					0.1		
3	20.004-1-64.2	COREY HICKEY	1						
5	20.004-1-63	LARRY J NAGEL	1						
6	20.004-1-62	LEGION 1576 AMERICAN			1				
7	20.004-1-61	RICHARD J (L/U) CONRAD	1						
8	20.004-1-64.3	RICHARD J CONRAD						0.01	Land locked parcel.
9	20.004-1-59.1	RICHARD J CONRAD						0.01	
10	20.004-1-59.6	RICHARD BERNSTEIN	1						
11	20.004-1-59.2	DANIEL HEBDON						0.01	
12	20.004-1-58	DANIEL HEBDON	1						
13	20.004-1-57	WARREN W SKINNER	1						
14	20.004-1-56	ROBERT DAVIS	1						
15	20.004-1-55	STEVEN WHEELER	1						
16	20.004-1-59.7	STEVEN WHEELER						0.01	Land locked parcel.
17	20.004-1-54	JR CHARLES M HARRIGAN	1						
18	20.004-1-59.3	JR CHARLES M HARRIGAN						0.01	Land locked parcel.
19	20.004-1-53	GARY C FRANK	1						
20	20.004-1-36.6	RANDALL W EHMAN					0.1		
21	20.004-1-52	JOHN W BOND	1						
22	20.004-1-51	JR CHARLES M HARRIGAN					0.1		
23	20.004-1-50	KARL F WITTMANN					0.1		
24	20.004-1-49	KARL WITTMANN	1						
25	20.004-1-48	DAVID BUCZEK	1						
26	20.004-1-47	JEFFREY R HYDE	1						
27	20.004-1-43	ANN H TR DAHLMAN					0.1		
28	20.004-1-46	JONATHAN M CZAPLA	1						
29	20.004-1-45	DUANE D WESTFALL	1						
30	20.004-1-44	ANN H DAHLMAN	1						
31	29.007-1-1	CECELIA M. SCHUMACHE	1						
32	29.007-1-2	OWEN C MELLON	1						
33	29.007-1-3	SHASHI K KHANNA	1						
34	29.007-1-4	TERRY J LILIENTHAL	1						
35	29.007-1-5	ANN H TR DAHLMAN		1.5					2 family residential.
36	29.007-1-6	EUGENE F NEAMON	1						
37	29.007-1-7	JOHN M WASHINGTON	1						
38	29.007-1-8	GREGORY J DAHLMAN					0.1		
39	29.007-1-9	GREGORY DAHLMAN					0.1		
40	29.007-1-10	MATTHEW M ULINGER					0.1		
41	29.007-1-11	MATTHEW M ULINGER					0.1		
42	29.007-1-12	MATTHEW M ULINGER	1						
43	29.007-1-13	HAROLD MORTON	1						
44	29.007-1-14	DAVID, M. JANKOWSKI	1						
45	29.007-1-15	DONALD M WILLIAMS	1						
46	29.007-1-16	DONALD A BEARDSLEY	1						
47	29.007-1-17	PAUL J FIEGEL	1						
48	29.007-1-19.3	WILLIAM T KING					0.1		
49	29.007-1-19.4	DONALD A BEARDSLEY					0.1		
50	29.007-1-19.2	RICHARD ALAN FORD					0.1		
51	29.007-1-19.1	FRED HAURI	1						
52	29.007-1-26	RALPH CHURCH	1						
53	29.007-1-25	JOSEPH E THIEL					0.1		
54	29.007-1-24.1	SCOTT THALER	1						
55	29.007-1-24.2	ROBERT L POTTER	1						
56	29.007-1-22	AUDREY M POTTER	1						
57	29.007-1-20	WILLIAM T KING	1		1				1 parcel, but split on both sides of the road. House on one side and commercial on the other. Assumes service to each.
59	29.007-1-33	JOSEPH E THIEL	1						
60	29.007-1-32	MARIE E THIEL					0.1		
61	29.007-1-31	NIAGARA MOHAWK POWER CORP						0.01	
62	29.007-1-30	RICHARD A BISHOP	1						
63	29.007-1-29	ADAM L FISHER	1						
64	29.007-1-28	JOHN N SELTZER	1						
65	29.007-1-27	BRADLEY M BRIDGES	1						
66	29.007-1-35.2	GEORGE A KAZMIERCZAK	1						
67	29.007-1-35.1	GRETA B SHUSTER	1						
68	29.007-1-35.3	JOSEPH E THIEL						0.01	Land locked.
69	29.007-2-1	GERALD A FELDMAN	1						
70	29.007-2-2.2	ERIC J MCRAE	1						
71	29.007-2-3	MICHAEL T WILLIAMS	1						
72	29.007-2-4	KENNETH M IVES	1						
73	29.007-2-2.1	ERIC J MCRAE						0.01	Land locked.
74	29.007-2-21	BRADLEY T OSBORNE	1						
75	29.007-2-19.2	TC AUTOMOTIVE SERVICE,LLC			1				
76	29.007-2-19.3	KERIN MOTORS INC			1				
77	29.007-2-19.1	JAMES D BOND						0.01	Storage building and land locked.
78	29.007-2-18	ROBERT D EHMAN					0.1		
79	29.007-2-17	THERESA V SCHMITT	1						
80	29.007-2-16	ROBERT L EDWARDS JR	1						
81	29.007-2-15	PAUL D WILLIAMS	1						
82	29.007-2-14	CLAYTON OSBORNE	1						
83	29.007-2-13	WALTER STROMAYER	1						
84	29.007-2-12	MICHAEL A FULLER		1.5					2 family residential.
85	29.007-2-11	CHARLES PFEFFER		1.5					2 family residential.
86	29.007-2-10	MARY JANE SCOUTEN	1						
87	29.007-2-9	ROBIN FREY	1						
88	29.007-2-8	JANE ENGELS	1						
89	29.007-2-7	MARC GENTNER	1						
90	29.007-2-6	THERESA M GENTNER	1						
91	29.007-2-5	PHILIP D GOODEMOTE JR	1						
92	29.011-2-16	CARL RADOTAVICH			1				
93	29.011-2-15	RAY WILLIAMS	1						
94	29.011-2-14	DIANE K PERKINS	1						
95	29.011-2-13	KATHRYN ALDROW-BOBE	1						
96	29.011-2-12	RICHARD N. SCOTT REVO	1						
97	29.011-2-11	CHRISTOPHER M ENSER	1						
98	29.011-2-10	JAMES A WEBSTER		2					3 family residential.

99	29.011-2-9	PAULINE ENGELS	1						
100	29.011-2-8.1	REGIS C GENTNER	1						
101	29.011-2-8.2	A & D ENGELS INC						0.01	Land locked.
102	29.011-2-6	A & D ENGELS INC			1				
103	29.011-2-7	A & D ENGELS INC			2				Tanker truck operation that uses water to clean tankers. Assumes 600 gpd, but could be more.
104	29.011-2-5	OVERINE BUNNELL	1						
105	29.011-2-4	LAURA J ORTEGA	1						
106	29.011-2-3	ANN H TR DAHLMAN		3					2 buildings with 2 apartments each. Assumes each building gets a service, so 1.5 x 2 = 3.
107	29.011-2-2	JESSICA RADICE	1						
108	29.011-2-1	ST JOHN BAPTIST CHURC	1		1				1 unit for house and 1 unit for church. Separate service lines.
109	29.011-2-52	LARRY WILLIAMS	1						
110	29.011-2-51	ST PAULS UNITED	1		1				1 unit for house and 1 unit for church. Separate service lines.
111	29.011-2-50	ELIZABETH C KLEIN		2					3 family residential.
112	29.011-2-49	HARRY KRUSE	1						
113	29.011-2-48	JOSEPH J PATTI				1.5			Primary use is commercial with a single apartment.
114	29.011-2-47	GEORGE NEUDECK	1						
115	29.011-2-46	CHRISTOPHER GERWITZ	1	1.5					2 buildings, assuming each gets a service line. 1 single family and the other a 2 family.
116	29.011-2-45	H MICHAEL PARISH	1						
117	29.011-2-44	TIM A ENGELS	1						
118	29.011-2-43	ASHFORD HISTORICAL			1				
120	29.011-2-17	VALLEY CENTRAL WEST				10			Estimated 1st year is 300 students assuming 10 gpd per student.Actual values will be based on annual water usage after year 1.
121	29.011-2-42	ASHLEY AUMAN	1						
122	29.011-2-41	SHAWN BRYANT	1						
123	29.011-2-40	JANET L S VANT	1						
124	29.011-2-39	DARLA SPENCER	1						
125	29.011-2-38	VALLEY VOL HOSE CO WEST						0.01	Land locked.
126	29.011-2-37	JOSEPH COSTA				1.5			Primary use is commercial with a single apartment.
127	29.011-2-34	JOSEPH F COSTA					0.1		
128	29.011-2-31	FRANCESCO COSTA				3			Primary use is commercial with a 4 apartments.
129	29.011-2-32	FRANCESCO COSTA					0.1		
130	29.011-2-33	ELAINE HOMOLA						0.01	
131	29.011-2-35.1	TRICIA JENNISON	1						
132	29.011-2-36	JOSEPH F COSTA						0.01	Land locked.
133	29.011-2-27	HARRY BINGENHEIMER	1						
134	29.011-2-26	JANE HUGHEY		1.5					2 family residential.
135	29.011-2-25	RICHARD R PRESTON	1						
136	29.011-2-24	DARLENE A PERKINS	1						
137	29.011-2-23	DALE FRANK	1						
138	29.011-2-22	DALE L FRANK						0.01	
139	29.011-2-18	TIM FRANCES ENGELS	1						
140	29.011-2-19.1	DEAN G WILLIAMS	2		1				2 houses plus commercial building. Assumes 3 service lines.
141	29.011-2-20	JOHN C GEBAUER	1						
142	29.002-1-22.2	JOHN C GEBAUER						0.01	
143	29.011-2-19.2	BEATRICE N WILLIAMS	1						Single family house, but land locked.
144	29.002-1-22.3	LEONARD F GERWITZ					0.1		
145	29.002-1-22.1	ALAN L GERWITZ	1						
146	29.002-1-25	BONNIE L SPENCER	1						
147	29.002-1-24	DOUGLAS BERNHOFT	1						
148	29.002-1-23	DOLORES E LUX	1						
149	29.002-1-20	GEORGE F KAZMIERCZAK	1						
150	29.002-1-19	GREGORY KERL		1.5					2 family residential.
151	29.002-1-16.1	JOANNE R WEAVER					0.1		
152	29.002-1-18	DENNIS F HAURI	1						
153	29.002-1-16.4	ROBERT J LUKOWSKI	1						
154	29.002-1-16.14	VALLEY CRYSTAL WATER WEST					0.1		
156	29.002-1-21	ROBERT COMSTOCK	2						2 houses, each getting a service line.
157	29.002-1-26.1	JOHN A PFEFFER	1						
158	29.002-1-26.2	JOHN PFEFFER	1						
159	29.011-2-21	ELAINE M GERWITZ	1						
160	29.002-1-27	JOHN A PFEFFER						0.01	Land locked.
161	29.002-1-28	DWIGHT J LINGENFELTER	1						
162	29.001-2-9.2	SHAWN M LAFFERTY	1						
163	29.001-2-9.1	FREDERICK HAURI	1						
164	29.011-2-28.2	DONALD A TURNER	1						
165	29.011-2-30	CHERYL M BERNHOFT	1						
166	29.011-2-29	DAVID E MIZELL	1						
167	29.011-2-28.1	AUDREY R TURNER					0.1		
168	29.011-1-20	PAUL F SCHULZ	1						
169	29.011-1-19	BRETT BRADLEY	1						
170	29.011-1-18	RICHARD R DE KAY	1						
171	29.011-1-17	GARY F KELLEY	1						
172	29.011-1-16	JAMES D ABBOTT		1.5					2 family residential.
173	29.011-1-14	BRIAN WULFF		2.5					4 family residential.
174	29.011-1-13	BRIAN WULFF					0.1		
175	29.011-1-12	JANICE A FISHER		3					5 family residential.
176	29.011-1-11	EDWIN W BAKER	1						
177	29.011-1-10	MICHAEL L WINSOR	1						
178	29.011-1-9	TIM A ENGELS		1.5					2 family residential.
179	29.011-1-8.2	JASON A CZAPLA	1						
180	29.011-1-8.1	JASON A CZAPLA						0.01	Land locked.
181	29.011-1-7	TELECOM UCI CITIZENS						0.01	Telecom building without water. Parcel is land locked.
182	29.011-1-6	CHARLES FULLER				1.5			Commercial building with a single apartment.
183	29.011-1-5	NATHAN HARDY		2.5					4 family residential.
184	29.011-1-4	JERRY KOHLBACHER	1						
185	29.011-1-3.2	LEONARD PAWLOWSKI	1						
186	29.011-1-3.1	TOWN OF ASHFORD					0.1		
187	29.011-1-2	ELIZABETH M SCHULZE		1.5					2 family residential.
188	29.011-1-1	WILLIAM J SLOAND	1						
189	29.007-3-19	CHRISTOPHER C GERWIT	1						
190	29.007-3-18	JUNE A CHURCHILL	1						
191	29.007-3-17	TOWN OF ASHFORD			1				

192	29.007-3-16	EDWARD I AHRENS	1						
193	29.007-3-15	KENTON HOPPEL	1						
194	29.007-3-14	SALLY HEINZ	1						
195	29.007-3-13	SHEILA EHMAN	1						
196	29.007-3-12	CHAD D NEAL	1						
197	29.007-3-11	NAOMI A MADDOX	1						
198	29.007-3-8	EDWARD DARLING	1						
199	29.007-3-9	CHARLES E PFEFFER	1						
200	29.007-3-10	CHARLES E PFEFFER					0.1		
201	29.007-3-20.1	LAWRENCE FELDMAN		1.5					2 family residential.
202	29.007-3-20.2	LAWRENCE D FELDMAN		1.5					2 family residential.
203	29.007-3-26	JEAN M MORGAN BOND	1						
204	29.007-3-27	L JEANNE WESTFALL	1						
205	29.001-1-12.1	CLIFFORD H FELDMAN	1			1			House with commercial building.
206	29.007-3-24	WILLIAM M WELLING	1						
207	29.007-3-25.2	JOHN BURLINGAME	1						
208	29.007-3-25.1	JAN M ROBBINS	1						
209	29.007-3-21	DONALD J FELDMAN		1.5					2 family residential.
210	29.007-3-22	JAMES A WEBSTER	1						
211	29.007-3-23	JAMES A WEBSTER					0.1		
212	29.001-1-12.2	THOMAS W NOWAK	1						
213	29.001-1-11.3	DONALD R ESTATE WEAST					0.1		
214	29.001-1-11.2	DANIEL J FELDMAN	1						
215	29.007-3-7	SANDRA BERNHOFT	1						
216	29.007-3-6	HOMES INC CORNERSTO	1						
217	29.007-3-5	TIMOTHY J DOWNEY	1						
218	29.007-3-4	KIMBER A WULF	1						
219	29.001-1-11.1	MARC CASTER	1						
220	29.001-1-11.4	RICHARD P ENSER	1						Single family house, but on a land locked parcel.
221	29.007-3-2	DAWN M SAMBROSKI		2.5					2 buildings with 2 apartments each. Assuming a single service line.
222	29.007-3-1	DAWN MARIE SAMBORSK	1						
223	29.007-1-36	JAMES G SPROSS	1						
224	29.007-1-37	DAVID A AHLES					0.1		
225	29.001-1-10	DAVID A AHLES	1						
226	29.007-1-38	STEPHEN L KRUSE	1						
227	29.001-1-9.2	DONALD P KEARNEY	1						
228	29.001-1-9.1	DOUGLAS F BERNHOFT	1						
229	29.007-1-39	MYRTLE M CUSSEN	1						
230	29.007-1-40	LOUIS E FELDMAN	1						
231	20.003-2-11.2	LOUIS E FELDMAN						0.01	Land locked parcel.
232	20.003-2-11.1	DONALD J FELDMAN							
233	20.003-2-10	ROBERT EHMAN	1						
234	20.003-2-17	JAY EVERETT PRINTUP						0.01	
235	20.003-2-9.1	GARY J FELDMAN	2			7			Dairy farm with 2 houses. Assuming water will used 100 dairy cows.
236	20.003-2-9.2	CARL JERGE	1						
237	20.003-2-8	NICHOLAS P RINKO	1						
238	20.003-2-7	JOHN E PFEFFER	1						
239	20.003-2-6	JASON M FOLEY	1						
240	20.003-2-5.1	KEVIN HEBDON	1			4			Dairy farm with 1 house. Assuming water will used for 60 beef cows. Assuming separate service lines.
241	20.003-2-4.2	ROBERT C CONRAD	1						
242	20.003-2-4.1	ROBERT P CONRAD	1						
243	20.003-2-3	ROBERT P CONRAD					0.1		
244	29.002-1-16.12	CAROLYN M WALSH	1						
245	29.002-1-16.15	ROBERT TRUSIAK					0.1		
246	29.002-1-16.10	TIMOTHY A GOGGIN						0.01	
247	29.002-1-16.23	DOUGLAS STUDD	1						
248	29.002-1-16.9	PATRICIA L ANDERSON	1						
249	29.002-1-16.11	JOHN MCDOWELL	1						
250	29.002-1-16.21	JOHN MCDONWELL					0.1		
251	29.002-1-16.13	VALLEY FIRE DIST #1 WEST			1				
252	29.002-1-16.8	VALLEY VOL HOSE CO WEST			1				
253	29.002-1-16.7	ARTHUR W GREEN JR	1						
		Sub-Total	**166**	**35.5**	**15**	**29.5**	**3.1**	**0.21**	
		Total EDU's			**249.31**				

Appendix E

Project Site Information

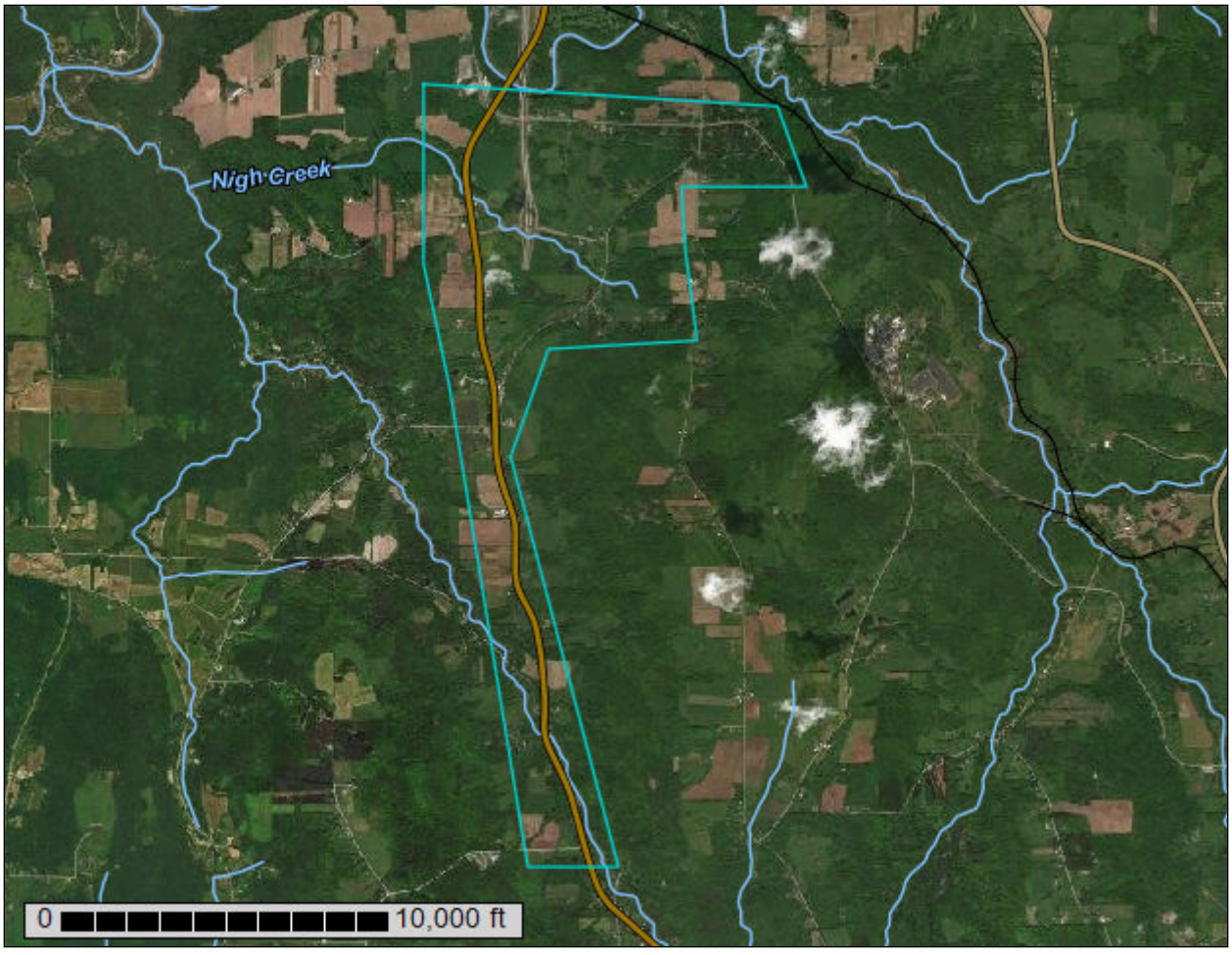
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Cattaraugus County, New York, and Erie County, New York



May 30, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

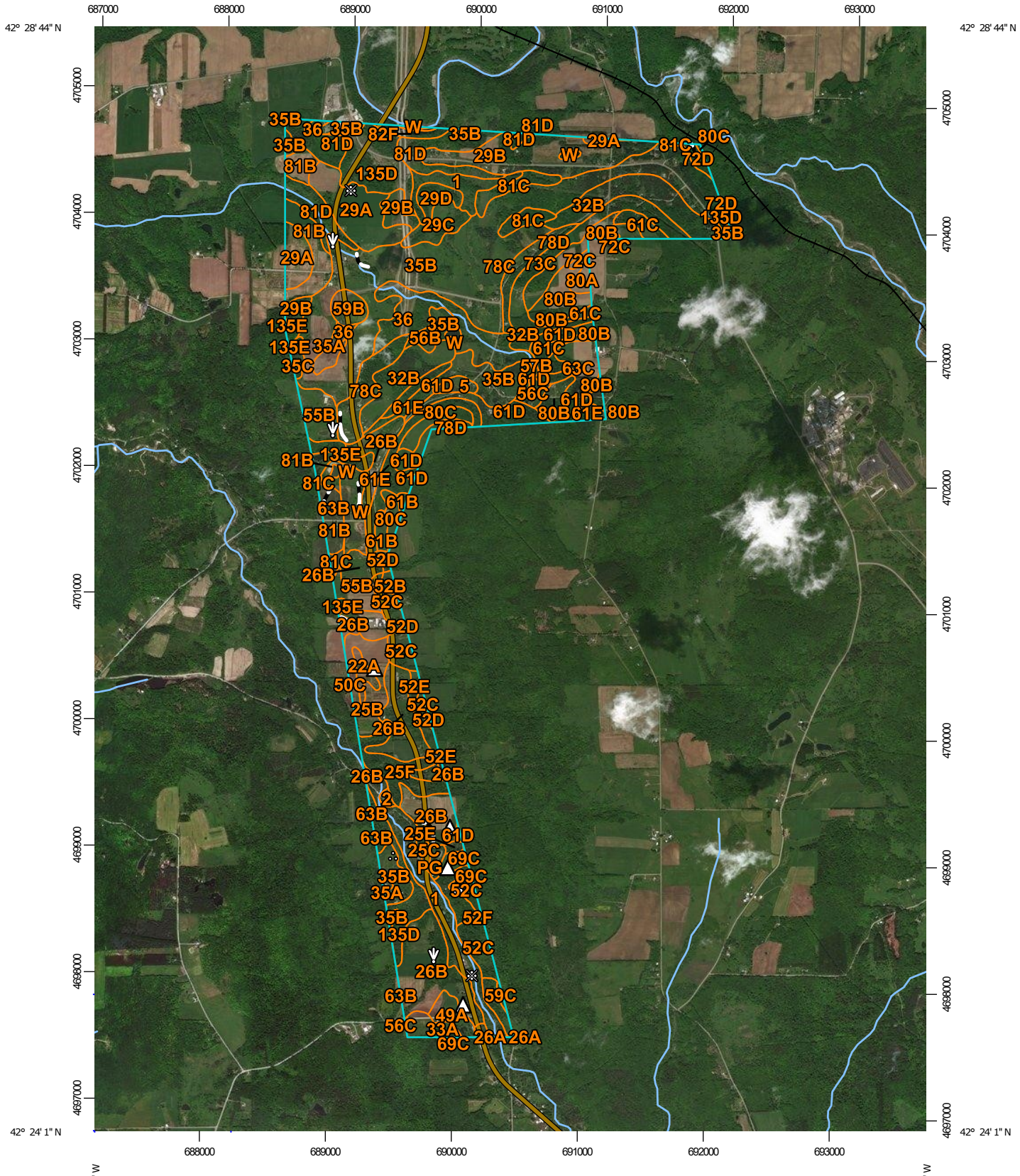
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



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 scales ranging from 1:15,800 to 1:24,000.

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: Cattaraugus County, New York
Survey Area Data: Version 19, Sep 2, 2018

Soil Survey Area: Erie County, New York
Survey Area Data: Version 18, Sep 2, 2018

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Jul 29, 2011—Oct 18, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

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
1	Udifluvents and Fluvaquents, frequently flooded	99.6	4.1%
2	Hamlin silt loam	2.8	0.1%
5	Wayland soils complex, 0 to 3 percent slopes, frequently flooded	8.5	0.4%
22A	Allard silt loam, 0 to 3 percent slopes	9.5	0.4%
25B	Chenango gravelly silt loam, 3 to 8 percent slopes	43.7	1.8%
25C	Chenango gravelly silt loam, 8 to 15 percent slopes	5.4	0.2%
25E	Chenango gravelly silt loam, 25 to 35 percent slopes	2.8	0.1%
25F	Chenango gravelly silt loam, 35 to 50 percent slopes	40.8	1.7%
26A	Chenango channery silt loam, fan, 0 to 3 percent slopes	0.1	0.0%
26B	Chenango channery silt loam, fan, 3 to 8 percent slopes	236.2	9.8%
29A	Chenango fine gravelly sandy loam, 0 to 3 percent slopes	88.0	3.7%
29B	Chenango fine gravelly sandy loam, 3 to 8 percent slopes	117.0	4.9%
29C	Chenango fine gravelly sandy loam, 8 to 15 percent slopes	24.1	1.0%
29D	Chenango fine gravelly sandy loam, 15 to 25 percent slopes	14.7	0.6%
32B	Churchville silt loam, 3 to 8 percent slopes	115.2	4.8%
33A	Wallington silt loam, 0 to 3 percent slopes	3.9	0.2%
35A	Rhinebeck silt loam, 0 to 3 percent slopes	11.0	0.5%
35B	Rhinebeck silt loam, 3 to 8 percent slopes	451.3	18.8%
35C	Rhinebeck silt loam, 8 to 15 percent slopes	6.8	0.3%
36	Canadice silty clay loam	85.0	3.5%
49A	Red Hook silt loam, 0 to 3 percent slopes	16.4	0.7%
50C	Canaseraga silt loam, 8 to 15 percent slopes	0.0	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
52B	Valois gravelly silt loam, 3 to 8 percent slopes	11.7	0.5%
52C	Valois gravelly silt loam, 8 to 15 percent slopes	62.7	2.6%
52D	Valois gravelly silt loam, 15 to 25 percent slopes	21.0	0.9%
52E	Valois gravelly silt loam, 25 to 35 percent slopes	5.1	0.2%
52F	Valois gravelly silt loam, 35 to 50 percent slopes	1.6	0.1%
55B	Darien silt loam, 3 to 8 percent slopes	43.5	1.8%
56B	Chautauqua silt loam, 3 to 8 percent slopes	8.8	0.4%
56C	Chautauqua silt loam, 8 to 15 percent slopes	18.9	0.8%
57B	Busti silt loam, 3 to 8 percent slopes	5.4	0.2%
59B	Yorkshire channery silt loam, 3 to 8 percent slopes	16.1	0.7%
59C	Yorkshire channery silt loam, 8 to 15 percent slopes	1.6	0.1%
60B	Napoli silt loam, 3 to 8 percent slopes	10.8	0.4%
61B	Schuyler silt loam, 3 to 8 percent slopes	9.4	0.4%
61C	Schuyler silt loam, 8 to 15 percent slopes	22.9	1.0%
61D	Schuyler silt loam, 15 to 25 percent slopes	68.2	2.8%
61E	Schuyler silt loam, 25 to 35 percent slopes	55.9	2.3%
63B	Langford channery silt loam, 3 to 8 percent slopes	28.7	1.2%
63C	Langford channery silt loam, 8 to 15 percent slopes	33.7	1.4%
69C	Erie channery silt loam, 8 to 15 percent slopes	2.8	0.1%
72C	Towerville silt loam, 8 to 15 percent slopes	3.4	0.1%
72D	Towerville silt loam, 15 to 25 percent slopes	6.0	0.3%
73C	Gretor channery silt loam, 8 to 15 percent slopes	25.3	1.1%
78C	Hornell silt loam, 8 to 15 percent slopes	61.9	2.6%
78D	Hornell silt loam, 15 to 25 percent slopes	55.3	2.3%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
80A	Fremont silt loam, 0 to 3 percent slopes	7.2	0.3%
80B	Fremont silt loam, 3 to 8 percent slopes	66.7	2.8%
80C	Fremont silt loam, 8 to 15 percent slopes	26.7	1.1%
81B	Varysburg gravelly silt loam, 3 to 8 percent slopes	62.0	2.6%
81C	Varysburg gravelly silt loam, 8 to 15 percent slopes	47.8	2.0%
81D	Varysburg gravelly silt loam, 15 to 25 percent slopes	90.5	3.8%
82F	Rock outcrop-Manlius complex, 35 to 70 percent slopes	8.7	0.4%
135C	Hudson silt loam, 8 to 15 percent slopes	0.7	0.0%
135D	Hudson silt loam, 15 to 25 percent slopes	99.4	4.1%
135E	Hudson silt loam, 25 to 35 percent slope	16.1	0.7%
PG	Pits, gravel	5.9	0.2%
W	Water	8.5	0.4%
Subtotals for Soil Survey Area		**2,403.6**	**100.0%**
Totals for Area of Interest		**2,404.1**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
W	Water	0.5	0.0%
Subtotals for Soil Survey Area		**0.5**	**0.0%**
Totals for Area of Interest		**2,404.1**	**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.

Cattaraugus County, New York

1—Udifluvents and Fluvaquents, frequently flooded

Map Unit Setting

National map unit symbol: 9q83
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Udifluvents and similar soils: 40 percent
Fluvaquents and similar soils: 35 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udifluvents

Setting

Landform: Flood plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Alluvium with a wide range of texture

Typical profile

H1 - 0 to 9 inches: gravelly loamy sand
H2 - 9 to 70 inches: very gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.06 to 19.98 in/hr)
Depth to water table: About 24 to 72 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water storage in profile: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A
Hydric soil rating: No

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 12 inches: gravelly sandy loam
H2 - 12 to 72 inches: very gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.06 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Moderate (about 6.2 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

Wyalusing

Percent of map unit: 10 percent
Landform: Flood plains
Hydric soil rating: Yes

Canandaigua

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

Holderton

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

Wayland

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

2—Hamlin silt loam

Map Unit Setting

National map unit symbol: 9q9k
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Hamlin and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hamlin

Setting

Landform: Flood plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Silty alluvium mainly from areas of siltstone, shale, and limestone

Typical profile

H1 - 0 to 10 inches: silt loam
H2 - 10 to 17 inches: very fine sandy loam
H3 - 17 to 36 inches: silt loam
H4 - 36 to 72 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
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 36 to 72 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water storage in profile: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

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

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

Wayland
Percent of map unit: 3 percent
Landform: Flood plains
Hydric soil rating: Yes

Udifluvents
Percent of map unit: 2 percent
Hydric soil rating: No

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

5—Wayland soils complex, 0 to 3 percent slopes, frequently flooded

Map Unit Setting
National map unit symbol: 2srgv
Elevation: 160 to 1,970 feet
Mean annual precipitation: 31 to 68 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition
Wayland and similar soils: 60 percent
Wayland, very poorly drained, and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wayland

Setting
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty and clayey alluvium derived from interbedded sedimentary rock

Typical profile

A - 0 to 6 inches: silt loam
Bg1 - 6 to 12 inches: silt loam
Bg2 - 12 to 18 inches: silt loam
C1 - 18 to 46 inches: silt loam
C2 - 46 to 72 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Very high (about 12.6 inches)

Interpretive groups

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

Description of Wayland, Very Poorly Drained

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Silty and clayey alluvium derived from interbedded sedimentary rock

Typical profile

A - 0 to 6 inches: mucky silt loam
Bg1 - 6 to 12 inches: silt loam
Bg2 - 12 to 18 inches: silt loam
C1 - 18 to 46 inches: silt loam
C2 - 46 to 72 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Very high (about 12.8 inches)

Interpretive groups

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

Minor Components

Wakeville

Percent of map unit: 10 percent
Landform: Flood plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

22A—Allard silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9q9q
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Allard and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Allard

Setting

Landform: Alluvial fans, outwash plains, terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Silty eolian, glaciolacustrine, or old alluvial deposits over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 34 inches: silt loam
H3 - 34 to 72 inches: stratified very gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Olean

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

Scio

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

Unnamed soils

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

Chenango

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

25B—Chenango gravelly silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9q9t
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Chenango and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chenango

Setting

Landform: Valley trains, terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

Typical profile

H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 30 inches: very gravelly silt loam
H3 - 30 to 72 inches: stratified very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Allard

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

Castile

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

Valois

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

Unnamed soils

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

25C—Chenango gravelly silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9q9v
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Chenango and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chenango

Setting

Landform: Valley trains, terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

Typical profile

H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 30 inches: very gravelly silt loam
H3 - 30 to 72 inches: stratified very gravelly sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

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

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

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

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

25E—Chenango gravelly silt loam, 25 to 35 percent slopes

Map Unit Setting
National map unit symbol: 9q9x
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Not prime farmland

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

Description of Chenango

Setting
Landform: Valley trains, terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

Typical profile
H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 30 inches: very gravelly silt loam
H3 - 30 to 72 inches: stratified very gravelly sand

Properties and qualities
Slope: 25 to 35 percent

Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Valois

Percent of map unit: 12 percent
Hydric soil rating: No

Chadakoin

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

Udifluvents

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

25F—Chenango gravelly silt loam, 35 to 50 percent slopes

Map Unit Setting

National map unit symbol: 9q9y
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Chenango

Setting

Landform: Valley trains, terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser

Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

Typical profile

H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 30 inches: very gravelly silt loam
H3 - 30 to 72 inches: stratified very gravelly sand

Properties and qualities

Slope: 35 to 50 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Valois

Percent of map unit: 12 percent
Hydric soil rating: No

Chadakoin

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

Udifluvents

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

26A—Chenango channery silt loam, fan, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 1nq9p
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Chenango, Fan

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

Typical profile

H1 - 0 to 9 inches: channery silt loam
H2 - 9 to 45 inches: very channery fine sandy loam
H3 - 45 to 72 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water storage in profile: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Castile

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

Middlebury

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

Unnamed soils

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

Valois

Percent of map unit: 2 percent
Hydric soil rating: No

26B—Chenango channery silt loam, fan, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9qb0
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Chenango, Fan

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

Typical profile

H1 - 0 to 9 inches: channery silt loam
H2 - 9 to 45 inches: very channery fine sandy loam
H3 - 45 to 72 inches: very gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water storage in profile: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

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

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

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

Valois
Percent of map unit: 2 percent
Hydric soil rating: No

29A—Chenango fine gravelly sandy loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 9qb4
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Chenango and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chenango

Setting
Landform: Valley trains, terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

Typical profile
H1 - 0 to 9 inches: fine gravelly sandy loam
H2 - 9 to 30 inches: fine gravelly sandy loam
H3 - 30 to 72 inches: very gravelly loamy sand

Properties and qualities
Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Castile

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

Colonie

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

Allard

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

29B—Chenango fine gravelly sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9qb5
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Chenango and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chenango

Setting

Landform: Valley trains, terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread

Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

Typical profile
H1 - 0 to 9 inches: fine gravelly sandy loam
H2 - 9 to 30 inches: fine gravelly sandy loam
H3 - 30 to 72 inches: very gravelly loamy sand

Properties and qualities
Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

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

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

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

29C—Chenango fine gravelly sandy loam, 8 to 15 percent slopes

Map Unit Setting
National map unit symbol: 9qb6
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Chenango and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chenango

Setting

Landform: Valley trains, terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

Typical profile

H1 - 0 to 9 inches: fine gravelly sandy loam
H2 - 9 to 30 inches: fine gravelly sandy loam
H3 - 30 to 72 inches: very gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Castile

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

Colonie

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

Allard

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

29D—Chenango fine gravelly sandy loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9qb7
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Chenango and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chenango

Setting

Landform: Valley trains, terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

Typical profile

H1 - 0 to 9 inches: fine gravelly sandy loam
H2 - 9 to 30 inches: fine gravelly sandy loam
H3 - 30 to 72 inches: very gravelly loamy sand

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

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

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

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

Castile
Percent of map unit: 2 percent
Hydric soil rating: No

32B—Churchville silt loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 9qbf
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Churchville and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Churchville

Setting
Landform: Till plains, lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey glaciolacustrine deposits over loamy till

Typical profile
H1 - 0 to 14 inches: silt loam
H2 - 14 to 37 inches: silty clay loam
H3 - 37 to 72 inches: gravelly silt loam

Properties and qualities
Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches

Natural drainage class: Somewhat poorly drained
Runoff class: Very high
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: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.9 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

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

Unnamed soils
Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

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

Canandaigua
Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: Yes

33A—Wallington silt loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 9qbh
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Wallington and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wallington

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 8 inches: silt loam
H2 - 8 to 14 inches: silt loam
H3 - 14 to 38 inches: silt loam
H4 - 38 to 72 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 12 to 24 inches to fragipan
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
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 storage in profile: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Tonawanda

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

Williamson

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

Unnamed soils

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Canandaigua

Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

35A—Rhinebeck silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9qbk
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Prime farmland if drained

Map Unit Composition

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

Description of Rhinebeck

Setting

Landform: Lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 13 inches: silty clay loam
H3 - 13 to 38 inches: silty clay
H4 - 38 to 72 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
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
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

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

Canadice
Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Canandaigua
Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

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

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

35B—Rhinebeck silt loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 9qbl
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Prime farmland if drained

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

Description of Rhinebeck

Setting
Landform: Lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile
H1 - 0 to 9 inches: silt loam

H2 - 9 to 13 inches: silty clay loam
H3 - 13 to 38 inches: silty clay
H4 - 38 to 72 inches: silty clay loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
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
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Canadice

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Canandaigua

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Churchville

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

Collamer

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

Niagara

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

35C—Rhinebeck silt loam, 8 to 15 percent slopes

Map Unit Setting

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

Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Rhinebeck

Setting

Landform: Lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 13 inches: silty clay loam
H3 - 13 to 38 inches: silty clay
H4 - 38 to 72 inches: silty clay loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
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
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Canadice

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Canandaigua

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

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

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

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

36—Canadice silty clay loam

Map Unit Setting
National map unit symbol: 9qbn
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Farmland of statewide importance

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

Description of Canadice

Setting
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Clayey glaciolacustrine deposits

Typical profile
H1 - 0 to 8 inches: silty clay loam
H2 - 8 to 42 inches: silty clay
H3 - 42 to 72 inches: stratified silty clay loam to silty clay

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None

Frequency of ponding: None
Available water storage in profile: High (about 9.3 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: D
Hydric soil rating: Yes

Minor Components

Canandaigua
Percent of map unit: 9 percent
Landform: Depressions
Hydric soil rating: Yes

Getzville
Percent of map unit: 9 percent
Landform: Depressions
Hydric soil rating: Yes

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

Unnamed soils
Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

49A—Red Hook silt loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 9qcc
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Prime farmland if drained

Map Unit Composition
Red hook and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Red Hook

Setting
Landform: Valley trains, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave

Across-slope shape: Linear
Parent material: Loamy glaciofluvial deposits

Typical profile
H1 - 0 to 9 inches: silt loam
H2 - 9 to 32 inches: gravelly loam
H3 - 32 to 72 inches: very gravelly sandy loam

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
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 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.3 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Hydric soil rating: No

Minor Components

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

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

Lamson
Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

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

50C—Canaseraga silt loam, 8 to 15 percent slopes

Map Unit Setting
National map unit symbol: 9qcs
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches

Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Canaseraga and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canaseraga

Setting

Landform: Drumlinoid ridges, hills, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: A silty mantle over loamy till derived from siltstone, shale, and sandstone, with varying amounts of limestone

Typical profile

H1 - 0 to 5 inches: silt loam
H2 - 5 to 23 inches: silt loam
H3 - 23 to 28 inches: silt loam
H4 - 28 to 72 inches: channery silt loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 18 to 34 inches to fragipan
Natural drainage class: Moderately well drained
Runoff class: Very high
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: About 14 to 23 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Dalton

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

Mardin

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

Schuyler

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

Unnamed soils

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

52B—Valois gravelly silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9qcz
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Valois and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Valois

Setting

Landform: End moraines, valley sides, lateral moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from sandstone, siltstone, and shale

Typical profile

H1 - 0 to 6 inches: gravelly silt loam
H2 - 6 to 27 inches: gravelly silt loam
H3 - 27 to 48 inches: gravelly loam
H4 - 48 to 72 inches: very gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 2 percent
Available water storage in profile: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

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

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

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

Unnamed soils
Percent of map unit: 2 percent
Hydric soil rating: No

Mardin
Percent of map unit: 2 percent
Hydric soil rating: No

52C—Valois gravelly silt loam, 8 to 15 percent slopes

Map Unit Setting
National map unit symbol: 9qd0
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Valois and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Valois

Setting
Landform: Valley sides, lateral moraines, end moraines
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from sandstone, siltstone, and shale

Typical profile

H1 - 0 to 6 inches: gravelly silt loam
H2 - 6 to 27 inches: gravelly silt loam
H3 - 27 to 48 inches: gravelly loam
H4 - 48 to 72 inches: very gravelly sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 2 percent
Available water storage in profile: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Castile

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

Chautauqua

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

Chenango

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

Mardin

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

52D—Valois gravelly silt loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9qd1
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days

Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Valois

Setting

Landform: End moraines, valley sides, lateral moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from sandstone, siltstone, and shale

Typical profile

H1 - 0 to 6 inches: gravelly silt loam
H2 - 6 to 27 inches: gravelly silt loam
H3 - 27 to 48 inches: gravelly loam
H4 - 48 to 72 inches: very gravelly sandy loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 2 percent
Available water storage in profile: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Castile

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

Chadakoin

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

Chenango

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

Mardin

Percent of map unit: 5 percent

Hydric soil rating: No

52E—Valois gravelly silt loam, 25 to 35 percent slopes

Map Unit Setting

National map unit symbol: 9qd2
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Valois

Setting

Landform: Valley sides, lateral moraines, end moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from sandstone, siltstone, and shale

Typical profile

H1 - 0 to 6 inches: gravelly silt loam
H2 - 6 to 27 inches: gravelly silt loam
H3 - 27 to 48 inches: gravelly loam
H4 - 48 to 72 inches: very gravelly sandy loam

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 2 percent
Available water storage in profile: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

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

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

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

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

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

52F—Valois gravelly silt loam, 35 to 50 percent slopes

Map Unit Setting
National map unit symbol: 9qd3
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Not prime farmland

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

Description of Valois

Setting
Landform: End moraines, valley sides, lateral moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from sandstone, siltstone, and shale

Typical profile
H1 - 0 to 6 inches: gravelly silt loam
H2 - 6 to 27 inches: gravelly silt loam
H3 - 27 to 48 inches: gravelly loam

H4 - 48 to 72 inches: very gravelly sandy loam

Properties and qualities

Slope: 35 to 50 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 2 percent
Available water storage in profile: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Chadakoin

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

Chautauqua

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

Chenango

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

Castile

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

Udifluvents

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

55B—Darien silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9qd8
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Darien and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Darien

Setting

Landform: Till plains, drumlinoid ridges, hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till derived predominantly from calcareous gray shale

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 14 inches: silt loam
H3 - 14 to 38 inches: silty clay loam
H4 - 38 to 72 inches: gravelly silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
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 storage in profile: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Ashville

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

Erie

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

Fremont

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

Busti

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed soils

Percent of map unit: 2 percent
Hydric soil rating: No

56B—Chautauqua silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2vzpq
Elevation: 590 to 1,970 feet
Mean annual precipitation: 33 to 52 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Chautauqua

Setting

Landform: Hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Till

Typical profile

Ap - 0 to 8 inches: silt loam
Bw1 - 8 to 22 inches: silt loam
Bw2 - 22 to 35 inches: gravelly silt loam
C - 35 to 72 inches: gravelly loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Busti
Percent of map unit: 8 percent
Landform: Hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Langford
Percent of map unit: 7 percent
Landform: Hills, drumlinoid ridges, till plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Chadakoin
Percent of map unit: 5 percent
Landform: Hills, drumlinoid ridges, till plains
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

56C—Chautauqua silt loam, 8 to 15 percent slopes

Map Unit Setting
National map unit symbol: 2vzpr
Elevation: 590 to 1,970 feet
Mean annual precipitation: 33 to 52 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Farmland of statewide importance

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

Description of Chautauqua

Setting
Landform: Hills

Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

Ap - 0 to 8 inches: silt loam
Bw1 - 8 to 22 inches: silt loam
Bw2 - 22 to 35 inches: gravelly silt loam
C - 35 to 72 inches: gravelly loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Chadakoin

Percent of map unit: 8 percent
Landform: Hills, drumlinoid ridges, till plains
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Interfluve, side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Langford

Percent of map unit: 7 percent
Landform: Hills, drumlinoid ridges, till plains
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Interfluve, side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Busti

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve
Down-slope shape: Concave
Across-slope shape: Linear

Hydric soil rating: No

57B—Busti silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2vzpw
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 215 days
Farmland classification: Prime farmland if drained

Map Unit Composition

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

Description of Busti

Setting

Landform: Hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Till

Typical profile

Ap - 0 to 8 inches: silt loam
Bw1 - 8 to 17 inches: silt loam
Bw2 - 17 to 25 inches: silt loam
BC - 25 to 33 inches: gravelly silt loam
C - 33 to 72 inches: gravelly silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Ashville
Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Volusia
Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Chautauqua
Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Fremont
Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

59B—Yorkshire channery silt loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 9qdl
Elevation: 1,800 to 2,200 feet
Mean annual precipitation: 35 to 48 inches
Mean annual air temperature: 41 to 45 degrees F
Frost-free period: 90 to 125 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Yorkshire and similar soils: 85 percent

Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Yorkshire

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy till derived mainly from siltstone, shale, and sandstone

Typical profile

H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 19 inches: channery silt loam
H3 - 19 to 56 inches: channery silty clay loam
H4 - 56 to 72 inches: channery silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 16 to 30 inches to fragipan
Natural drainage class: Moderately well drained
Runoff class: Very high
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 14 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Napoli

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

Willdin

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

Salamanca

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

Unnamed soils

Percent of map unit: 2 percent
Hydric soil rating: No

Ischua

Percent of map unit: 2 percent
Hydric soil rating: No

59C—Yorkshire channery silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9qdm
Elevation: 1,800 to 2,200 feet
Mean annual precipitation: 35 to 48 inches
Mean annual air temperature: 41 to 45 degrees F
Frost-free period: 90 to 125 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Yorkshire and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Yorkshire

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy till derived mainly from siltstone, shale, and sandstone

Typical profile

H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 19 inches: channery silt loam
H3 - 19 to 56 inches: channery silty clay loam
H4 - 56 to 72 inches: channery silt loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 16 to 30 inches to fragipan
Natural drainage class: Moderately well drained
Runoff class: Very high
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 14 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

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

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

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

Ischua
Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed soils
Percent of map unit: 2 percent
Hydric soil rating: No

60B—Napoli silt loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 9qdr
Elevation: 1,800 to 2,200 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 41 to 45 degrees F
Frost-free period: 90 to 125 days
Farmland classification: Farmland of statewide importance

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

Description of Napoli

Setting
Landform: Ridges, hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till derived from siltstone, shale, and sandstone

Typical profile
H1 - 0 to 9 inches: silt loam
H2 - 9 to 23 inches: silty clay loam
H3 - 23 to 46 inches: channery silty clay loam

H4 - 46 to 72 inches: channery silty clay loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 12 to 27 inches to fragipan
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Almond

Percent of map unit: 8 percent
Hydric soil rating: No

Unnamed soils

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

Gretor

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

61B—Schuyler silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2wn1z
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Schuyler and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Schuyler

Setting

Landform: Hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Till

Typical profile

Ap - 0 to 7 inches: silt loam
Bw1 - 7 to 15 inches: silt loam
Bw2 - 15 to 38 inches: channery silty clay loam
C - 38 to 72 inches: channery silty clay loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 16 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Towerville

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Crest, nose slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Mardin

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Fremont

Percent of map unit: 5 percent
Landform: Hills

Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

61C—Schuyler silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2wn20
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Schuyler and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Schuyler

Setting

Landform: Hills
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Till

Typical profile

Ap - 0 to 7 inches: silt loam
Bw1 - 7 to 15 inches: silt loam
Bw2 - 15 to 38 inches: channery silty clay loam
C - 38 to 72 inches: channery silty clay loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 16 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Towerville
Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, nose slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Mardin
Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Fremont
Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

61D—Schuyler silt loam, 15 to 25 percent slopes

Map Unit Setting
National map unit symbol: 2wn21
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition
Schuyler and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Schuyler

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Head slope, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Till

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 4 inches: silt loam
BE - 4 to 7 inches: silt loam
Bw1 - 7 to 15 inches: silt loam
Bw2 - 15 to 38 inches: channery silty clay loam
C - 38 to 72 inches: channery silty clay loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 16 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Towerville

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, nose slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Mardin

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, head slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Fremont

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

61E—Schuyler silt loam, 25 to 35 percent slopes

Map Unit Setting

National map unit symbol: 2wn23
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Schuyler and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Schuyler

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Head slope, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Till

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 4 inches: silt loam
BE - 4 to 7 inches: silt loam
Bw1 - 7 to 15 inches: silt loam
Bw2 - 15 to 38 inches: channery silty clay loam
C - 38 to 72 inches: channery silty clay loam

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 16 to 24 inches
Frequency of flooding: None

Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Towerville

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

63B—Langford channery silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9qf4
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Langford and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Langford

Setting

Landform: Drumlinoid ridges, hills, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived from siltstone, sandstone, shale, and some limestone

Typical profile

H1 - 0 to 7 inches: channery silt loam
H2 - 7 to 25 inches: silt loam
H3 - 25 to 44 inches: gravelly silt loam

H4 - 44 to 72 inches: gravelly silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 15 to 28 inches to fragipan
Natural drainage class: Moderately well drained
Runoff class: High
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: About 14 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Unnamed soils

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

Chautauqua

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

Erie

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

Schuyler

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

63C—Langford channery silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9qf5
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Langford and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Langford

Setting

Landform: Drumlinoid ridges, hills, till plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived from siltstone, sandstone, shale, and some limestone

Typical profile

H1 - 0 to 7 inches: channery silt loam
H2 - 7 to 25 inches: silt loam
H3 - 25 to 44 inches: gravelly silt loam
H4 - 44 to 72 inches: gravelly silt loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 15 to 28 inches to fragipan
Natural drainage class: Moderately well drained
Runoff class: High
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: About 14 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Chautauqua

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

Erie

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

Unnamed soils

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

Schuyler

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

69C—Erie channery silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2wn36
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Erie

Setting

Landform: Hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Till

Typical profile

Ap - 0 to 9 inches: channery silt loam
E - 9 to 13 inches: channery silt loam
Bg - 13 to 15 inches: channery silt loam
Bx - 15 to 38 inches: channery silt loam
C - 38 to 72 inches: channery loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 10 to 21 inches to fragipan
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.14 in/hr)
Depth to water table: About 7 to 14 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D

Hydric soil rating: No

Minor Components

Langford

Percent of map unit: 10 percent
Landform: Drumlinoid ridges, hills, till plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, head slope
Down-slope shape: Convex, concave
Across-slope shape: Convex, linear
Hydric soil rating: No

Chippewa

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Fremont

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

72C—Towerville silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9qfv
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Towerville

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Summit

Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy till derived mainly from shale, siltstone, and smaller amounts of sandstone

Typical profile
H1 - 0 to 7 inches: silt loam
H2 - 7 to 23 inches: silt loam
H3 - 23 to 32 inches: channery silty clay loam
H4 - 32 to 42 inches: weathered bedrock

Properties and qualities
Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.8 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Schuyler
Percent of map unit: 8 percent
Hydric soil rating: No

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

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

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

72D—Towerville silt loam, 15 to 25 percent slopes

Map Unit Setting
National map unit symbol: 9qfw

Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Towerville

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy till derived mainly from shale, siltstone, and smaller amounts of sandstone

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 23 inches: silt loam
H3 - 23 to 32 inches: channery silty clay loam
H4 - 32 to 42 inches: weathered bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Schuyler

Percent of map unit: 8 percent
Hydric soil rating: No

Hornell

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

Orpark

Percent of map unit: 4 percent

Hydric soil rating: No

Unnamed soils

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

73C—Gretor channery silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: bpc0
Elevation: 1,800 to 2,200 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 41 to 45 degrees F
Frost-free period: 90 to 125 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Gretor

Setting

Landform: Hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till derived from sandstone, siltstone, and shale

Typical profile

H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 21 inches: channery silt loam
H3 - 21 to 25 inches: channery silty clay loam
H4 - 25 to 29 inches: unweathered bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
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: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Unnamed soils
Percent of map unit: 6 percent
Landform: Depressions
Hydric soil rating: Yes

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

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

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

78C—Hornell silt loam, 8 to 15 percent slopes

Map Unit Setting
National map unit symbol: 9qg9
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Farmland of statewide importance

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

Description of Hornell

Setting
Landform: Benches, ridges, till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey till, or till and residuum, derived from acid shale and siltstone

Typical profile
H1 - 0 to 8 inches: silt loam
H2 - 8 to 28 inches: silty clay

H3 - 28 to 34 inches: channery silty clay loam
H4 - 34 to 44 inches: unweathered bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Unnamed soils

Percent of map unit: 9 percent
Landform: Depressions
Hydric soil rating: Yes

Fremont

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

Towerville

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

Orpark

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

78D—Hornell silt loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9qgb
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Hornell and similar soils: 80 percent

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

Description of Hornell

Setting

Landform: Benches, ridges, till plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey till, or till and residuum, derived from acid shale and siltstone

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 28 inches: silty clay
H3 - 28 to 34 inches: channery silty clay loam
H4 - 34 to 44 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Unnamed soils

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

Schuyler

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

Towerville

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

Orpark

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

Hudson

Percent of map unit: 3 percent

Hydric soil rating: No

80A—Fremont silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2vzr6
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

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

Description of Fremont

Setting

Landform: Hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Till

Typical profile

Ap - 0 to 8 inches: silt loam
Bw1 - 8 to 16 inches: silt loam
Bw2 - 16 to 30 inches: channery silt loam
BC - 30 to 34 inches: channery silty clay loam
C - 34 to 72 inches: channery silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Ashville

Percent of map unit: 8 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Volusia

Percent of map unit: 7 percent
Landform: Mountains, hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Orpark

Percent of map unit: 5 percent
Landform: Benches, till plains, ridges
Landform position (two-dimensional): Footslope, summit, shoulder
Landform position (three-dimensional): Base slope, interfluve, crest
Down-slope shape: Concave, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

80B—Fremont silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2vzrc
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Fremont

Setting

Landform: Hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve

Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Till

Typical profile

Ap - 0 to 8 inches: silt loam
Bw1 - 8 to 16 inches: silt loam
Bw2 - 16 to 30 inches: channery silt loam
BC - 30 to 34 inches: channery silty clay loam
C - 34 to 72 inches: channery silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Schuyler

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Volusia

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Orpark

Percent of map unit: 5 percent
Landform: Till plains, ridges, benches
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Crest, nose slope, base slope
Down-slope shape: Convex, concave
Across-slope shape: Linear
Hydric soil rating: No

Ashville

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

80C—Fremont silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2vzrh
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Fremont

Setting

Landform: Hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Till

Typical profile

Ap - 0 to 8 inches: silt loam
Bw1 - 8 to 16 inches: silt loam
Bw2 - 16 to 30 inches: channery silt loam
BC - 30 to 34 inches: channery silty clay loam
C - 34 to 72 inches: channery silt loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None

Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Schuyler

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Head slope, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Orpark

Percent of map unit: 5 percent
Landform: Till plains, ridges, benches
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Nose slope, side slope, base slope
Down-slope shape: Linear, concave
Across-slope shape: Linear
Hydric soil rating: No

Ashville

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Volusia

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

81B—Varysburg gravelly silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9qgs

Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Varysburg and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Varysburg

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 5 inches: gravelly silt loam
H2 - 5 to 22 inches: gravelly loam
H3 - 22 to 33 inches: very gravelly loam
H4 - 33 to 48 inches: silty clay loam
H5 - 48 to 72 inches: stratified silty clay to silt to clay

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 18 to 33 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Unnamed soils

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

Chenango

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

Valois

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

Hudson

Percent of map unit: 2 percent
Hydric soil rating: No

81C—Varysburg gravelly silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9qgt
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Varysburg and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Varysburg

Setting

Landform: Lake plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 5 inches: gravelly silt loam
H2 - 5 to 22 inches: gravelly loam
H3 - 22 to 33 inches: very gravelly loam
H4 - 33 to 48 inches: silty clay loam
H5 - 48 to 72 inches: stratified silty clay to silt to clay

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 18 to 33 inches
Frequency of flooding: None

Frequency of ponding: None
Available water storage in profile: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Unnamed soils

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

Chenango

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

Valois

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

Hudson

Percent of map unit: 2 percent
Hydric soil rating: No

81D—Varysburg gravelly silt loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9qgv
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Varysburg and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Varysburg

Setting

Landform: Lake plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 5 inches: gravelly silt loam
H2 - 5 to 22 inches: gravelly loam
H3 - 22 to 33 inches: very gravelly loam
H4 - 33 to 48 inches: silty clay loam
H5 - 48 to 72 inches: stratified silty clay to silt to clay

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 18 to 33 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Unnamed soils

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

Chenango

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

Hudson

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

Valois

Percent of map unit: 2 percent
Hydric soil rating: No

82F—Rock outcrop-Manlius complex, 35 to 70 percent slopes

Map Unit Setting

National map unit symbol: 9qh1
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days

Farmland classification: Not prime farmland

Map Unit Composition

Rock outcrop: 50 percent
Manlius and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rock Outcrop

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 35 to 70 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydric soil rating: Unranked

Description of Manlius

Setting

Landform: Benches, ridges, till plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from local acid shale bedrock

Typical profile

H1 - 0 to 4 inches: channery silt loam
H2 - 4 to 23 inches: very channery silt loam
H3 - 23 to 34 inches: very channery silt loam
H4 - 34 to 44 inches: unweathered bedrock

Properties and qualities

Slope: 35 to 70 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Unnamed soils
Percent of map unit: 10 percent
Hydric soil rating: No

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

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

135C—Hudson silt loam, 8 to 15 percent slopes

Map Unit Setting
National map unit symbol: 9q8n
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Hudson and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hudson

Setting
Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile
H1 - 0 to 7 inches: silt loam
H2 - 7 to 16 inches: silty clay loam
H3 - 16 to 38 inches: silty clay
H4 - 38 to 72 inches: stratified silty clay to silty clay loam to silt

Properties and qualities
Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: High

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 16 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 20 percent
Available water storage in profile: High (about 9.5 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

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

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

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

135D—Hudson silt loam, 15 to 25 percent slopes

Map Unit Setting
National map unit symbol: 9q8p
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition
Hudson and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hudson

Setting
Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Riser
Down-slope shape: Concave
Across-slope shape: Convex

Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 16 inches: silty clay loam
H3 - 16 to 38 inches: silty clay
H4 - 38 to 72 inches: stratified silty clay to silty clay loam to silt

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Very high
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 16 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 20 percent
Available water storage in profile: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Rhinebeck

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

Collamer

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

Dunkirk

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

135E—Hudson silt loam, 25 to 35 percent slope

Map Unit Setting

National map unit symbol: 9q8q
Elevation: 600 to 1,800 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Hudson and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hudson

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Riser
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 16 inches: silty clay loam
H3 - 16 to 38 inches: silty clay
H4 - 38 to 72 inches: stratified silty clay to silty clay loam to silt

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Very high
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 16 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 20 percent
Available water storage in profile: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Collamer

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

Dunkirk

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

Rhinebeck

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

PG—Pits, gravel

Map Unit Setting

National map unit symbol: 9qjf
Elevation: 600 to 2,200 feet
Mean annual precipitation: 39 to 48 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 105 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Pits, gravel: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Minor Components

Chenango

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

Udorthents

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

Valois

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

Halsey

Percent of map unit: 3 percent
Landform: Depressions
Hydric soil rating: Yes

W—Water

Map Unit Setting

National map unit symbol: 9qjh
Elevation: 600 to 2,450 feet
Farmland classification: Not prime farmland

Map Unit Composition

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

Erie County, New York

W—Water

Map Unit Setting

National map unit symbol: 9rr2
Mean annual precipitation: 36 to 48 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Not prime farmland

Map Unit Composition

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

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SJB SERVICES, INC.

Contract Drilling and Testing

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January 30, 2015

Nussbaumer and Clarke
3556 Lakeshore Road
Suite 500
Buffalo, New York 14219

Attention: Ms. Melanie Stein EIT
Reference: Soil Borings
West Valley Water System Improvements

Dear Melanie,

On December 18th , 19th and 24th , 2014 an SJB Services Inc. drill rig and crew were present at various locations in the hamlet of West Valley, New York to perform a total of sixteen (16) soil test borings along the proposed alignment of new water mains and future water storage facility.

Both a Central Mine Equipment CME-75 truck mounted and CME –850 track mounted rotary drill rigs were utilized at the sites to advance the test borings. Soil sampling was performed in accordance with ASTM D-1586 ***"Standard Test Method for Penetration Test and Split Barrel Sampling of Soils".*** The test borings were completed at the locations selected during a site visit by SJB and Nussbaumer personnel prior to drilling and are indicated on the attached boring location summary.

Attached please find the final typed boring logs for the proposed water system improvements. These logs are based on the field data recorded by the drill foreman and visual classification of the recovered soils samples by a staff geologist.

We appreciated the opportunity to perform this work for you. If you have any further questions, please contact the undersigned at our Buffalo, New York office.

Respectfully Submitted,
SJB SERVICES INC.

Frank R. Minnolera Jr. (SJB)

Frank R. Minnolera Jr.
Staff Geologist

TEST BORING LOCATION SUMMARY
WEST VALLEY WATER SYSTEM

BORING NUMBER	STREET LOCATION	UFPO TICKET #
B-1	Across from 9152 Rt. 240	12094-078-004
B-2	Rt. 240 at Ashford Hollow Road – SW Corner of intersection	12094-078-005
B-3	Front of 9269 White Street	12094-078-006
B-4	Front of 9346 Rt. 240	12094-078-007
B-5	School St. at Depot Street SE corner of intersection	12094-078-008
B-6	Front of 9418 Rt. 240	12094-078-009
B-7	Front of 5456 Pinecliff Drive	12094-078-010
B-8	Across from 9487 Rt. 240	12094-078-011
B-9	Across from 5379 Felton Hill Road	12094-078-012
B-10	Front of 9579 Rt. 240	12094-078-013
B-11	East of 5360 Williams Ave.	12094-078-014
B-12	South of 9636 Rt. 240	12094-078-015
B-13	Front of 5391 Hillview Dr.	12094-078-016
B-14	Front of 9728 Rt. 240	12094-078-017
B-15	North of 9780 Rt. 240	12094-078-018
B-16	Depot Street – up in woods At dead end past bridge	12094-078-019

BORING LOGS

GENERAL INFORMATION & KEY TO SUBSURFACE LOGS

The Subsurface Logs attached to this report present the observations and mechanical data collected by the driller at the site, supplemented by classification of the material removed from the borings as determined through visual identification by technicians in the laboratory. It is cautioned that the materials removed from the borings represent only a fraction of the total volume of the deposits at the site and may not necessarily be representative of the subsurface condition between adjacent borings or between the sampled intervals. The data presented of the Subsurface Logs together with the recovered samples provide a basis for evaluating the character of the subsurface conditions relative to the project. The evaluation must consider all the recorded details and their procedures to more accurately evaluate the subsurface conditions. Any evaluation of the contents of this report and recovered samples must be performed by qualified professionals. The following information defines some of the procedures and terms used of the Subsurface Logs to describe the conditions encountered, consistent with the numbered identifiers shown on the Key opposite this page.

1. **The figures in the Depth column define the scale of the Subsurface Log.**
2. **The Samples column shows, graphically, the depth range from which a sample was recovered. See Table I for descriptions of the symbols used to represent the various types of samples.**
3. **The Sample No. is used for identification on sample containers and/or Laboratory Test Reports.**
4. **Blows on Sampler – shows the results of the "Penetration Test", recording the number of blows required to drive a split spoon sampler into the soil. The number of blows required for each six inches is recorded. The first 6 inches of penetration is considered a seating drive. The number of blows required for the second and third 6 inches of penetration is termed the penetration resistance, N.**
5. **Blows on Casing – Shows the number of blows required to advance the casing a distance of 12 inches. The casing size, hammer weight, and length of drop are noted at the bottom of the Subsurface Log. If the casing is advanced by means other than driving, the method of advancement will be indicated in the Notes column or under the Method of Investigation at the bottom of the Subsurface Log. Alternatively, sample recovery may be shown in this column or other data consistent with the column heading.**
6. **All recovered soil samples are reviewed in the laboratory by an engineering technician, geologist, or geotechnical engineer, unless noted otherwise. Visual descriptions are made on the basis of a combination of the driller's field descriptions and noted observations together with the sample as received in the laboratory. The method of visual classification is based primarily on the Unified Soil Classification System (ASTM D 2487) with regard to the particle size and plasticity (See Table No. II), and the Unified Soil Classification System group symbols for the soil types are sometimes included with the soil classification. Additionally, the relative portion, by weight, of two or more soil types is described for granular soils in accordance with "Suggested Methods of Test for Identification of Soils" by D.M. Burmister, ASTM Special Technical Publication 479, June 1970. (See Table No. III). Description of the relative soil density or consistency is based upon the penetration records as defined in Table No. IV. The description of the soil moisture is based upon the relative wetness of the soil as recovered and is described as dry, moist, wet, and saturated. Water introduced into the boring either naturally or during drilling may have affected the moisture condition of the recovered sample. Special terms are used as required to describe soil deposition in greater detail; several such terms are listed in Table V. When sampling gravelly soils with a standard two inch diameter split spoon, the true percentage of gravel is often not recovered due to the relatively small sampler diameter. The presence of boulders and large gravel is sometimes, but not necessarily, detected by an evaluation of the casing and sampler blows or through the "action" of the drill rig as reported by the driller.**
7. **Rock description is based on review of the recovered rock core and the driller's notes. Frequently used rock classification terms are included in Table VI.**
8. **The stratification lines represent the approximate boundary between soil types and the transition may be gradual. Solid stratification lines delineate apparent changes in soil type, based upon review of recovered soil samples and the driller's notes. Dashed lines convey a lesser degree of certainty with respect to either a change in soil type or where such change may occur.**
9. **Miscellaneous observations and procedures noted by the driller are shown in this column, including water level observations. It is important to realize the reliability of the water level observations depends upon the soil type (water does not readily stabilize in a hole through fine grained soils), and that any drill water used to advance the boring may have influenced the observations. The ground water level will fluctuate seasonally, typically. One or more perched or trapped water levels may exist in the ground seasonally. All the available readings should be evaluated. If definite conclusions cannot be made, it is often prudent to examine the conditions more thoroughly through test pit excavations or groundwater observation wells.**
10. **The length of core run is defined as the length of penetration of the core barrel. Core recovery is the length of core recovered divided by the core run. The RQD (Rock Quality Designation) is the total length of pieces of NX core exceeding 4 inches divided by the core run. The size core barrel used is also noted in the Method of Investigation at the bottom of the Subsurface Log.**

DATE

STARTED _____

FINISHED _____

SHEET _____ OF _____

SJB SERVICES, INC.
SUBSURFACE LOG

PROJ. No. _____

HOLE No. _____

SURF. ELEV. _____

G.W. DEPTH _____

PROJECT _____ LOCATION _____

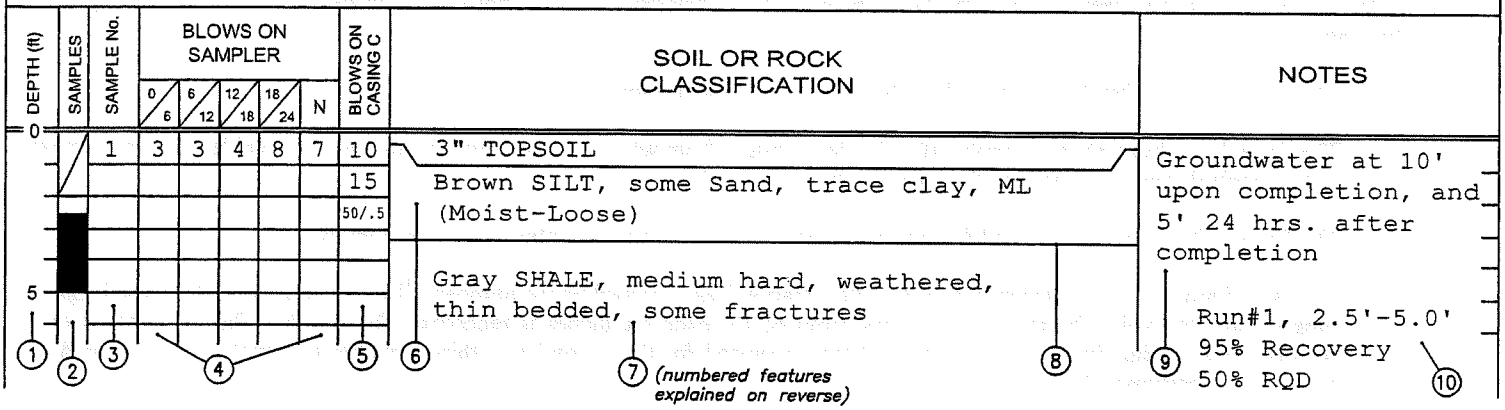

TABLE I

- Split Spoon Sample
- Shelby Tube Sample
- Geoprobe Macro-Core
- Auger or Test Pit Sample
- Rock Core

TABLE II

Identification of soil type is made on basis of an estimate of particle sizes, and in the case of fine grained soils also on basis of plasticity.

Soil Type	Soil Particle Size	
Boulder	>12"	Coarse Grained (Granular)
Cobble	3" - 12"	
Gravel - Coarse	3" - 3/4"	
- Fine	3/4" - #4	
Sand - Coarse	#4 - #10	
- Medium	#10 - #40	
- Fine	#40 - #200	
Silt - Non Plastic (Granular)	<#200	Fine Grained
Clay - Plastic (Cohesive)		

TABLE III

The following terms are used in classifying soils consisting of mixtures of two or more soil types. The estimate is based on weight of total sample.

Term	Percent of Total Sample
"and"	35 - 50
"some"	20 - 35
"little"	10 - 20
"trace"	less than 10

(When sampling gravelly soils with a standard split spoon, the true percentage of gravel is often not recovered due to the relatively small sampler diameter.)

TABLE IV

The relative compactness or consistency is described in accordance with the following terms:

Granular Soils		Cohesive Soils	
Term	Blows per Foot, N	Term	Blows per Foot, N
Loose	0 - 4	Very Soft	0 - 2
Loose	4 - 10	Soft	2 - 4
Firm	10 - 30	Medium	4 - 8
Compact	30 - 50	Stiff	8 - 15
Very Compact	>50	Very Stiff	15 - 30
		Hard	>30

(Large particles in the soils will often significantly influence the blows per foot recorded during the penetration test)

TABLE V

Varved	Horizontal uniform layers or seams of soil(s).
Layer	Soil deposit more than 6" thick.
Seam	Soil deposit less than 6" thick.
Parting	Soil deposit less than 1/8" thick.
Laminated	Irregular, horizontal and angled seams and partings of soil(s).

TABLE VI

Rock Classification Term		Meaning
Hardness	- Soft	Scratched by fingernail
	- Medium Hard	Scratched easily by penknife
	- Hard	Scratched with difficulty by penknife
	- Very Hard	Cannot be scratched by penknife
Weathering	- Very Weathered	Judged from the relative amounts of disintegration, iron staining, core recovery, clay seams, etc.
	- Weathered	
	- Sound	

Rock Classification Term		Meaning	
Bedding	- Laminated	(<1")	Natural breaks in Rock Layers
	- Thin Bedded	(1" - 4")	
	- Bedded	(4" - 12")	
	- Thick Bedded	(12" - 36")	
	- Massive	(>36")	

(Fracturing refers to natural breaks in the rock oriented at some angle to the rock layers)

DATE
START 12/18/2014
FINISH 12/18/2014
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-1
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WATER SYSTEM IMPROVEMENTS LOCATION: ACROSS FROM 9152 RT 240
PROJ. NO.: BD-14-184 WEST VALLEY, NY

DEPTH FT.		SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
			AUGER				ASPHALTIC CONCRETE	Driller notes approx. 10.5" Asphalt
		1	31	10			Brown-Olive f-c GRAVEL and f-c Sand, little-some Silt (moist, FILL)	
		2	10	8			Brown fine SAND, some Silt, tr.gravel (moist, firm, SM)	
			5	3		13		
5		3	12	10			Brown-Gray f-c SAND, some f-c Gravel, some Silt (moist-wet, firm, SM)	
			4	6		14		
		4	7	7				
			6	6		13		
		5	8	11				
10			17	15		28		
							Boring Complete at 10.0'	Free Standing Water recorded at 8.5' at Boring Completion
15								
20								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: J. FRIDMAN DRILL RIG TYPE : CME-75

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 12/18/2014
FINISH 12/18/2014
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-2
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WATER SYSTEM IMPROVEMENTS
PROJ. NO.: BD-14-184
LOCATION: RT 240 AT ASHFORD HOLLOW RD
SW CORNER OF INTERSECTION

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
	1	2	5			TOPSOIL Black-Brown f-c GRAVEL and f-c Sand, little Silt (moist, FILL)	Driller notes approx. 2" Topsoil
		7	3		12		
	2	7	6			Brown f-c GRAVEL and f-c Sand, little-some Silt (moist, firm, GM)	
		5	11		11		
5	3	10	9				
		8	11		17	(wet)	
	4	10	10				
		7	5		17		
	5	5	5				
10		8	8		13	Gray Clayey SILT, tr.sand (wet, ML)	
						Boring Complete at 10.0'	Free Standing Water recorded at grade at Boring Completion
15							
20							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: J. FRIDMAN

DRILL RIG TYPE : CME-75

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 12/18/2014
FINISH 12/18/2014
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-3
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WATER SYSTEM IMPROVEMENTS
PROJ. NO.: BD-14-184
LOCATION: FRONT OF 9269 WHITE ST
WEST VALLEY, NY

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
	1	8	16	20	36	TOPSOIL Brown f-c GRAVEL and f-c Sand, little-some Silt (moist, FILL)	Driller notes approx. 4" Topsoil
	2	16	10			Gray fine SAND, some Silt (moist, firm, SM)	
		8	7		18		
5	3	5	2			(v.loose)	
		2	3		4		
	4	3	4			Olive-Gray and Black Silty CLAY, tr.sand, tr.organics (moist-wet, medium, CL)	
		4	9		8		
	5	9	9			Olive-Gray f-c SAND, some f-c Gravel, little-some Silt (wet, firm, SM)	
10		9	10		18		
						Boring Complete at 10.0'	No Free Standing Water encountered at Boring Completion
15							
20							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: J. FRIDMAN

DRILL RIG TYPE : CME-75

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 12/19/2014
FINISH 12/19/2014
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-4
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WATER SYSTEM IMPROVEMENTS LOCATION: FRONT OF 9346 RT 240
PROJ. NO.: BD-14-184 WEST VALLEY, NY

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
	1	23	12	10	22	ASPHALT-CONCRETE Black and Gray f-c SAND, some Silt, little f-c Gravel (moist, FILL)	Driller notes approx. 3" Asphalt
	2	7	15				
		7	10		22		
5	3	8	9				
		10	18		19		
	4	12	10				
		12	13		22	Brown f-c SAND, some Silt, some f-c Gravel (moist-wet, firm, SM)	
	5	12	13				
10		12	14		25	(wet)	
						Boring Complete at 10.0'	Free Standing Water recorded at 5.0' at Boring Completion
15							
20							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: J. FRIDMAN DRILL RIG TYPE : CME-75

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 12/18/2014
FINISH 12/18/2014
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-5
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WATER SYSTEM IMPROVEMENTS
PROJ. NO.: BD-14-184
LOCATION: SCHOOL ST AT DEPOT ST
SE CORNER OF INTERSECTION

DEPTH FT.		SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N		SOIL OR ROCK CLASSIFICATION	NOTES
		1	2	2				TOPSOIL Brown-Black SILT, little fine Sand (moist, v.loose, ML)	Driller notes approx. 2" Topsoil
			2	2		4			
		2	3	2				Olive-Gray Silty CLAY, tr.sand, tr.organics (moist, medium, CL)	
			3	3		5			
5		3	4	6				Brown f-c SAND and Silt, tr.gravel (wet, loose, SM)	
			4	4		10			
		4	3	3				Gray-Black SILT, tr.sand, occasional f-c Sand lenses (wet, loose, ML)	
			4	3		7			
		5	4	6				Brown f-c SAND, some f-c Gravel, some Silt (wet, firm, SM)	
10			5	4		11			
								Boring Complete at 10.0'	Free Standing Water recorded at 4.0' at Boring Completion
15									
20									

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: J. FRIDMAN

DRILL RIG TYPE : CME-75

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 12/19/2014
FINISH 12/19/2014
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-6
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WATER SYSTEM IMPROVEMENTS
PROJ. NO.: BD-14-184
LOCATION: FRONT OF 9418 RT 240
WEST VALLEY, NY

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
						ASPHALTIC CONCRETE	Driller notes approx. 5.5" Asphalt
	1	21	32	33	55	Black and Brown f-c SAND, some f-c Gravel, little-some Silt (moist, FILL)	
	2	8	5				No Recovery Sample #2
		9	16		14		
5	3	13	14			Brown f-c SAND, some f-c Gravel, some Silt (moist, firm, SM)	
		13	14		27		
	4	16	8				
		9	7		17		
	5	9	7			(moist-wet)	
10		6	11		13		
						Boring Complete at 10.0'	No Free Standing Water encountered at Boring Completion
15							
20							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: J. FRIDMAN

DRILL RIG TYPE : CME-75

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 12/18/2014
FINISH 12/18/2014
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-7
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WATER SYSTEM IMPROVEMENTS
PROJ. NO.: BD-14-184
LOCATION: FRONT OF 5456 PINECLIFF DR
WEST VALLEY, NY

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
						ASPHALTIC CONCRETE	Driller notes approx. 6" Asphalt
	1	10	15	9	24	Red-Brown f-c SAND and f-c Gravel, little Silt (moist, FILL)	
	2	9	8			Brown f-c GRAVEL and f-c Sand, little-some Silt (moist, firm, GM)	
		8	7		16		
5	3	10	7				Poor Recovery Sample #3
		11	13		18		
	4	10	10				
		15	11		25		
	5	15	20				
10		23	21		43	(compact)	
						Boring Complete at 10.0'	No Free Standing Water encountered at Boring Completion
15							
20							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: J. FRIDMAN

DRILL RIG TYPE : CME-75

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 12/19/2014
FINISH 12/19/2014
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-8
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WATER SYSTEM IMPROVEMENTS LOCATION: ACROSS FROM 9487 RT 240
PROJ. NO.: BD-14-184 WEST VALLEY, NY

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
	1	15	20	23	43	ASPHALTIC CONCRETE Brown-Black f-c GRAVEL and f-c Sand, little-some Silt (moist, FILL)	Driller notes approx. 6" Asphalt
	2	15	14				
		13	11		27		
5	3	5	4				
		5	5		9		
	4	5	6			Gray Clayey SILT, tr.-little f-c Sand (moist-wet, firm, ML)	
		5	5		11		
	5	5	5				
10		6	6		11		
						Boring Complete at 10.0'	No Free Standing Water encountered at Boring Completion
15							
20							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: J. FRIDMAN DRILL RIG TYPE : CME-75

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 12/19/2014
FINISH 12/19/2014
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-9
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WATER SYSTEM IMPROVEMENTS LOCATION: ACROSS FROM 5379 FELTON HILL
PROJ. NO.: BD-14-184 WEST VALLEY, NY

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
	1	15	25	12	37	ASPHALTIC CONCRETE Brown-Black f-c GRAVEL and f-c Sand, little-some Silt, tr.asphalt (moist, FILL)	Driller notes approx. 3.5" Asphalt
	2	10	6			Brown f-c SAND, some f-c Gravel, little Silt (moist, firm, SM)	
		5	5		11		
5	3	3	6				
		5	5		11		
	4	5	7			(moist-wet)	
		4	4		11		
	5	5	3			(loose)	
10		4	6		7		
						Boring Complete at 10.0'	No Free Standing Water encountered at Boring Completion
15							
20							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: J. FRIDMAN DRILL RIG TYPE : CME-75

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 12/19/2014
FINISH 12/19/2014
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-10
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WATER SYSTEM IMPROVEMENTS
PROJ. NO.: BD-14-184
LOCATION: FRONT OF 9579 RT 240
WEST VALLEY, NY

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
						ASPHALTIC CONCRETE	Driller notes approx. 3" Asphalt
	1	10	15	12	27	Black-Brown f-c SAND, little-some Silt, little f-c Gravel (moist, FILL)	
	2	12	12			Olive-Brown f-c GRAVEL and f-c Sand, little-some Silt (moist, firm, GM)	
		10	10		22		
5	3	12	11				
		10	11		21		
	4	12	11			(moist-wet)	
		7	7		18		
	5	8	9				
10		10	10		19	(wet)	
						Boring Complete at 10.0'	Free Standing Water recorded at 8.5' at Boring Completion
15							
20							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: J. FRIDMAN

DRILL RIG TYPE : CME-75

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 12/18/2014
FINISH 12/18/2014
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-11
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WATER SYSTEM IMPROVEMENTS
PROJ. NO.: BD-14-184
LOCATION: EAST OF 5360 WILLIAMS AVE
WEST VALLEY, NY

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
						ASPHALTIC CONCRETE	Driller notes approx. 4" Asphalt
	1	7	7	5	12	Black Clayey SILT, tr.-little f-c Sand (moist, FILL)	
	2	5	9			Brown f-c SAND, some Clayey Silt, some f-c Gravel (moist, firm, SC-SM)	
		8	14		17		
5	3	8	12				
		8	6		20		
	4	15	10			Brown Silty CLAY, little f-c Sand (moist, v.stiff, CL)	
		10	13		20		
	5	13	14			Brown f-c SAND, some Silt, little f-c Gravel (moist-wet, firm, SM)	
10		14	13		28		
						Boring Complete at 10.0'	No Free Standing Water encountered at Boring Completion
15							
20							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: J. FRIDMAN

DRILL RIG TYPE : CME-75

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 12/19/2014
FINISH 12/19/2014
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-12
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WATER SYSTEM IMPROVEMENTS
PROJ. NO.: BD-14-184
LOCATION: SOUTH OF 9636 RT 240
WEST VALLEY, NY

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
	1	7	10			Brown-Black f-c SAND, some Silt, some f-c Gravel (moist, FILL)	
		6	12		16		
	2	3	4				Poor Recovery Sample #2
		6	8		10		
5	3	8	6			Brown f-c GRAVEL and f-c Sand, some Silt (moist, firm, GM)	
		6	7		12		
	4	5	4			Gray-Brown f-c SAND, little Silt, occasioanl Silty Clay seams (wet, loose, SM)	
		5	4		9		
	5	5	6				
10		8	9		14	(firm)	
						Boring Complete at 10.0'	Free Standing Water recorded at 4.0' at Boring Completion
15							
20							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: J. FRIDMAN

DRILL RIG TYPE : CME-75

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 12/18/2014
FINISH 12/18/2014
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-13
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WATER SYSTEM IMPROVEMENTS
PROJ. NO.: BD-14-184
LOCATION: FRONT OF 5391 HILLVIEW DR
WEST VALLEY, NY

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
						ASPHALTIC CONCRETE	Driller notes approx. 2" Asphalt
	1	7	6	4	10	Olive-Gray f-c SAND, some f-c Gravel, some Silt (moist, FILL)	
	2	5	7			Brown Clayey SILT, little f-c Sand (moist, v.stiff, ML)	
		11	12		18		
5	3	9	14				No Recovery Sample #3
		11	12		25		
	4	11	12			Brown Silty CLAY, tr.-little f-c Sand (moist, hard, CL)	
		20	12		32		
	5	12	15				
10		10	11		25	(v.stiff)	
						Boring Complete at 10.0'	No Free Standing Water encountered at Boring Completion
15							
20							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: J. FRIDMAN

DRILL RIG TYPE : CME-75

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 12/19/2014
FINISH 12/19/2014
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-14
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WATER SYSTEM IMPROVEMENTS
PROJ. NO.: BD-14-184
LOCATION: FRONT OF 9728 RT 240
WEST VALLEY, NY

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
	1	12	10			Gray-Black f-c SAND, some Silt (moist, FILL)	
		7	7		17		
	2	6	5				Poor Recovery Sample #2
		7	6		12		
5	3	7	7			Olive-Brown f-c SAND, some Silt, little f-c Gravel (moist-wet, firm, SM)	
		8	9		15		
	4	8	6				
		7	6		13		
	5	8	8			Brown-Gray Silty CLAY, tr.sand (moist, v.stiff, CL)	
10		8	12		16		
						Boring Complete at 10.0'	Free Standing Water recorded at 5.7' at Boring Completion
15							
20							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: J. FRIDMAN

DRILL RIG TYPE : CME-75

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 12/19/2014
FINISH 12/19/2014
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-15
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WATER SYSTEM IMPROVEMENTS LOCATION: NORTH OF 9780 RT 240
PROJ. NO.: BD-14-184 WEST VALLEY, NY

DEPTH FT.		SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N		SOIL OR ROCK CLASSIFICATION	NOTES
		1	13	9				Black f-c SAND, some f-c Gravel, some Silt (moist, FILL)	
			7	6		16			
		2	5	8					
			8	10		16			
5		3	8	10				Brown Clayey SILT, little f-c Sand (moist, v.stiff, ML)	
			14	16		24			
		4	17	19					
			19	17		38		(hard)	
		5	7	9					
10			16	16		25		Becomes Brown-Gray (v.stiff)	
								Boring Complete at 10.0'	No Free Standing Water reading obtained at Boring Completion
15									
20									

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist

DRILLER: J. FRIDMAN DRILL RIG TYPE : CME-75

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
START 12/24/2014
FINISH 12/24/2014
SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG

HOLE NO. B-16
SURF. ELEV
G.W. DEPTH See Notes

PROJECT: WATER SYSTEM IMPROVEMENTS
PROJ. NO.: BD-14-184
LOCATION: DEPOT ST - UP HILL APPROX. 500' FROM RAILROAD BRIDGE

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	SOIL OR ROCK CLASSIFICATION	NOTES
	1	1	1			Brown-Black Clayey SILT, some f-c Sand, some f-c Gravel, tr.organics (moist, v.soft, ML-OL)	
		1	2		2		
	2	3	3			Brown Clayey SILT, little f-c Gravel, little f-c Sand (wet, medium, ML)	
		5	10		8		
5	3	5	10			Yellow-Brown highly Weathered SILTSTONE Rock and Silt (moist)	
		15	16		25		
	4	22	36	50/0.4	REF	Yellow-Brown highly Weathered SHALE Rock (moist)	REF = Sample Spoon Refusal
	5	17	35	50/0.2	REF		NQ '2' Size Rock Core
10						Yellow-Brown and Gray SHALE Rock, soft to medium hard, slightly to moderatley weathered, thinly bedded with occasional Siltstone seams	RUN #1: 9.2' - 14.2' REC = Approx. 50% RQD = 0%
15						Boring Complete at 14.2'	Free Standing Water recorded at 3.1' after Coring
20							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW

CLASSIFIED BY: Geologist

DRILLER: S. WOLKIEWICZ

DRILL RIG TYPE : CME-850

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

Appendix F

Alternative Cost Estimates

Option #1 - Low Pressure Grinder System SD#1

ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT PRICE	ESTIMATED TOTAL
1	Furnish and Install 2-Inch DR-11 HDPE Sewer Main	LF	16,650	$ 20.00	$ 333,000.00
2	Furnish and Install 3-Inch DR-11 HDPE Sewer Main	LF	31,400	$ 22.00	$ 690,800.00
3	Air Relief Valve Complete with Manhole	EA	10	$ 2,500.00	$ 25,000.00
4	Service Lateral Kits	EA	175	$ 800.00	$ 140,000.00
5	Furnish and Install Simplex Grinder Pump Stations	EA	175	$ 7,000.00	$ 1,225,000.00
6	Directional Drilling Services with 1-1/4-Inch HDPE	LF	10,000	$ 20.00	$ 200,000.00
7	Connection to Existing Manhole	EA	0	$ 3,000.00	$ -
8	Rock Excavation	CY	100	$ 75.00	$ 7,500.00
9	Compaction Testing	LS	1	$ 3,000.00	$ 3,000.00
10	Maintenance and Protection of Traffic Including Signs and Flagmen Meeting NYSDOT Requirements	LS	1	$ 78,729.00	$ 78,729.00
11	Mobilization	LS	1	$ 52,486.00	$ 52,486.00

SUBTOTAL =	**$**	**2,755,515.00**
CONTINGENCY (10%) =	$	275,551.50
LEGAL, ENGINEERING, ADMINISTRATION (25%) =	$	688,878.75
TOTAL =	$	3,719,945.25
TOTAL ESTIMATED CONSTRUCTION COST =	**$**	**3,720,000.00**

Option #1 - Low Pressure Grinder System SD#2

ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT PRICE	ESTIMATED TOTAL
1	Furnish and Install 2-Inch DR-11 HDPE Sewer Main	LF	9,465	$ 20.00	$ 189,300.00
2	Furnish and Install 4-Inch DR-11 HDPE Sewer Main	LF	11,950	$ 26.00	$ 310,700.00
3	Air Relief Valve Complete with Manhole	EA	2	$ 2,500.00	$ 5,000.00
4	Service Lateral Kits	EA	250	$ 800.00	$ 200,000.00
5	Furnish and Install Simplex Grinder Pump Stations	EA	250	$ 7,000.00	$ 1,750,000.00
6	Directional Drilling Services with 1-1/4-Inch HDPE	LF	6,250	$ 20.00	$ 125,000.00
7	Connection to Existing Manhole	EA	0	$ 3,000.00	$ -
8	Rock Excavation	CY	200	$ 75.00	$ 15,000.00
9	Compaction Testing	LS	1	$ 3,000.00	$ 3,000.00
10	Maintenance and Protection of Traffic Including Signs and Flagmen Meeting NYSDOT Requirements	LS	1	$ 77,940.00	$ 77,940.00
11	Mobilization	LS	1	$ 51,960.00	$ 51,960.00

SUBTOTAL =	**$**	**2,727,900.00**
CONTINGENCY (10%) =	$	272,790.00
LEGAL, ENGINEERING, ADMINISTRATION (25%) =	$	681,975.00
TOTAL =	$	3,682,665.00
TOTAL ESTIMATED CONSTRUCTION COST =	**$**	**3,682,700.00**

Option #2 - Low Pressure Grinder System (Accounting for Future Expansion) SD#1

ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT PRICE	ESTIMATED TOTAL
1	Furnish and Install 2-Inch DR-11 HDPE Sewer Main	LF	47,810	$ 20.00	$ 956,200.00
2	Furnish and Install 3-Inch DR-11 HDPE Sewer Main	LF	20,400	$ 22.00	$ 448,800.00
3	Furnish and Install 4-Inch DR-11 HDPE Sewer Main	LF	11,000	$ 26.00	$ 286,000.00
4	Air Relief Valve Complete with Manhole	EA	15	$ 2,500.00	$ 37,500.00
5	Service Lateral Kits	EA	212	$ 800.00	$ 169,600.00
6	Furnish and Install Simplex Grinder Pump Stations	EA	212	$ 7,000.00	$ 1,484,000.00
7	Directional Drilling Services with 1-1/4-Inch HDPE	LF	10,000	$ 20.00	$ 200,000.00
8	Connection to Existing Manhole	EA	0	$ 3,000.00	$ -
9	Rock Excavation	CY	100	$ 75.00	$ 7,500.00
10	Compaction Testing	LS	1	$ 3,000.00	$ 3,000.00
11	Maintenance and Protection of Traffic Including Signs and Flagmen Meeting NYSDOT Requirements	LS	1	$ 107,778.00	$ 107,778.00
12	Mobilization	LS	1	$ 71,852.00	$ 71,852.00

SUBTOTAL =	**$**	**3,772,230.00**
CONTINGENCY (10%) =	$	377,223.00
LEGAL, ENGINEERING, ADMINISTRATION (25%) =	$	943,057.50
TOTAL =	$	5,092,510.50
TOTAL ESTIMATED CONSTRUCTION COST =	**$**	**5,092,600.00**

Option #3: Conventional Collection System (SD#1)

ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT PRICE	ESTIMATED TOTAL
1	4-Inch DR-11 HDPE Force Main Complete	LF	16,650	$ 26.00	$ 432,900.00
2	8-Inch SDR-35 Gravity Main Complete	LF	31,400	$ 80.00	$ 2,512,000.00
3	Precast Concrete 4ft Dia. Manholes Installed Complete	EA	120	$ 2,500.00	$ 300,000.00
4	4-inch Sewer Laterals Complete	EA	212	$ 2,000.00	$ 424,000.00
5	Pump Station Complete with Generator	EA	2	$ 200,000.00	$ 400,000.00
6	Air Relief Valve Manhole Complete	EA	10	$ 2,500.00	$ 25,000.00
7	Connection to Existing Manhole	EA	0	$ 3,000.00	$ -
8	Rock Excavation	CY	300	$ 75.00	$ 22,500.00
9	Compaction Testing	LS	1	$ 3,000.00	$ 3,000.00
10	Maintenance and Protection of Traffic Including Signs and Flagmen Meeting NYSDOT Requirements	LS	1	$ 123,582.00	$ 123,582.00
11	Mobilization	LS	1	$ 82,388.00	$ 82,388.00

SUBTOTAL =	**$**	**4,325,370.00**
CONTINGENCY (10%) =	$	432,537.00
LEGAL, ENGINEERING, ADMINISTRATION (25%) =	$	1,081,342.50
TOTAL =	$	5,839,249.50
TOTAL ESTIMATED CONSTRUCTION COST =	**$**	**5,839,300.00**

Option #2: Conventional Collection System (SD#2)

ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT PRICE	ESTIMATED TOTAL
1	8-Inch SDR-35 Gravity Main Complete	LF	21,415	$ 80.00	$ 1,713,200.00
2	Precast Concrete 4ft Dia. Manholes Installed Complete	EA	54	$ 2,500.00	$ 133,843.75
3	Directional Drilling with 4-Inch HDPE	LF	0	$ 100.00	$ -
4	4-inch Sewer Laterals Complete	EA	249	$ 2,000.00	$ 498,000.00
5	Pump Station Complete with Generator	EA	1	$ 200,000.00	$ 200,000.00
6	Air Relief Valve Manhole Complete	EA	2	$ 2,500.00	$ 5,000.00
7	Connection to Existing Manhole	EA	0	$ 3,000.00	$ -
8	Rock Excavation	CY	200	$ 75.00	$ 15,000.00
9	Compaction Testing	LS	1	$ 3,000.00	$ 3,000.00
10	Maintenance and Protection of Traffic Including Signs and Flagmen Meeting NYSDOT Requirements	LS	1	$ 77,041.31	$ 77,041.31
11	Mobilization	LS	1	$ 51,360.88	$ 51,360.88

SUBTOTAL =	**$**	**2,696,445.94**
CONTINGENCY (10%) =	$	269,644.59
LEGAL, ENGINEERING, ADMINISTRATION (25%) =	$	674,111.48
TOTAL =	$	3,640,202.02
TOTAL ESTIMATED CONSTRUCTION COST =	**$**	**3,640,300.00**

Treatment Alternative No. 1 - Connect to Springville WWTP

ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT PRICE	ESTIMATED TOTAL
1.0 Transmission to Existing WWTP					
1.1	Easement for Sewer Pipe	AC	0.50	$ 200.00	$ 100.00
1.2	Sewer Pipe, HDPE Forcemain	LF	63,400.00	$ 32.00	$ 2,028,800.00
1.3	Manholes	EA	110.00	$ 3,000.00	$ 330,000.00
1.4	Lift Station	EA	2.00	$ 200,000.00	$ 400,000.00
2.0 Upgrades to Springville WWTP					
2.1	Capacity Upgrades	GPD	175,000.00	$ 10.00	$ 1,750,000.00
3.0 Construction Costs					
3.1	Div 1/ Mobilization	2%		$ 90,178.00	$ 90,178.00

SUBTOTAL = $ 5,824,078.00

CONTINGENCY (10%) = $ 582,407.80

LEGAL, ENGINEERING, ADMINISTRATION (25%) = $ 1,456,019.50

TOTAL = $ 7,862,505.30

TOTAL ESTIMATED CONSTRUCTION COST = $ 7,862,600.00

Treatment Alternative No. 1 - Connect to Springville WWTP (Option 1A)

ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT PRICE	ESTIMATED TOTAL
1.0 Transmission to Existing WWTP					
1.1	Easement for Sewer Pipe	AC	0.50	$ 200.00	$ 100.00
1.2	Sewer Pipe, HDPE Forcemain	LF	35,400.00	$ 32.00	$ 1,132,800.00
1.3	Manholes	EA	0.00	$ 3,000.00	$ -
1.4	Lift Station	EA	2.00	$ 200,000.00	$ 400,000.00
2.0 Upgrades to Springville WWTP					
2.1	Capacity Upgrades	GPD	175,000.00	$ 10.00	$ 1,750,000.00
3.0 Construction Costs					
3.1	Div 1/ Mobilization	2%		$ 65,658.00	$ 65,658.00

SUBTOTAL = $4,573,558.00

CONTINGENCY (10%) = $ 457,355.80

LEGAL, ENGINEERING, ADMINISTRATION (25%) = $ 1,143,389.50

TOTAL = $ 6,174,303.30

TOTAL ESTIMATED CONSTRUCTION COST = $ 6,174,400.00

Treatment Alternative No. 2 - Package Plant for Sanitary Sewer District No. 1 (SSD1)

ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT PRICE	ESTIMATED TOTAL
1.0 Transmission to SSD1 WWTP Site					
1.1	Sewer Pipe, HDPE Forcemain	LF	3,050.00	$ 32.00	$ 97,600.00
1.2	Manholes	EA	11.00	$ 3,000.00	$ 33,000.00
1.3	Lift Station	EA	2.00	$ 200,000.00	$ 400,000.00
2.0 Construction of New SSD1 WWTP					
2.1	Headworks	LS	1.00	$ 191,000.00	$ 191,000.00
2.2	Tankage	LS	1.00	$ 317,000.00	$ 317,000.00
2.3	Biological Treatment	LS	1.00	$ 401,000.00	$ 401,000.00
2.4	Aerobic Digestion	LS	1.00	$ 117,000.00	$ 117,000.00
2.5	Effluent Disinfection	LS	1.00	$ 108,000.00	$ 108,000.00
2.6	Solids Dewatering	LS	1.00	$ 150,000.00	$ 150,000.00
2.7	Electrical and Controls	LS	1.00	$ 205,000.00	$ 205,000.00
2.8	Site Work	LS	1.00	$ 50,000.00	$ 50,000.00
2.9	Administration, Laboratory and Controls Bldg	LS	1.00	$ 150,000.00	$ 150,000.00
3.0 Construction Costs					
3.1	Mobilization	2%		$ 44,392.00	$ 44,392.00

Treatment Alternative No. 2 - Package Plant for Sanitary Sewer District No. 2 (SSD2)

ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT PRICE	ESTIMATED TOTAL
1.0 Transmission to SSD2 WWTP Site					
1.1	Easement/Land Acquisition for Treatment Plant	AC	5.00	$ 450.00	$ 2,250.00
1.2	Easement for Sewer Pipe	AC	0.50	$ 200.00	$ 100.00
1.3	Sewer Pipe, HDPE Forcemain	LF	1,400.00	$ 32.00	$ 44,800.00
1.4	Lift Station	EA	1.00	$ 200,000.00	$ 200,000.00
2.0 Construction of New SSD2 WWTP					
2.1	Headworks	LS	1.00	$ 191,000.00	$ 191,000.00
2.2	Tankage	LS	1.00	$ 317,000.00	$ 317,000.00
2.3	Biological Treatment	LS	1.00	$ 401,000.00	$ 401,000.00
2.4	Aerobic Digestion	LS	1.00	$ 117,000.00	$ 117,000.00

2.5	Effluent Disinfection	LS	1.00	$ 108,000.00	$ 108,000.00
2.6	Solids Dewatering	LS	1.00	$ 150,000.00	$ 150,000.00
2.7	Electrical and Controls	LS	1.00	$ 205,000.00	$ 205,000.00
2.8	Site Work	LS	1.00	$ 50,000.00	$ 50,000.00
2.9	Administration, Laboratory and Controls Bldg	LS	1.00	$ 150,000.00	$ 150,000.00
3.0 Construction Costs					
3.1	Div 1/ Mobilization	2%		$ 38,678.00	$ 38,678.00

SUBTOTAL = $ 4,238,820.00

CONTINGENCY (10%) = $ 423,882.00

LEGAL, ENGINEERING, ADMINISTRATION (25%) = $ 1,059,705.00

TOTAL = $ 5,722,407.00

TOTAL ESTIMATED CONSTRUCTION COST = $ 5,722,500.00

Treatment Alternative No. 2 - Package Plant for Sanitary Sewer District No. 1 (SSD1) Option 2A

ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT PRICE	ESTIMATED TOTAL
1.0 Transmission to SSD1 WWTP Site					
1.1	Sewer Pipe, HDPE Forcemain	LF	3,050.00	$ 32.00	$ 97,600.00
1.2	Manholes	EA	11.00	$ 3,000.00	$ 33,000.00
1.3	Lift Station	EA	2.00	$ 200,000.00	$ 400,000.00
2.0 Construction of New SSD1 WWTP					
2.1	Headworks	LS	1.00	$ 191,000.00	$ 191,000.00
2.2	Tankage	LS	1.00	$ 317,000.00	$ 317,000.00
2.3	Biological Treatment	LS	1.00	$ 401,000.00	$ 401,000.00
2.4	Aerobic Digestion	LS	1.00	$ 117,000.00	$ 117,000.00
2.5	Effluent Disinfection	LS	1.00	$ 108,000.00	$ 108,000.00
2.6	Solids Dewatering	LS	1.00	$ 150,000.00	$ 150,000.00
2.7	Electrical and Controls	LS	1.00	$ 205,000.00	$ 205,000.00
2.8	Site Work	LS	1.00	$ 50,000.00	$ 50,000.00
2.9	Administration, Laboratory and Controls Bldg	LS	1.00	$ 150,000.00	$ 150,000.00
3.0 Construction Costs					
3.1	Mobilization	2%		$ 44,392.00	$ 44,392.00

SUBTOTAL = $ 2,263,992.00

CONTINGENCY (10%) = $ 226,399.20

LEGAL, ENGINEERING, ADMINISTRATION (25%) = $ 565,998.00

TOTAL = $ 3,056,389.20

TOTAL ESTIMATED CONSTRUCTION COST = $ 3,056,400.00

Treatment Alternative No. 2 - Package Plant for Sanitary Sewer District No. 2 (SSD2) Option 2B

ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT PRICE	ESTIMATED TOTAL
1.0 Transmission to SSD2 WWTP Site					
1.1	Easement/Land Acquisition for Treatment Plant	AC	5.00	$ 450.00	$ 2,250.00
1.2	Easement for Sewer Pipe	AC	0.50	$ 200.00	$ 100.00
1.3	Sewer Pipe, HDPE Forcemain	LF	1,400.00	$ 32.00	$ 44,800.00
1.4	Lift Station	EA	1.00	$ 200,000.00	$ 200,000.00
2.0 Construction of New SSD2 WWTP					
2.1	Headworks	LS	1.00	$ 191,000.00	$ 191,000.00
2.2	Tankage	LS	1.00	$ 317,000.00	$ 317,000.00
2.3	Biological Treatment	LS	1.00	$ 401,000.00	$ 401,000.00
2.4	Aerobic Digestion	LS	1.00	$ 117,000.00	$ 117,000.00
2.5	Effluent Disinfection	LS	1.00	$ 108,000.00	$ 108,000.00
2.6	Solids Dewatering	LS	1.00	$ 150,000.00	$ 150,000.00
2.7	Electrical and Controls	LS	1.00	$ 205,000.00	$ 205,000.00
2.8	Site Work	LS	1.00	$ 50,000.00	$ 50,000.00
2.9	Administration, Laboratory and Controls Bldg	LS	1.00	$ 150,000.00	$ 150,000.00
3.0 Construction Costs					
3.1	Div 1/ Mobilization	2%		$ 38,678.00	$ 38,678.00

SUBTOTAL = $ 1,974,828.00

CONTINGENCY (10%) = $ 197,482.80

LEGAL, ENGINEERING, ADMINISTRATION (25%) = $ 493,707.00

TOTAL = $ 2,666,017.80

TOTAL ESTIMATED CONSTRUCTION COST = $ 2,666,100.00

Treatment Alternative No. 3 - Centralized WWTP

ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT PRICE	ESTIMATED TOTAL
1.0 SSD1 Transmission to Centralized WWTP Site					
1.1	Easement for Sewer Pipe	AC	0.00	$ 200.00	$ -
1.2	Sewer Pipe, HDPE Forcemain	LF	21,000.00	$ 32.00	$ 672,000.00
1.3	Manholes	EA	70.00	$ 3,000.00	$ 210,000.00
1.4	Lift Station	EA	2.00	$ 200,000.00	$ 400,000.00
2.0 SSD2 Transmission to Centralized WWTP Site					
2.1	Easement for Sewer Pipe	AC	0.50	$ 200.00	$ 100.00
2.2	Sewer Pipe, PVC, Gravity	LF	8,350.00	$ 32.00	$ 267,200.00
2.3	Manholes	EA	28.00	$ 3,000.00	$ 84,000.00
2.4	Lift Station	EA	1.00	$ 200,000.00	$ 200,000.00
3.0 Construction of New Centralized WWTP					
3.1	Headworks	LS	1.00	$ 194,000.00	$ 194,000.00
3.2	Tankage	LS	1.00	$ 346,000.00	$ 346,000.00
3.3	Biological Treatment	LS	1.00	$ 480,000.00	$ 480,000.00
3.4	Aerobic Digestion	LS	1.00	$ 170,000.00	$ 170,000.00
3.5	Effluent Disinfection	LS	1.00	$ 153,000.00	$ 153,000.00
3.6	Solids Dewatering	LS	1.00	$ 150,000.00	$ 150,000.00
3.7	Electrical and Controls	LS	1.00	$ 205,000.00	$ 205,000.00
3.8	Site Work	LS	1.00	$ 100,000.00	$ 100,000.00
3.9	Administration, Laboratory and Controls Bldg	LS	1.00	$ 200,000.00	$ 200,000.00
3.0 Construction Costs					
3.1	Div 1/ Mobilization	2%		$ 76,626.00	$ 76,626.00

SUBTOTAL =	**$ 3,907,926.00**
CONTINGENCY (10%) =	$ 390,792.60
LEGAL, ENGINEERING, ADMINISTRATION (25%) =	$ 976,981.50
TOTAL =	$ 5,275,700.10
TOTAL ESTIMATED CONSTRUCTION COST =	**$ 5,275,800.00**

SSD1 Forcemain to Centralized WWTP					
ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT PRICE	ESTIMATED TOTAL
1A	6" Forcemain	LF	21,000	$32	$672,000
2	Air/Vac Valve and Pull Box	EA	5	$2,500	$12,500
1B	4" Forcemain	LF	21,000	$26	$546,000

SUBTOTAL (1A+2) =		**$684,500**
CONTINGENCY (10%) =	$	68,450.00
LEGAL, ENGINEERING, ADMINISTRATION (25%) =	$	171,125.00
TOTAL =	$	924,075.00
TOTAL ESTIMATED CONSTRUCTION COST (6" FORCEMAIN)=	**$**	**924,100.00**

SUBTOTAL (1B+2) =		**$558,500**
CONTINGENCY (10%) =	$	55,850.00
LEGAL, ENGINEERING, ADMINISTRATION (25%) =	$	139,625.00
TOTAL =	$	753,975.00
TOTAL ESTIMATED CONSTRUCTION COST (4" FORCEMAIN) =	**$**	**754,000.00**

SSD2 Forcemain to Centralized WWTP via Thornwood Drive					
ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT PRICE	ESTIMATED TOTAL
1A	6" Forcemain	LF	8,350	$32	$267,200
2	Air/Vac Valve and Pull Box	EA	6	$2,500	$15,000
1B	4" Forcemain	LF	8,350	$26	$217,100

SUBTOTAL (1A+2) =		**$282,200**
CONTINGENCY (10%) =	$	28,220.00
LEGAL, ENGINEERING, ADMINISTRATION (25%) =	$	70,550.00
TOTAL =	$	380,970.00
TOTAL ESTIMATED CONSTRUCTION COST (6" FORCEMAIN)=	**$**	**381,000.00**

SUBTOTAL (1B+2) =		**$232,100**
CONTINGENCY (10%) =	$	23,210.00
LEGAL, ENGINEERING, ADMINISTRATION (25%) =	$	58,025.00
TOTAL =	$	313,335.00
TOTAL ESTIMATED CONSTRUCTION COST (4" FORCEMAIN)=	**$**	**313,400.00**

Treatment Alternative No. 3 - Centralized WWTP Option 3A

ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT PRICE	ESTIMATED TOTAL
1.0 SSD1 Transmission to Centralized WWTP Site					
1.1	Easement for Sewer Pipe	AC	0.00	$ 200.00	$ -
1.2	Sewer Pipe, PVC, Gravity	LF	21,000.00	$ 80.00	$ 1,680,000.00
1.3	Manholes	EA	70.00	$ 3,000.00	$ 210,000.00
1.4	Lift Station	EA	2.00	$ 200,000.00	$ 400,000.00
2.0 Construction of New Centralized WWTP					
2.1	Headworks	LS	1.00	$ 194,000.00	$ 194,000.00
2.2	Tankage	LS	1.00	$ 346,000.00	$ 346,000.00
2.3	Biological Treatment	LS	1.00	$ 480,000.00	$ 480,000.00
2.4	Aerobic Digestion	LS	1.00	$ 170,000.00	$ 170,000.00
2.5	Effluent Disinfection	LS	1.00	$ 153,000.00	$ 153,000.00
2.6	Solids Dewatering	LS	1.00	$ 150,000.00	$ 150,000.00
2.7	Electrical and Controls	LS	1.00	$ 205,000.00	$ 205,000.00
2.8	Site Work	LS	1.00	$ 100,000.00	$ 100,000.00
2.9	Administration, Laboratory and Controls Bldg	LS	1.00	$ 200,000.00	$ 200,000.00
3.0 Construction Costs					
3.1	Div 1/ Mobilization	2%		$ 104,802.00	$ 104,802.00

SUBTOTAL =	**$ 4,392,802.00**
CONTINGENCY (10%) =	$ 439,280.20
LEGAL, ENGINEERING, ADMINISTRATION (25%) =	$ 1,098,200.50
TOTAL =	$ 5,930,282.70
TOTAL ESTIMATED CONSTRUCTION COST =	**$ 5,930,300.00**

Treatment Alternative No. 3 - Centralized WWTP Option 3B

ITEM	DESCRIPTION	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT PRICE	ESTIMATED TOTAL
1.0 SSD2 Transmission to Centralized WWTP Site					
2.1	Easement for Sewer Pipe	AC	0.50	$ 200.00	$ 100.00
2.2	Sewer Pipe, PVC, Gravity	LF	8,350.00	$ 80.00	$ 668,000.00
2.3	Manholes	EA	28.00	$ 3,000.00	$ 84,000.00
2.4	Lift Station	EA	1.00	$ 200,000.00	$ 200,000.00
2.0 Construction of New Centralized WWTP					
2.1	Headworks	LS	1.00	$ 194,000.00	$ 194,000.00
2.2	Tankage	LS	1.00	$ 346,000.00	$ 346,000.00
2.3	Biological Treatment	LS	1.00	$ 480,000.00	$ 480,000.00
2.4	Aerobic Digestion	LS	1.00	$ 170,000.00	$ 170,000.00
2.5	Effluent Disinfection	LS	1.00	$ 153,000.00	$ 153,000.00
2.6	Solids Dewatering	LS	1.00	$ 150,000.00	$ 150,000.00
2.7	Electrical and Controls	LS	1.00	$ 205,000.00	$ 205,000.00
2.8	Site Work	LS	1.00	$ 100,000.00	$ 100,000.00
2.9	Administration, Laboratory and Controls Bldg	LS	1.00	$ 200,000.00	$ 200,000.00
3.0 Construction Costs					
3.1	Div 1/ Mobilization	2%		$ 104,802.00	$ 104,802.00

SUBTOTAL =	**$ 3,054,902.00**
CONTINGENCY (10%) =	$ 305,490.20
LEGAL, ENGINEERING, ADMINISTRATION (25%) =	$ 763,725.50
TOTAL =	$ 4,124,117.70
TOTAL ESTIMATED CONSTRUCTION COST =	**$ 4,124,200.00**

Appendix G

Financial Analysis

Town of Ashford
Sanitary Sewer Feasibility Study
Prelim Engineering Estimate
February 2021

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TREATMENT ALTERNATIVES ANNUAL OPERATING BUDGETS

Treatment Alternative 1: Connection to Springville WWTF

Item	Description	Quantity	Unit	Unit Price	Total
1	Sanitary Sewer Operator	1	LS	$20,000.00	$ 20,000.00
2	Electric	1	LS	$8,000.00	$ 8,000.00
3	Insurance	1	LS	$1,000.00	$ 1,000.00
4	Vehicle Costs	1	LS	$2,000.00	$ 2,000.00
5	Telephone	1	LS	$500.00	$ 500.00
6	Billing/Record Keeping	1	LS	$8,000.00	$ 8,000.00
7	Disposal Fees	1	LS	$359,300.00	$ 359,300.00
8	Testing/Sampling	1	LS	$1,000.00	$ 1,000.00
9	Odor Control	1	LS	$30,000.00	$ 30,000.00
10	Short Lived Asset (Replacement Parts)	1	LS	$2,506.67	$ 2,506.67
11	Reserve	1	LS	$5,000.00	$ 5,000.00
TOTAL ANNUAL OPERATING BUDGET:					**$ 437,306.67**

Treatment Alternative 2: New Package WWTF

Item	Description	Quantity	Unit	Unit Price	Total
1	Sanitary Sewer Operator	1	LS	$45,000.00	$ 45,000.00
2	Electric	1	LS	$15,000.00	$ 15,000.00
3	Insurance	1	LS	$4,000.00	$ 4,000.00
4	Vehicle Costs	1	LS	$2,000.00	$ 2,000.00
5	Telephone	1	LS	$500.00	$ 500.00
6	Billing/Record Keeping	1	LS	$8,000.00	$ 8,000.00
7	Contract Maintenance	1	LS	$15,000.00	$ 15,000.00
8	Testing/Sampling	1	LS	$3,000.00	$ 3,000.00

9	Sludge Disposal	1	LS	$15,000.00	$ 15,000.00
10	Short Lived Asset (Replacement Parts)	1	LS	$15,733.33	$ 15,733.33
11	Reserve	1	LS	$10,000.00	$ 10,000.00
TOTAL ANNUAL OPERATING BUDGET:					**$ 133,233.33**

Treatment Alternative 3: Centralized WWTF

Item	Description	Quantity	Unit	Unit Price	Total
1	Sanitary Sewer Operator	1	LS	$45,000.00	$ 45,000.00
2	Electric	1	LS	$20,000.00	$ 20,000.00
3	Insurance	1	LS	$4,000.00	$ 4,000.00
4	Vehicle Costs	1	LS	$2,000.00	$ 2,000.00
5	Telephone	1	LS	$500.00	$ 500.00
6	Billing/Record Keeping	1	LS	$8,000.00	$ 8,000.00
7	Contract Maintenance	1	LS	$15,000.00	$ 15,000.00
8	Testing/Sampling	1	LS	$3,000.00	$ 3,000.00
9	Sludge Disposal	1	LS	$15,000.00	$ 15,000.00
10	Short Lived Asset (Replacement Parts)	1	LS	$14,733.33	$ 14,733.33
11	Reserve	1	LS	$10,000.00	$ 10,000.00
TOTAL ANNUAL OPERATING BUDGET:					**$ 137,233.33**

Collection System SD1

Item	Description	Quantity	Unit	Unit Price	Total	Expected Life Cycle (Years)	Annual Cost
1	Grinder Pumps	175	EA	$300.00	$52,500.00	10	$5,250.00
2	Lift Station Pumps	4	EA	$2,500.00	$10,000.00	20	$500.00
3	Lift Station Generators	2	EA	$15,000.00	$30,000.00	25	$1,200.00
						Total Annual Costs:	$6,950

Collection System SD2

Item	Description	Quantity	Unit	Unit Price	Total	Expected Life Cycle (Years)	Annual Cost
1	Grinder Pumps	0	EA	$300.00	$0.00	10	$0.00
2	Lift Station Pumps	2	EA	$2,500.00	$5,000.00	20	$250.00
3	Lift Station Generators	1	EA	$15,000.00	$15,000.00	25	$600.00
						Total Annual Costs:	$850

Treatment Alternative 1

Item	Description	Quantity	Unit	Unit Price	Total	Expected Life Cycle (Years)	Annual Cost
1	Air Release Valves	8	EA	$ 300.00	$ 2,400.00	10	$ 240.00
2	Chemical Feed Pumps	2	EA	$ 500.00	$ 1,000.00	5	$ 200.00
3	Main Lift Station Pumps	2	EA	$ 8,000.00	$ 16,000.00	15	$ 1,066.67
4	Main Generator	1	EA	$ 25,000.00	$ 25,000.00	25	$ 1,000.00
						TOTAL ANNUAL COSTS:	$ 2,506.67

Treatment Alternative 2: New Package WWTF

Item	Description	Quantity	Unit	Unit Price	Total	Expected Life Cycle (Years)	Annual Cost
1	Influent Screen	1	EA	$ 90,000.00	$ 90,000.00	25	$ 3,600.00
2	Lift Pumps	2	EA	$ 5,000.00	$ 10,000.00	15	$ 666.67
3	Blowers and Diffusers	1	LS	$ 55,000.00	$ 55,000.00	15	$ 3,666.67
4	Generator and Misc. Electric	1	EA	$ 40,000.00	$ 40,000.00	25	$ 1,600.00
5	Steel Tanks	1	LS	$ 10,000.00	$ 10,000.00	10	$ 1,000.00
6	Drives and Gear Boxes	6	EA	$ 5,000.00	$ 30,000.00	25	$ 1,200.00
7	Sludge Handling Equip	1	LS	$100,000.00	$ 100,000.00	25	$ 4,000.00
						TOTAL ANNUAL COSTS:	$ 15,733.33

Treatment Alternative 3: Centralized WWTF

Item	Description	Quantity	Unit	Unit Price	Total	Expected Life Cycle (Years)	Annual Cost
1	Influent Screen	1	EA	$ 90,000.00	$ 90,000.00	25	$ 3,600.00
2	Lift Pumps	2	EA	$ 5,000.00	$ 10,000.00	15	$ 666.67
3	Blowers and Diffusers	1	LS	$ 55,000.00	$ 55,000.00	15	$ 3,666.67
4	Generator and Misc. Electric	1	EA	$ 40,000.00	$ 40,000.00	25	$ 1,600.00
5	Drives and Gear Boxes	6	EA	$ 5,000.00	$ 30,000.00	25	$ 1,200.00
6	Sludge Handling Equip	1	LS	$100,000.00	$ 100,000.00	25	$ 4,000.00
						TOTAL ANNUAL COSTS:	$ 14,733.33

Town of Ashford
Sanitary Sewer Feasibility Study
Prelim Engineering Estimate
February 2021

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FUNDING SCENARIOS

Proposed Project: SSD1 and Treatment Alternative No. 2 Option 2A

SSD2 Total Capital Costs:	$3,720,000
Treatment Alteranative No. 2 Total Capital Costs:	$3,056,400
Total Project Capital Costs:	$6,776,400

NYSEFC Loan: 30 Years @ 3%

Grant Amount:	$0
Net Local Project Cost:	$6,776,400
Estimated Debt Service:	$345,727
Number of EDU's:	174
Estimated Debt Service/Unit/Year:	$1,986.94
Annual Town O&M Costs :	$133,233
Annual Town O&M Costs Per EDU:	$765.71
Estimated Yearly Sewer Cost:	
Total Unit Cost:	$2,752.64
Total Estimated Unit Cost:	**$2,752.64**

NYSEFC Principal Forgiveness: 30 Years @ 0.0%

Grant Amount:	($1,500,000)
Net Local Project Cost:	$5,276,400
Estimated Debt Service:	$175,880
Number of EDU's:	174
Estimated Debt Service/Unit/Year:	$1,010.80
Annual Town O&M Costs :	$133,233
Annual Town O&M Costs Per EDU:	$765.71
Estimated Yearly Sewer Cost:	
Total Unit Cost:	$1,776.51
Total Estimated Unit Cost:	**$1,776.51**

USDA Grant of 45% ($500,000) and 38 Years @ 3.5%

Grant Amount:	($500,000)
Net Local Project Cost:	$6,276,400
Estimated Debt Service:	$301,156
Number of EDU's:	174
Estimated Debt Service/Unit/Year:	$1,730.78
Annual Town O&M Costs :	$133,233
Annual Town O&M Costs Per EDU:	$765.71
Estimated Yearly Sewer Cost:	
Total Unit Cost:	$2,496.49
Total Estimated Unit Cost:	**$2,496.49**

NYSEFC Principal Forgiveness: 30 Years @ 0.0%

Grant Amount:	($2,000,000)
Net Local Project Cost:	$4,776,400
Estimated Debt Service:	$159,214
Number of EDU's:	174
Estimated Debt Service/Unit/Year:	$915.02
Annual Town O&M Costs :	$133,233
Annual Town O&M Costs Per EDU:	$765.71
Estimated Yearly Sewer Cost:	
Total Unit Cost:	$1,680.73
Total Estimated Unit Cost:	**$1,680.73**

NYSEFC Principal Forgiveness: 30 Years @ 0.0%

Grant Amount:	($4,000,000)
Net Local Project Cost:	$2,776,400
Estimated Debt Service:	$92,547
Number of EDU's:	174
Estimated Debt Service/Unit/Year:	$531.88
Annual Town O&M Costs :	$133,233
Annual Town O&M Costs Per EDU:	$765.71
Estimated Yearly Sewer Cost:	
Total Unit Cost:	$1,297.59
Total Estimated Unit Cost:	**$1,297.59**

Town of Ashford
Sanitary Sewer Feasibility Study
Prelim Engineering Estimate
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FUNDING SCENARIOS

Proposed Project: SSD2 and Treatment Alternative No. 2 Option 2B

SSD2 Total Capital Costs:	$3,640,300
Treatment Alteranative No. 2 Total Capital Costs:	$2,666,100
Total Project Capital Costs:	$6,306,400

NYSEFC Loan: 30 Years @ 3%

Grant Amount:	$0
Net Local Project Cost:	$6,306,400
Estimated Debt Service:	$321,748
Number of EDU's:	249
Estimated Debt Service/Unit/Year:	$1,290.55
Annual Town O&M Costs :	$133,233
Annual Town O&M Costs Per EDU:	$534.41
Estimated Yearly Sewer Cost:	
Total Unit Cost:	$1,824.96
Total Estimated Unit Cost:	**$1,824.96**

NYSEFC Principal Forgiveness: 30 Years @ 0.0%

Grant Amount:	($1,500,000)
Net Local Project Cost:	$4,806,400
Estimated Debt Service:	$160,214
Number of EDU's:	249
Estimated Debt Service/Unit/Year:	$643.43
Annual Town O&M Costs :	$133,233
Annual Town O&M Costs Per EDU:	$535.07
Estimated Yearly Sewer Cost:	
Total Unit Cost:	$1,178.50
Total Estimated Unit Cost:	**$1,178.50**

USDA Grant of 45% ($500,000) and 38 Years @ 3.5%

Grant Amount:	($500,000)
Net Local Project Cost:	$5,806,400
Estimated Debt Service:	$278,604
Number of EDU's:	249
Estimated Debt Service/Unit/Year:	$1,118.89
Annual Town O&M Costs :	$133,233
Annual Town O&M Costs Per EDU:	$535.07
Estimated Yearly Sewer Cost:	
Total Unit Cost:	$1,653.96
Total Estimated Unit Cost:	**$1,653.96**

NYSEFC Principal Forgiveness: 30 Years @ 0.0%

Grant Amount:	($2,000,000)
Net Local Project Cost:	$4,306,400
Estimated Debt Service:	$143,547
Number of EDU's:	249
Estimated Debt Service/Unit/Year:	$576.49
Annual Town O&M Costs :	$133,233
Annual Town O&M Costs Per EDU:	$535.07
Estimated Yearly Sewer Cost:	
Total Unit Cost:	$1,111.57
Total Estimated Unit Cost:	**$1,111.57**

NYSEFC Principal Forgiveness: 30 Years @ 0.0%

Grant Amount:	($4,000,000)
Net Local Project Cost:	$2,306,400
Estimated Debt Service:	$76,880
Number of EDU's:	249
Estimated Debt Service/Unit/Year:	$308.76
Annual Town O&M Costs :	$133,233
Annual Town O&M Costs Per EDU:	$535.07
Estimated Yearly Sewer Cost:	
Total Unit Cost:	$843.83
Total Estimated Unit Cost:	**$843.83**

Town of Ashford
Sanitary Sewer Feasibility Study
Prelim Engineering Estimate
February 2021

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FUNDING SCENARIOS

Proposed Project: SSD1, SSD2 and Treatment Alternative No. 2

SSD2 Total Capital Costs:	$7,360,300
Treatment Alteranative No. 2 Total Capital Costs:	$5,722,500
Total Project Capital Costs:	$13,082,800

NYSEFC Loan: 30 Years @ 3%

Grant Amount:	$0
Net Local Project Cost:	$13,082,800
Estimated Debt Service:	$667,475
Number of EDU's:	423
Estimated Debt Service/Unit/Year:	$1,577.96
Annual Town O&M Costs :	$133,233
Annual Town O&M Costs Per EDU:	$314.97
Estimated Yearly Sewer Cost:	
Total Unit Cost:	$1,892.93
Total Estimated Unit Cost:	**$1,892.93**

NYSEFC Principal Forgiveness: 30 Years @ 0.0%

Grant Amount:	($1,500,000)
Net Local Project Cost:	$11,582,800
Estimated Debt Service:	$386,094
Number of EDU's:	423
Estimated Debt Service/Unit/Year:	$912.75
Annual Town O&M Costs :	$133,233
Annual Town O&M Costs Per EDU:	$314.97
Estimated Yearly Sewer Cost:	
Total Unit Cost:	$1,227.72
Total Estimated Unit Cost:	**$1,227.72**

USDA Grant of 45% ($500,000) and 38 Years @ 3.5%

Grant Amount:	($500,000)
Net Local Project Cost:	$12,582,800
Estimated Debt Service:	$603,750
Number of EDU's:	423
Estimated Debt Service/Unit/Year:	$1,427.30
Annual Town O&M Costs :	$133,233
Annual Town O&M Costs Per EDU:	$314.97
Estimated Yearly Sewer Cost:	
Total Unit Cost:	$1,742.28
Total Estimated Unit Cost:	**$1,742.28**

NYSEFC Principal Forgiveness: 30 Years @ 0.0%

Grant Amount:	($2,000,000)
Net Local Project Cost:	$11,082,800
Estimated Debt Service:	$369,427
Number of EDU's:	423
Estimated Debt Service/Unit/Year:	$873.35
Annual Town O&M Costs :	$133,233
Annual Town O&M Costs Per EDU:	$314.97
Estimated Yearly Sewer Cost:	
Total Unit Cost:	$1,188.32
Total Estimated Unit Cost:	**$1,188.32**

NYSEFC Principal Forgiveness: 30 Years @ 0.0%

Grant Amount:	($4,000,000)
Net Local Project Cost:	$9,082,800
Estimated Debt Service:	$302,760
Number of EDU's:	423
Estimated Debt Service/Unit/Year:	$715.74
Annual Town O&M Costs :	$133,233
Annual Town O&M Costs Per EDU:	$314.97
Estimated Yearly Sewer Cost:	
Total Unit Cost:	$1,030.72
Total Estimated Unit Cost:	**$1,030.72**