

Genesee & Wyoming Counties Joint Flood Mitigation Plan



Genesee County

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August 2003

This Report Was Prepared For:
Genesee County Emergency Management Office

This Report Prepared By:



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1 – Introduction

Genesee County is located in western New York State (see [Map 1.1](#)). The communities along the Tonawanda and Oatka Creek in Genesee and Wyoming Counties have experienced several floods in the past, resulting in severe damage to residential, commercial, and public property as well as risks to the safety of residents and others. Beginning in 1999, meetings to discuss flooding problems and streambank erosion issues in the two counties along the two streams were held and attended by a number of local, county, and regional agencies.



Genesee and Wyoming Counties Emergency Management Offices, as lead agencies on behalf of the counties and municipalities, applied for, and was awarded a Federal Emergency Management Agency Flood Mitigation Assistance - Planning Grant from the New York State Emergency Management Office.

Beginning in November 2002 the Joint Flood Mitigation Planning Committee was formed (hereafter referred to as the Committee). The Committee expanded its membership to review flood risks and hazards, encourage public involvement, develop mitigation activities, and recommend action steps to alleviate flood-related problems in the municipalities along the Tonawanda and Oatka Creek in Genesee and Wyoming counties. This plan describes and summarizes the Committee's process, findings, and recommendations.

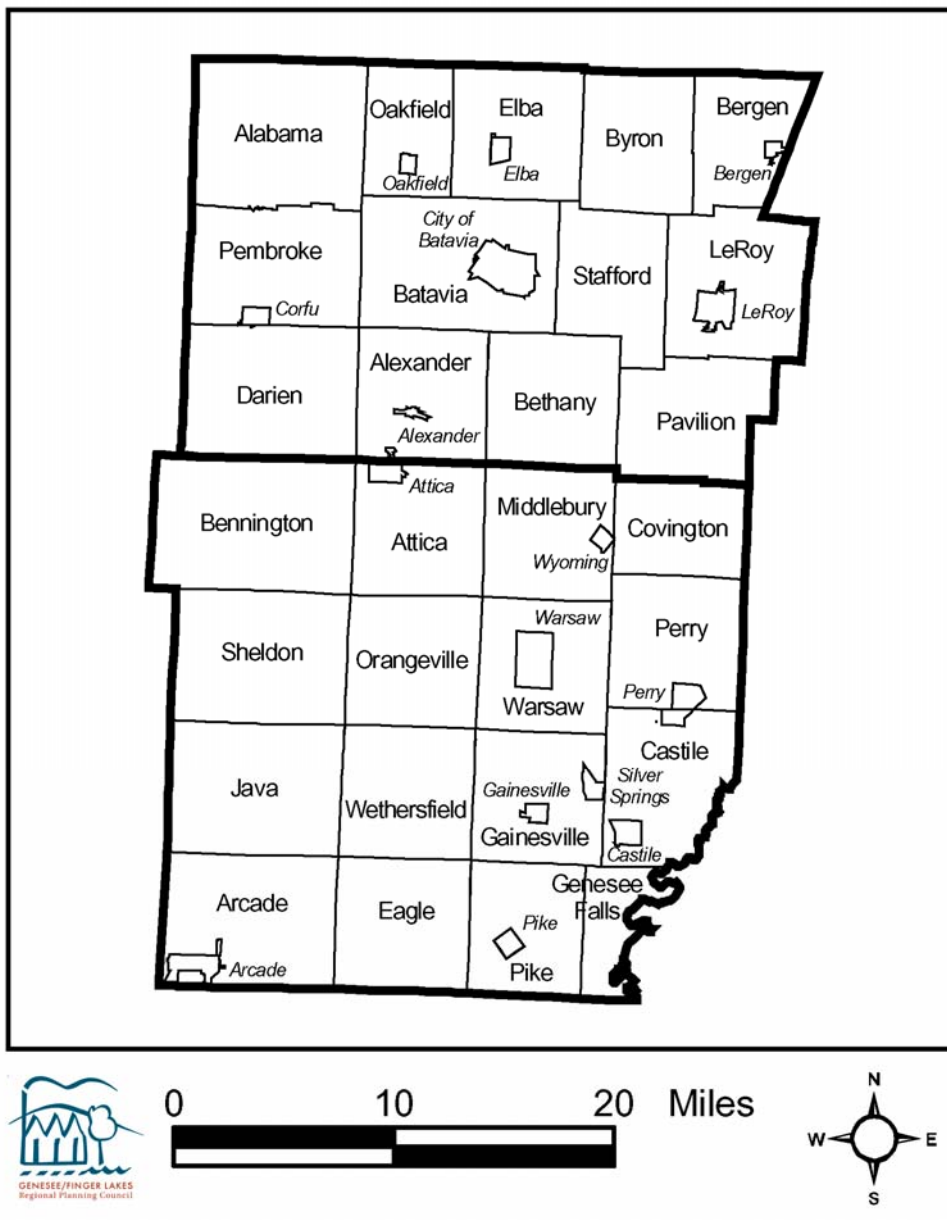
2 – Background

2.1 History and Land Use

Genesee County is located in western New York State south of Orleans County, east of Erie County, north of Wyoming County and west of Livingston and Monroe Counties.

Map 2.1

Genesee & Wyoming Counties



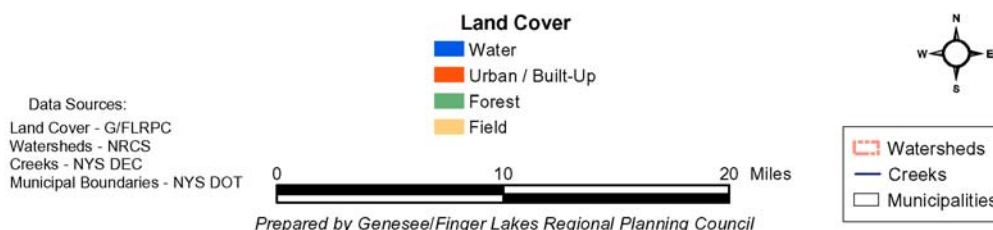
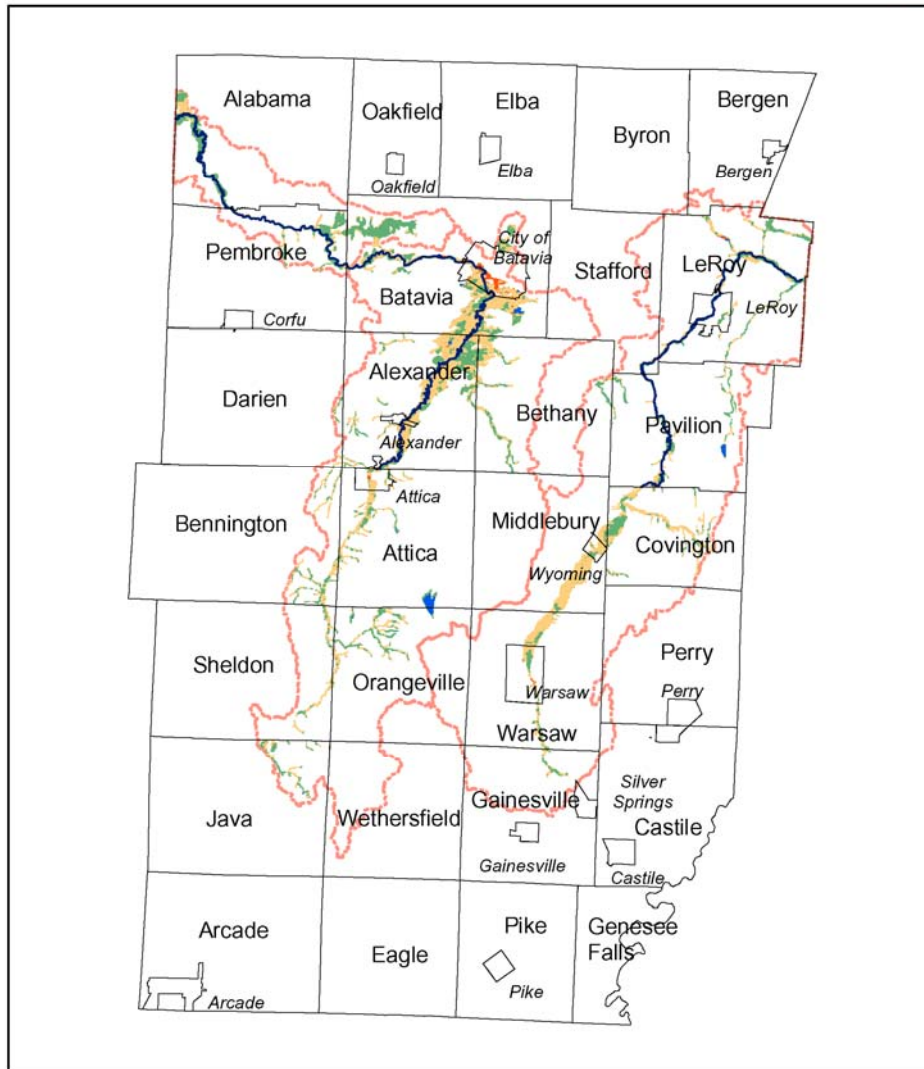
The Senecas, who were members of the Iroquois Confederacy, controlled Western New York until the close of the 18th Century. Western New York was then divided into several land tracts by investors eager to sell property to the pioneers. The Holland Land Company was the largest investor. From 1798 until 1800 a survey of their 3.5 million acres was conducted and the first sale of land was in 1801. With growing population and governmental needs Genesee County was created in 1802 and was named from the Seneca word meaning "Beautiful Valley."

The original Genesee County included all of Western New York and as populations grew within this region the neighboring counties were established (Allegany in 1806; Cattaraugus, Chautauqua and Niagara in 1808; the western portions of Livingston and Monroe in 1821; Orleans in 1824 and Wyoming in 1841). County government began in 1803 with the completion of the first courthouse west of the Genesee River and the election of county officers. The present day Genesee County encompasses 501 square miles. The County is divided into thirteen towns, beginning with Batavia, the County seat, which was organized in 1802, Alexander, LeRoy and Pembroke in 1812, Bethany and Bergen in 1813; Byron, Elba and Stafford in 1820; Alabama in 1826; Darien in 1832; Oakfield and Pavilion in 1842.

Map 2.2 illustrates the land cover in the Tonawanda and Oatka Creek 100-Year Flood Zones. Land cover in the 100-Year Flood Zone is largely fields and forest with the exception of small urbanized areas in the villages and the large urbanized area surrounding the City of Batavia. The majority of the fields are agricultural.

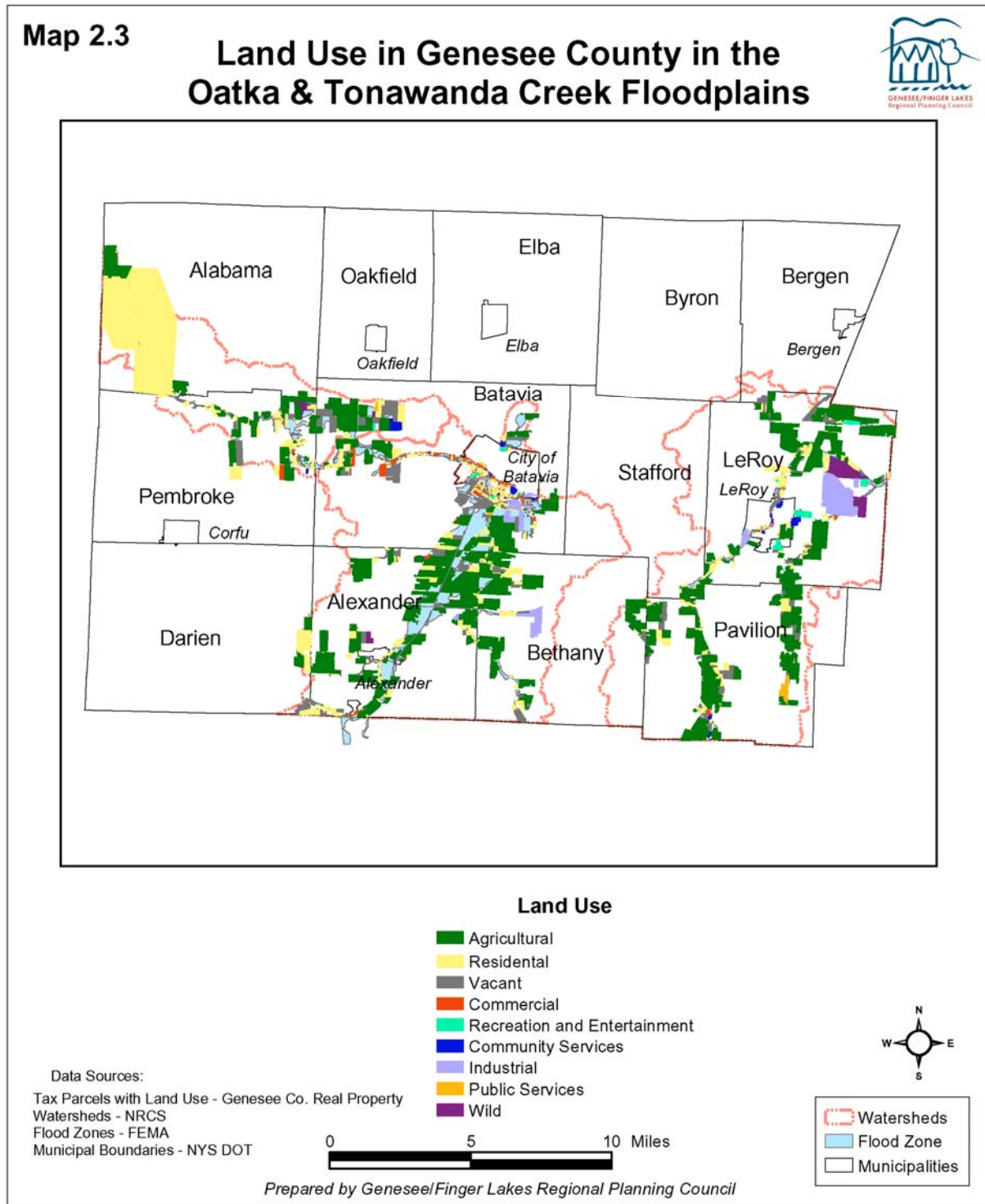
Map 2.2

Floodplain Land Cover in the Oatka & Tonawanda Creek Watersheds



Of the municipalities that are in the Oatka Creek Watershed in Genesee County, approximately 40% of their land area is in the watershed and approximately 2% of that land area is in the floodzone. Of the municipalities that are in the Tonawanda Creek Watershed in Genesee County, approximately 35% of the land area is in the watershed and approximately 6% of that land area is in the floodzone (see [Table 2.1](#)).

An analysis of land use in the flood zone is based on the real property parcel (assessors) land use classification. In Genesee County there are a total of 3,677 real property parcels in the Oatka and Tonawanda Creek flood zones in excess of 13,323 acres. The approximate percent of the main land uses are as follows: 38% agricultural, 18% residential, 11% vacant, 2% commercial, and 2% industrial (see [Map 2.3](#)).

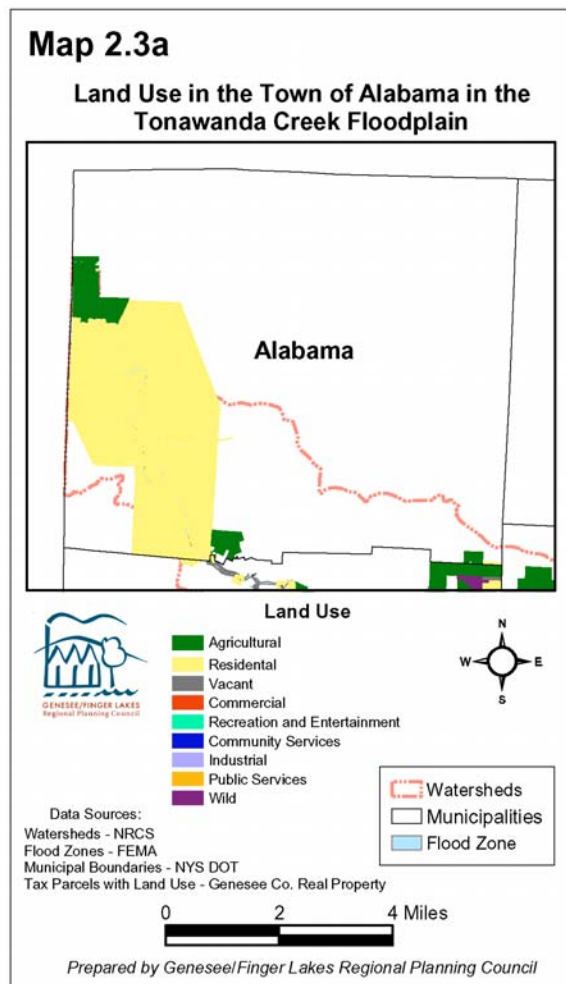


Participating Municipalities

Town of Alabama

The Town of Alabama is in northwest Genesee County (see [Map 2.1](#)). The Town adjoins the Tonawanda Indian Reservation; a Seneca village on this land preceded the 1806 European settlement of the town. In 1816 the Oak Orchard Acid Springs were discovered, inspiring a health resort for a time. The Town was formed from Shelby (Orleans County) and Pembroke in 1826 as Gerrysville; the name was changed to Alabama in 1828. The primary income source in town is dairy farming. The Iroquois National Wildlife Refuge and Tonawanda State Wildlife Management Area are in the northwest part of town and encompass a large part of the Tonawanda Swamp, in 2002 the largest swamp remaining in New York State.

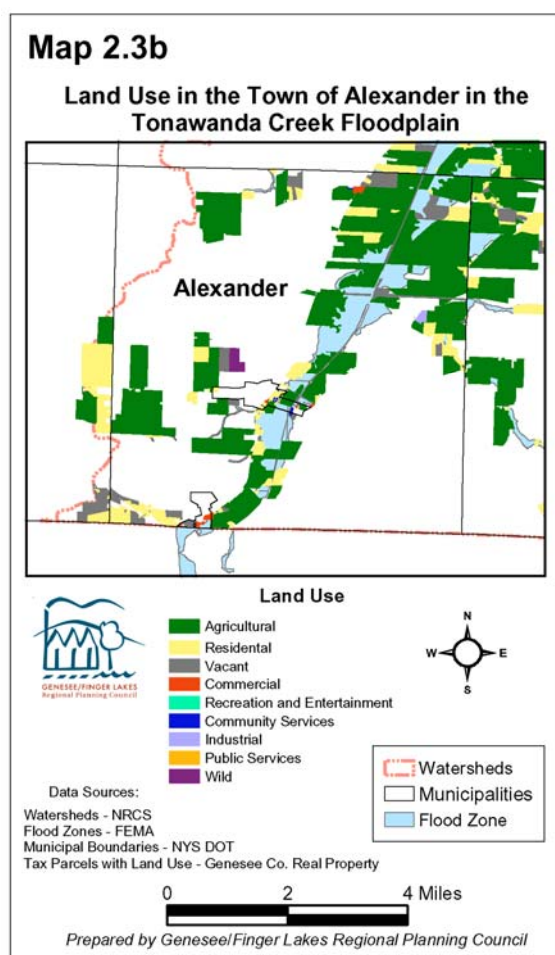
Approximately 20% of Alabama is in the Tonawanda Creek Watershed and 1% is in the flood zone (see [Table 2.1](#)). In the Town of Alabama there are a total of 52 real property parcels in the Tonawanda Creek flood zone in excess of 1,018 acres. The land use is mainly agricultural (28%) and residential (72%) (see [Map 2.3a](#)).



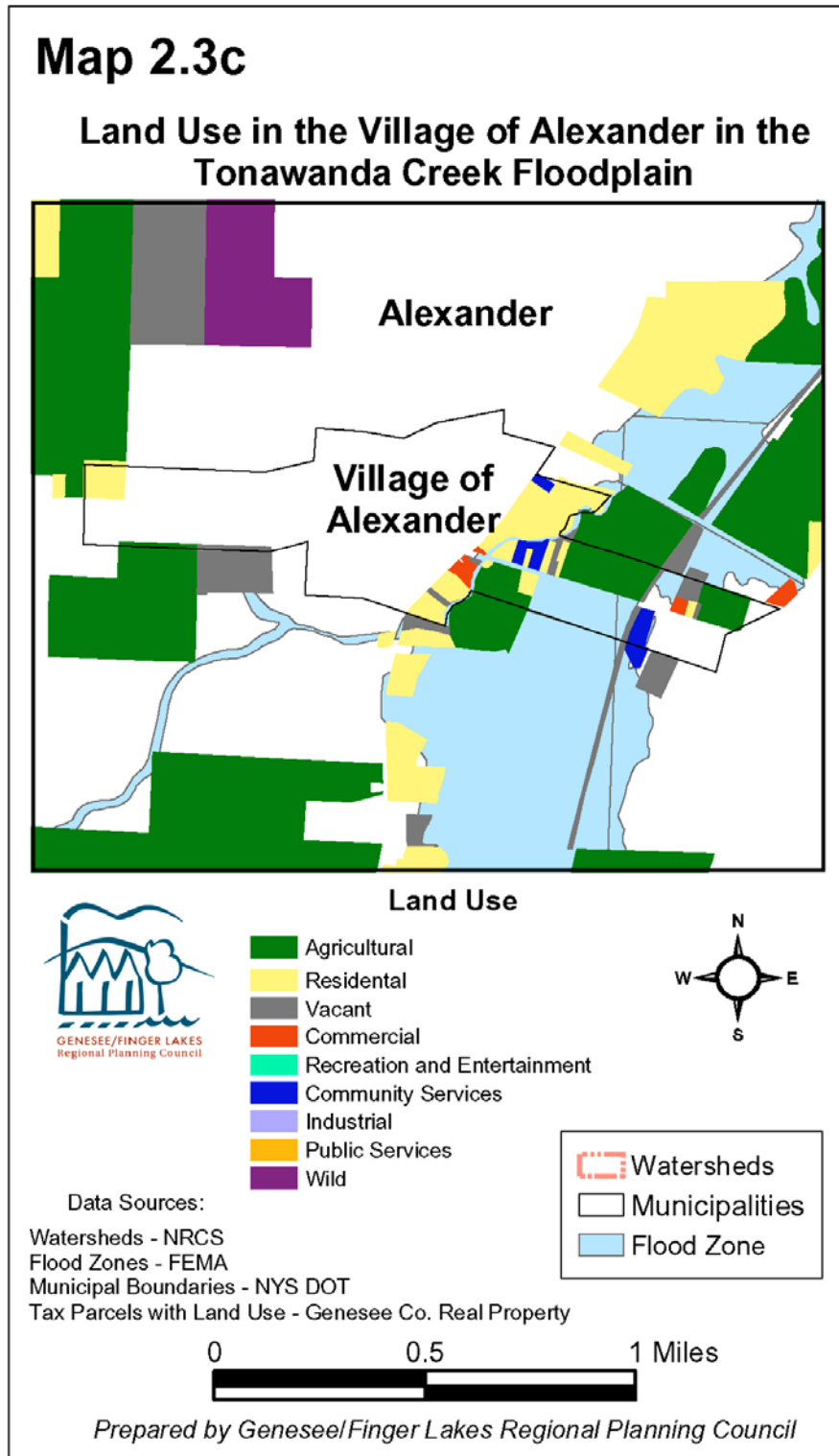
Alexander

The Town and Village of Alexander are in southern Genesee County (see [Map 2.1](#)). Alexander Rhea, for whom the Town and Village are named, recorded the first deed in 1802. Alexander had the first public library in the County (1811). The Town was formed from Batavia in 1812; the Village incorporated in 1834. The Buffalo and Rochester Railroad (after 1853, New York Central) came through in 1843. Two other lines followed. The Alexander Classical School (1837–86) was housed in a three-story cobblestone building; now listed on the National Register of Historic Places, it is the Town Hall and museum. Dairy, crop, and vegetable farms, and small businesses provide livelihoods. The Western New York Gas and Steam Engine Association's annual rally is held in the fall.

Approximately 94% of the Town of Alexander is in the Tonawanda Creek Watershed and 16% is in the flood zone (see [Table 2.1](#)). Fully 100% of the Village of Alexander is in the Tonawanda Creek Watershed and 23% is in the flood zone. In the Town of Alexander there are a total of 240 real property parcels in the Tonawanda Creek flood zone in excess of 2,638 acres. The approximate percent of the main land uses are as follows: 80% agricultural, 10% residential, and 9% vacant (see [Map 2.3b](#)).



The Village of Alexander is much more developed. There are a total of 51 real property parcels in the Tonawanda Creek flood zone in excess of 45 acres. The approximate percent of the main land uses are as follows: 43% agricultural, 40% residential, 8% vacant, and 3% commercial (see [Map 2.3c](#)).



City of Batavia

At the Treaty of Big Tree (1797) the Senecas signed away their rights to ownership of 3.5 million acres in Western New York to Robert Morris. Morris then sold 3.3 million acres of the land to a group of six Dutch banking houses called the Holland Land Company. Batavia was named in honor of the home of the six banking houses, the Republic of Batavia.

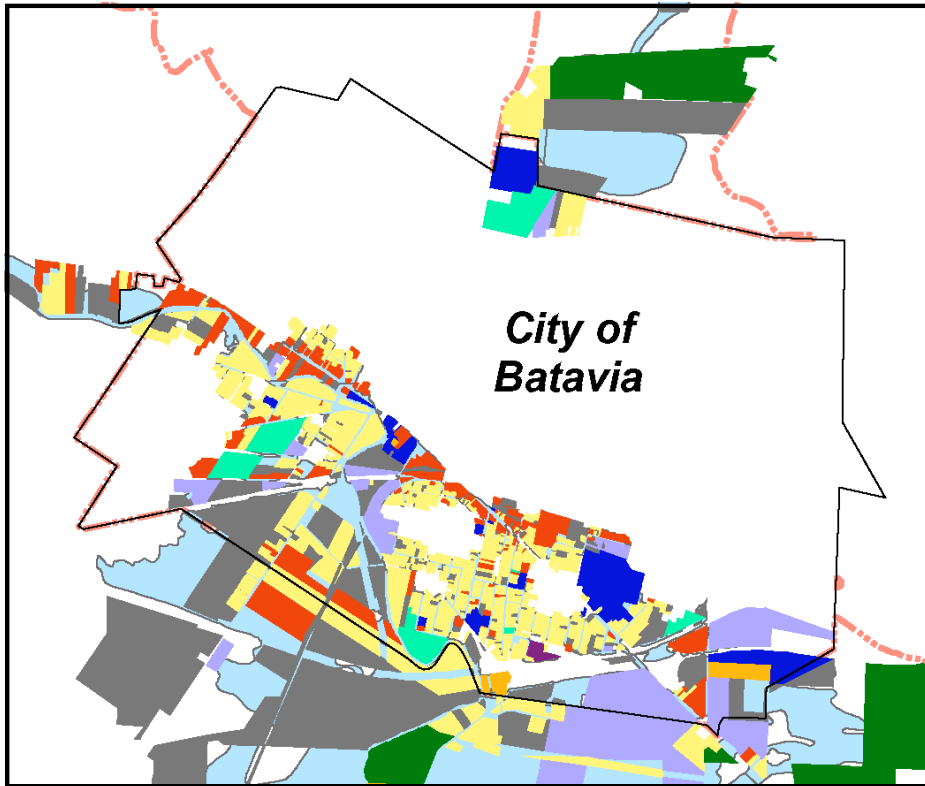
In 1801, Benjamin Ellicott, working for his brother Joseph and the Holland Land Company, built a dam and saw mill at the bend in the Tonawanda Creek, and within a year at least 30 families lived here. The site was selected because of its location along the Indian trails. By 1802, Batavia covered the entire Holland Purchase, but other towns started to break off shortly after. The same year, Batavia was selected as the seat of the new Genesee County. In 1823, Batavia was incorporated as a village.

By the time Batavia became a city in 1915, there were more than 12 industrial plants. The largest was Johnson – Harvester Co. (later Massey – Harris.) Other companies that called Batavia home include The Wiard Plow Works, The Baker Gun Company, the E.N. Rowell Company and F.E. Mason & Sons.

Approximately 82% of the City of Batavia is in the Tonawanda Creek Watershed and 20% is in the flood zone (see [Table 2.1](#)). The City of Batavia is highly developed with large areas of impervious surface. In the City of Batavia there are a total of 1,522 real property parcels in the Tonawanda Creek flood zone in excess of 552 acres. The approximate percent of the main land uses are as follows: 35% residential, 22% vacant, 14% commercial, and 11% industrial (see [Map 2.3e](#)).

Map 2.3e

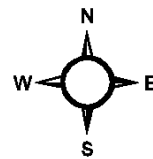
Land Use in the City of Batavia in the Tonawanda Creek Floodplain



Land Use



- Agricultural
- Residential
- Vacant
- Commercial
- Recreation and Entertainment
- Community Services
- Industrial
- Public Services
- Wild



Data Sources:

Watersheds - NRCS
 Flood Zones - FEMA
 Municipal Boundaries - NYS DOT
 Tax Parcels with Land Use - Genesee Co. Real Property

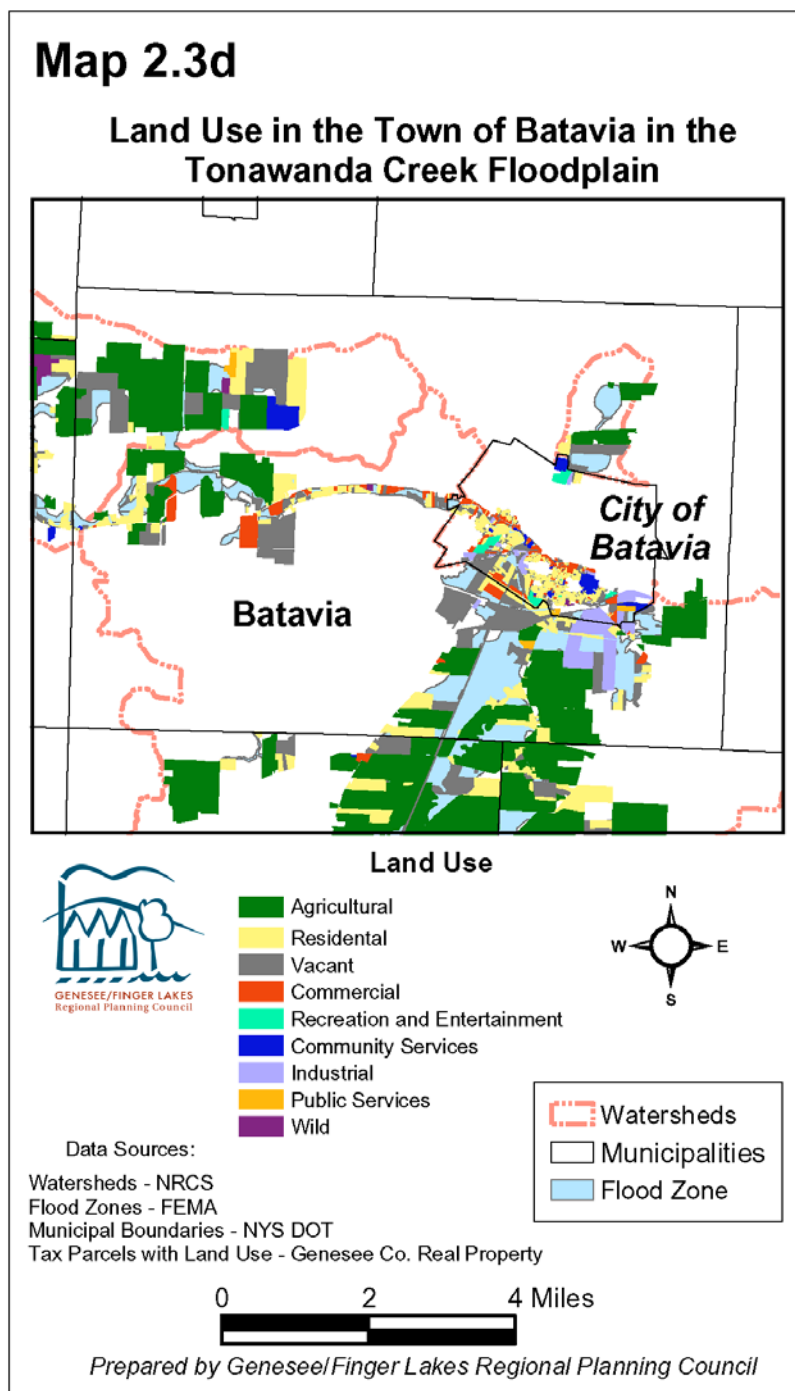
- Watersheds
- Municipalities
- Flood Zone



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Town of Batavia

Approximately 79% of the Town of Batavia is in the Tonawanda Creek Watershed and 13% is in the flood zone (see [Table 2.1](#)). In the Town of Batavia there are a total of 383 real property parcels in the Tonawanda Creek flood zones in excess of 2,492 acres. The approximate percent of the main land uses are as follows: 39% agricultural, 20% residential, 24% vacant, 4% is commercial, and 7% industrial (see [Map 2.3d](#)).



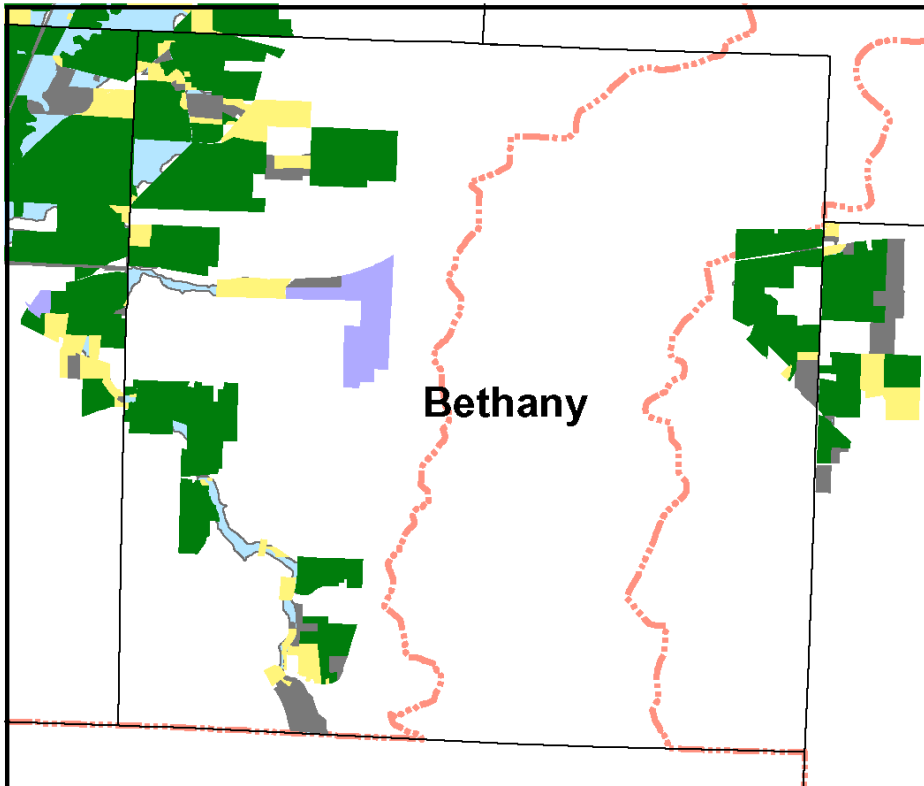
Town of Bethany

The Town of Bethany is in southeastern Genesee County (see [Map 2.1](#)). Settled in 1803, the Town formed in 1812 from Batavia. The Genesee County Home and Infirmary was built in 1827; it relocated to Batavia in 1974. In the mid 19th century, Bethany attracted a number of Irish and German immigrant farm families. The Genesee County Forest and Park (444 acres) began with the purchase of a wood lot in 1882; in 1935 it was designated a county forest, the first in New York State. Farms have become larger through consolidation, and many residents commute to Batavia or larger cities.

Approximately 62% of Bethany is in the Oatka and Tonawanda Creek Watersheds and 4% is in the flood zone (see [Table 2.1](#)). In the Town of Bethany there are a total of 100 real property parcels in the Oatka and Tonawanda Creek flood zones in excess of 653 acres. The approximate percent of the main land uses are as follows: 67% agricultural, 19% residential, and 14% vacant (see [Map 2.3f](#)).

Map 2.3f

Land Use in the Town of Bethany in the Oatka Creek Floodplain

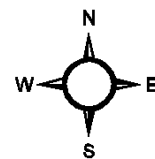


Land Use



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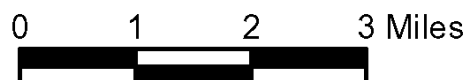
- Agricultural
- Residential
- Vacant
- Commercial
- Recreation and Entertainment
- Community Services
- Industrial
- Public Services
- Wild



- Watersheds
- Municipalities
- Flood Zone

Data Sources:

Watersheds - NRCS
Flood Zones - FEMA
Municipal Boundaries - NYS DOT
Tax Parcels with Land Use - Genesee Co. Real Property



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Town of Darien

The Town Darien is in southwestern Genesee County (see [Map 2.1](#)). Settled in 1803, the Town formed from Pembroke in 1832. Darien Lake State Park (1970), a 1,846 acre hilly woodland, provides camping, hiking, hunting, and picnicking. Six Flags Darien Lake (1964) is the largest combination theme park and family entertainment resort in the State. Dairy and truck farming and small businesses are the other economic supports for this community. A state historical marker honoring Mina C. Griswold, believed to be the first female Rural Free Delivery carrier (1902–15) in the United States, was dedicated in 1998.

Approximately 2% of Darien is in the Tonawanda Creek Watershed (see [Table 2.1](#)) and less than 1% is in the flood zone. In the Town of Darien there are a total of 15 real property parcels in the Tonawanda Creek flood zone in excess of 48 acres. The approximate percent of the main land uses are as follows: 6% agricultural, 64% residential, and 30% vacant (see [Map 2.3g](#)).

Map 2.3g

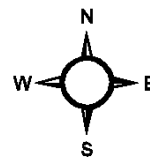
Land Use in the Town of Darien in the Tonawanda Creek Floodplain



Land Use



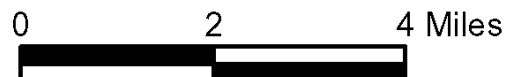
- Agricultural
- Residential
- Vacant
- Commercial
- Recreation and Entertainment
- Community Services
- Industrial
- Public Services
- Wild



Data Sources:

Watersheds - NRCS
 Flood Zones - FEMA
 Municipal Boundaries - NYS DOT
 Tax Parcels with Land Use - Genesee Co. Real Property

- Watersheds
- Municipalities
- Flood Zone



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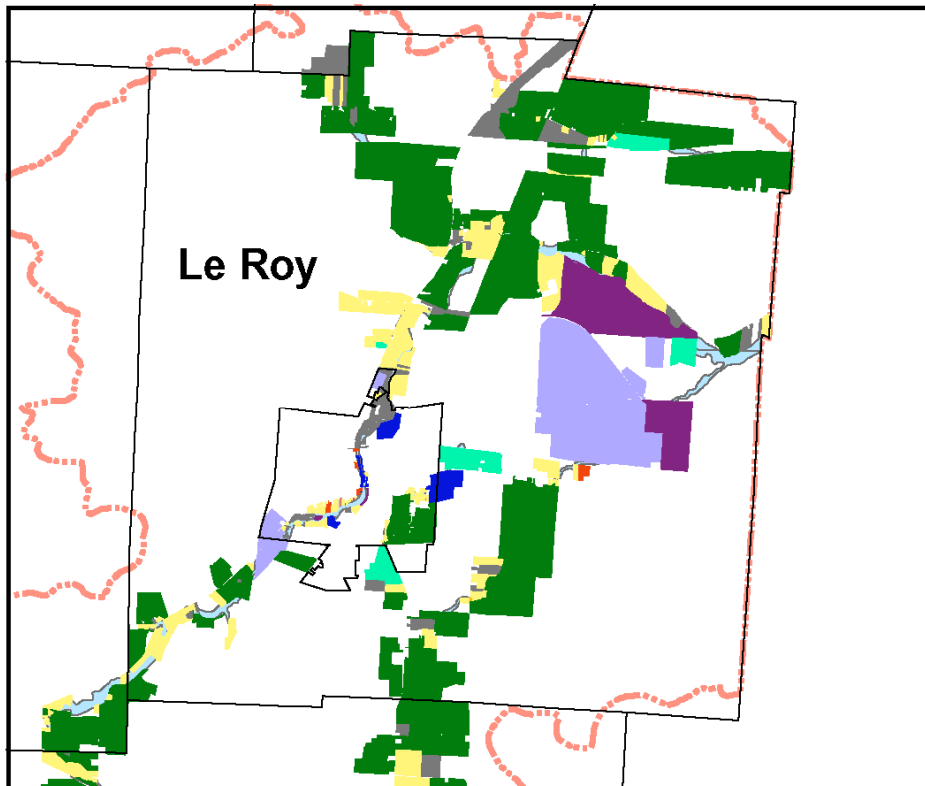
LeRoy

The Town and Village of LeRoy are in eastern Genesee County (see [Map 2.1](#)). Settled in 1797, the Town formed from Caledonia (Livingston County) in 1812 as Bellona; the name was changed the following year. The Village incorporated in 1834, and has had many industrial enterprises, including patent medicine, brooms, crushed stone, salt (1883–1928), Lapp Insulator (1919–), and Union Steel Chest (1932–73). LeRoy Female Seminary, which moved to the village in 1837, was chartered as Ingham University in 1857, the first university for women in the United States; it closed 1891. A documented route of the Underground Railroad can be explored by a 17-mile tour. In 1897 Pearle Wait developed Jell-O. Lacking funds he sold his formula to Orator Woodward who successfully marketed it to make it "America's Most Famous Dessert." Though the Jell-O plant left town in 1964, a Jell-O Museum is open year-round. The annual Oatka Festival is held in July. The Thruway and I-490 (1964) facilitate commuting to Rochester and Batavia.

Approximately 98% of the Town of LeRoy is in the Oatka Creek Watershed and 4% is in the flood zone (see [Table 2.1](#)). Fully 100% of the Village of LeRoy is in the Oatka Creek Watershed and 8% is in the flood zone. In the Town of LeRoy there are a total of 235 real property parcels in the Oatka Creek flood zone in excess of 1,004 acres. The approximate percent of the main land uses are as follows: 49% agricultural, 28% residential, 7% vacant, and 4% industrial (see [Map 2.3h](#)).

Map 2.3h

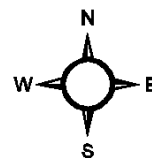
Land Use in the Town of Le Roy in the Oatka Creek Floodplain



Land Use



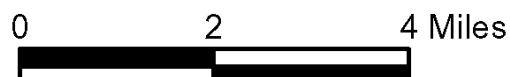
- Agricultural
- Residential
- Vacant
- Commercial
- Recreation and Entertainment
- Community Services
- Industrial
- Public Services
- Wild



Data Sources:

Watersheds - NRCS
 Flood Zones - FEMA
 Municipal Boundaries - NYS DOT
 Tax Parcels with Land Use - Genesee Co. Real Property

- Watersheds
- Municipalities
- Flood Zone

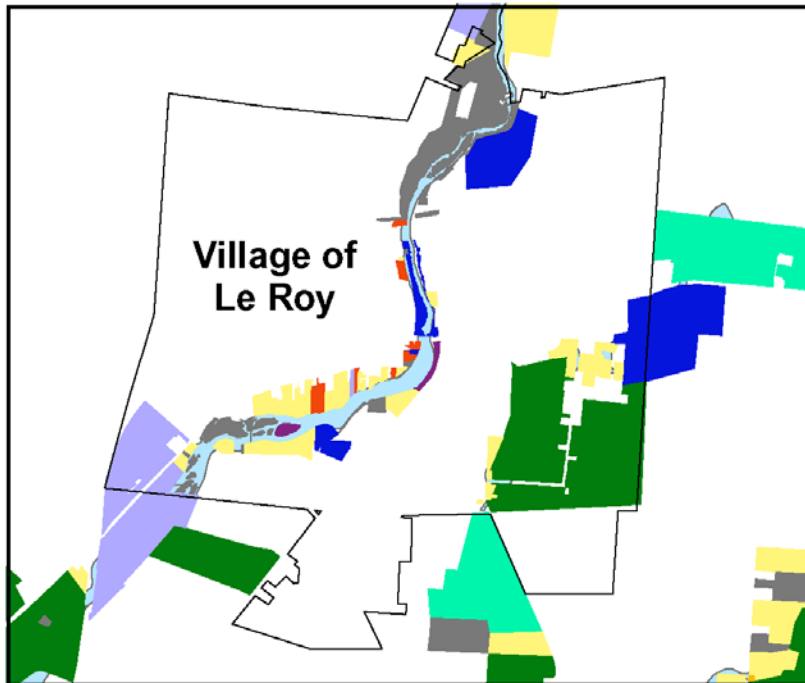


Prepared by Genesee/Finger Lakes Regional Planning Council

The Village of LeRoy is more developed. There are a total of 159 real property parcels in the Oatka Creek flood zone in excess of 82 acres. The approximate percent of the main land uses are as follows: 28% agricultural, 20% residential, 38% vacant, 1% commercial, and 3% industrial (see [Map 2.3i](#)).

Map 2.3i

Land Use in the Village of Le Roy in the Oatka Creek Floodplain

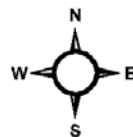


Land Use



GENESEE/FINGER LAKES
Regional Planning Council

- Agricultural
- Residential
- Vacant
- Commercial
- Recreation and Entertainment
- Community Services
- Industrial
- Public Services
- Wild



Data Sources:

Watersheds - NRCS
Flood Zones - FEMA
Municipal Boundaries - NYS DOT
Tax Parcels with Land Use - Genesee Co. Real Property

- Watersheds
- Municipalities
- Flood Zone



Prepared by Genesee/Finger Lakes Regional Planning Council

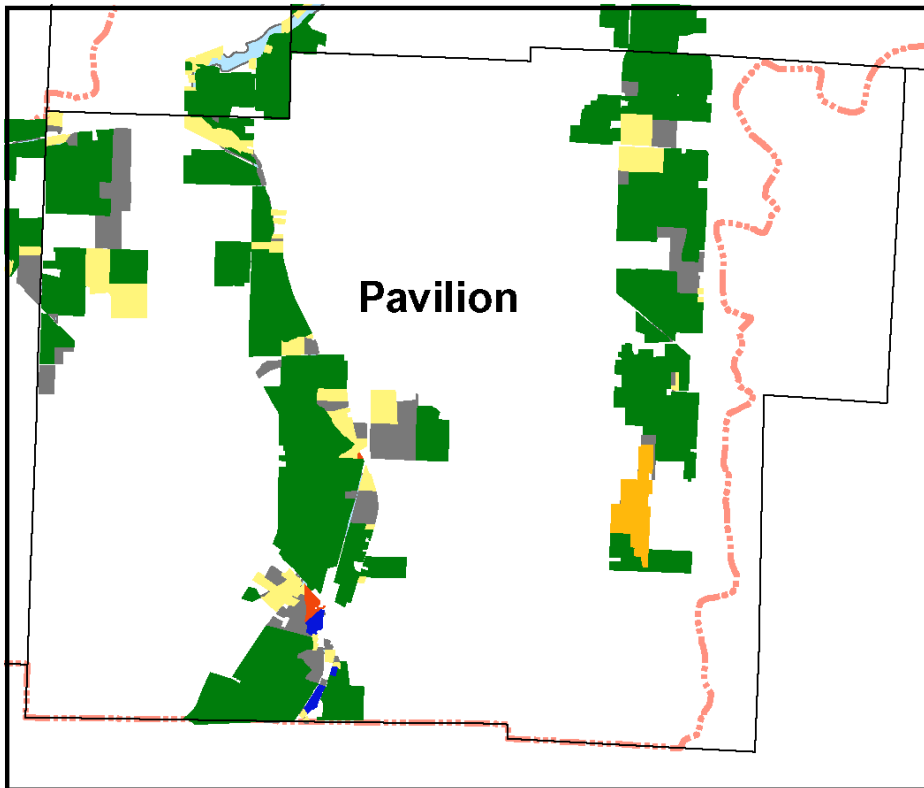
Town of Pavilion

The Town of Pavilion is in southern Genesee County (see [Map 2.1](#)). Settled in 1805 along the state road from Geneseo to Batavia, the town was formed in 1842 from Covington (Wyoming County). Oatka Creek provided power for mills, brick, chair and wagon factories. Natural gas was extracted beginning in 1879, and salt was produced from 1891. The DeWitt Corporation (1923) is a construction firm, which has worked on State projects including Attica State Prison, St. Lawrence Seaway and Mt. Morris Dam; it was sold in 1999 to Hanson Aggregates. The Woodward Tower, a five-story Ribstone silo, was built in 1926 as a party house for the son of the Jell-O promoter.

Approximately 87% of Pavilion is in the Oatka Creek Watershed and 3% is in the flood zone (see [Table 2.1](#)). In the Town of Pavilion there are a total of 191 real property parcels in the Oatka Creek flood zone in excess of 755 acres. The approximate percent of the main land uses are as follows: 67% agricultural, 9% residential, 16% vacant, and 1% commercial (see [Map 2.3j](#)).

Map 2.3j

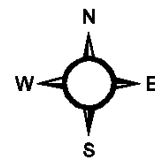
Land Use in the Town of Pavilion in the Oatka Creek Floodplain



Land Use



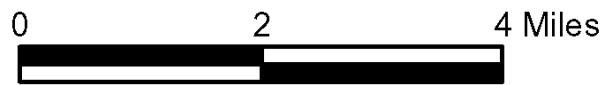
- Agricultural
- Residential
- Vacant
- Commercial
- Recreation and Entertainment
- Community Services
- Industrial
- Public Services
- Wild



Data Sources:

Watersheds - NRCS
 Flood Zones - FEMA
 Municipal Boundaries - NYS DOT
 Tax Parcels with Land Use - Genesee Co. Real Property

- Watersheds
- Municipalities
- Flood Zone



Prepared by Genesee/Finger Lakes Regional Planning Council

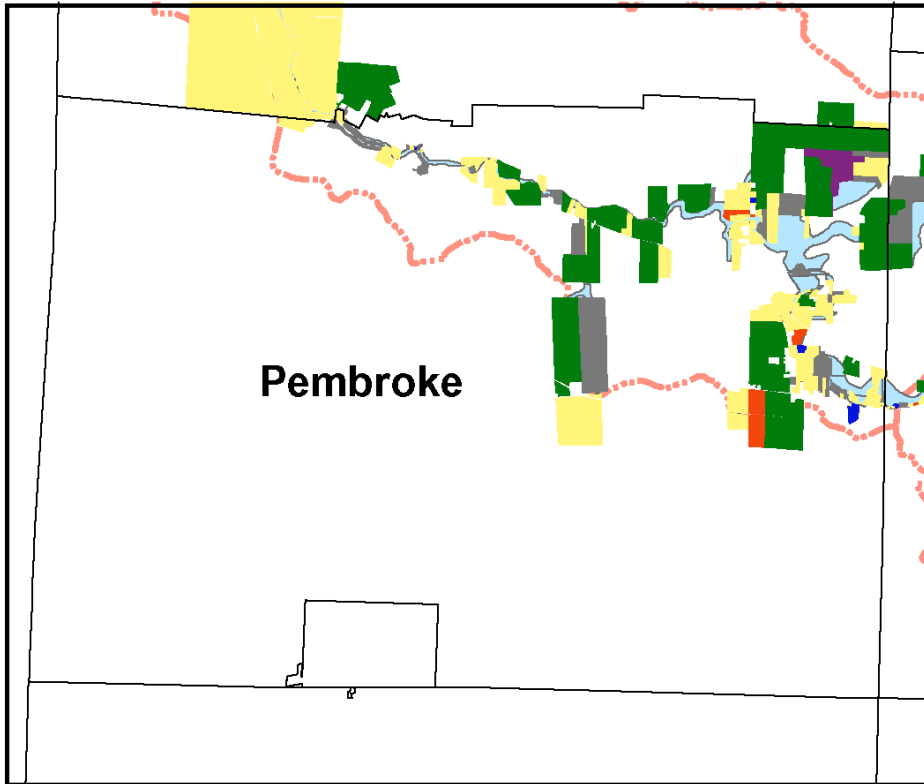
Town of Pembroke

The Town of Pembroke is in western Genesee County (see [Map 2.1](#)). Settled in 1804, the Town was formed from Batavia in 1812. Indian Falls was the birthplace of Ely S. Parker (1828–95), a Tonawanda Seneca who became the first Native American to serve as US Commissioner of Indian Affairs. Boulder Park (1949–70), an amusement park at Indian Falls, featured a carousel and a miniature steam train. Kutter's Cheese Factory (1947) sells its product throughout the northeast. A Pembroke exit of the Thruway (1970's) made commuting to Batavia and Buffalo practical. The Brick House Corners Fair held each September commemorates the Town's history, farms, and crafts.

Approximately 26% of Pembroke is in the Tonawanda Creek Watershed and 3% is in the floodzone (see [Table 2.1](#)). In the Town of Pembroke there are a total of 206 real property parcels in the Tonawanda Creek flood zone in excess of 539 acres. The approximate percent of the main land uses are as follows: 31% agricultural, 33% residential, 24% vacant, and 3% commercial (see [Map 2.3k](#)).

Map 2.3k

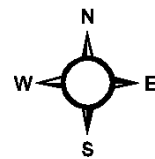
Land Use in the Town of Pembroke in the Tonawanda Creek Floodplain



Land Use



- Agricultural
- Residential
- Vacant
- Commercial
- Recreation and Entertainment
- Community Services
- Industrial
- Public Services
- Wild



Data Sources:

Watersheds - NRCS
 Flood Zones - FEMA
 Municipal Boundaries - NYS DOT
 Tax Parcels with Land Use - Genesee Co. Real Property

- ▬ Watersheds
- Municipalities
- Flood Zone

0 2 4 Miles



Prepared by Genesee/Finger Lakes Regional Planning Council

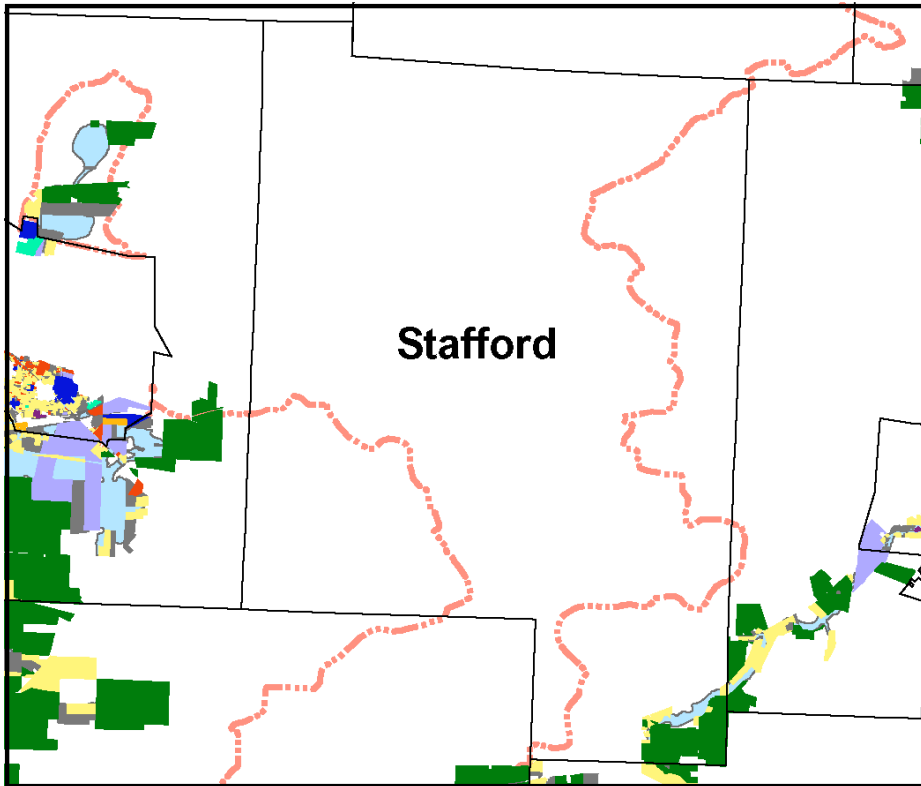
Town of Stafford

The Town of Stafford is in eastern Genesee County (see [Map 2.1](#)). Settled in 1798 with the construction of the Holland Land Company storehouse, it had a strong influx of English people beginning in 1817, including a colony from Devon. The Town was formed from LeRoy and Batavia in 1820. An attempt at silk production was made in 1839. During the last half of the 19th century, Morganville Pottery produced drain tile and flowerpots, as well as glazed wares. Part of the 1984 movie, The Natural, starring Robert Redford, was filmed in the countryside. The Rochester Zen Center built a Buddhist retreat facility in 2000.

Approximately 33% of Stafford is in the Oatka and Tonawanda Creek Watersheds and 3% is in the flood zone (see [Table 2.1](#)). In the Town of Stafford there are a total of 17 real property parcels in the Oatka and Tonawanda Creek flood zones in excess of 51 acres. The approximate percent of the main land uses are as follows: 65% agricultural and 35% residential (see [Map 2.3I](#)).

Map 2.3I

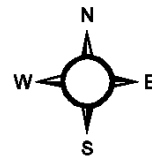
Land Use in the Town of Stafford in the Oatka Creek Floodplain



Land Use



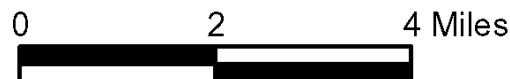
- Agricultural
- Residential
- Vacant
- Commercial
- Recreation and Entertainment
- Community Services
- Industrial
- Public Services
- Wild



- Watersheds
- Municipalities
- Flood Zone

Data Sources:

Watersheds - NRCS
 Flood Zones - FEMA
 Municipal Boundaries - NYS DOT
 Tax Parcels with Land Use - Genesee Co. Real Property



Prepared by Genesee/Finger Lakes Regional Planning Council

Tonawanda Indian Reservation

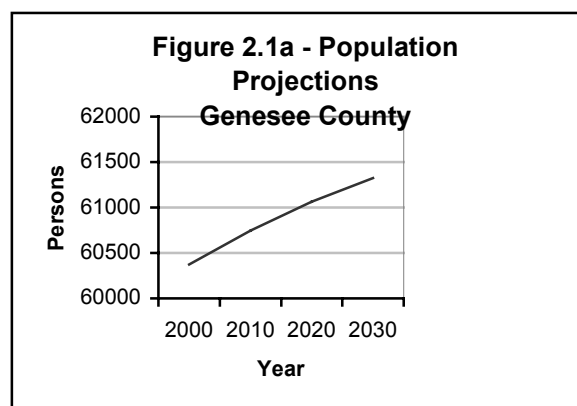
The Tonawanda Indian Reservation is in northwestern Genesee County (see [Map 2.1](#)). Approximately 83% of the Tonawanda Indian Reservation is in the Tonawanda Creek Watershed in Genesee County and over 13% of that is in the flood zone (see [Table 2.1](#)).

Table 2.1 - Land Area, Watershed Area, and Floodplain Area in Genesee County

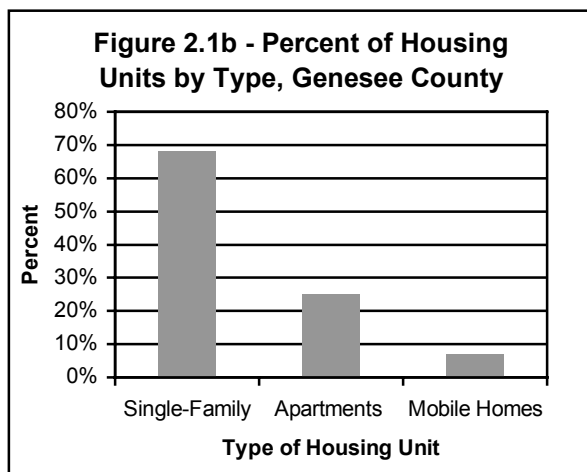
		Total Area*	Watershed	Total Area in Tonawanda and/or Oatka Watersheds	Percent of Municipality in the Watersheds	Total Area in Tonawanda and/or Oatka Flood Zone	Percent of Municipality in the Flood Zone
Alabama**	Town	42.95	Tonawanda	8.64	20.1%	0.48	1.11%
Alexander	Town	35.56	Tonawanda	33.42	94.0%	5.80	16.31%
Alexander	Village	0.44	Tonawanda	0.44	100.0%	0.10	22.99%
Attica	Village (part)	0.2	Tonawanda	0.2	100.0%	0.04	20.23%
Batavia	City	5.27	Tonawanda	4.32	82.0%	1.08	20.42%
Batavia	Town	48.43	Tonawanda	38.23	78.9%	6.28	12.97%
Bethany	Town	36.12	Both	22.54	62.4%	1.37	3.78%
Darien	Town	47.59	Tonawanda	1.09	2.3%	0.08	0.16%
LeRoy	Town	42.15	Oatka	41.43	98.3%	1.87	4.44%
LeRoy	Village	2.67	Oatka	2.67	100.0%	0.20	7.55%
Pavilion	Town	35.79	Oatka	31.3	87.5%	1.20	3.34%
Pembroke	Town	41.79	Tonawanda	10.68	25.6%	1.34	3.20%
Stafford	Town	31.32	Both	10.41	33.2%	0.14	0.46%
Tonawanda Reservation	Indian Reservation	9.1	Tonawanda	7.56	83.1%	1.23	13.54%
* Town figures include any villages contained within; all figures in square miles							
** Excludes the Tonawanda Reservation							

2.2 – Population, Housing, and Socioeconomic Characteristics

The 2000 census stated that the population in Genesee County was 60,370. The following graph shows population projections done by the Genesee/Finger Lakes Regional Planning Council. According to these projections, the population will increase at a steady rate over the next thirty years.



Genesee County had a total of 24,190 available housing units in the year 2000. 68% of those housing units were single-family homes while the remaining 32% were made up of apartments and mobile homes. For the three-year period of 1998-2000, the Town of Batavia issued the most permits for residential development in Genesee County with 77. The Towns of Darien and Pavilion issued the next highest of residential permits at 41 and 40, respectively. The Towns of Batavia, Bergen and Pembroke, the Village of Alexander, and the City of Batavia were the only municipalities to issue permits for multi-family dwellings in the three-year period. The following graph displays the distribution of housing units by type (US Census Bureau).



In 2000, there were 22,770 occupied housing units in the County while 73% were owner occupied. The median value of owner-occupied housing units was \$83,200.

Land has always been the County's greatest asset. The diversity of soils and climate conditions attracted the early settlers who carved out homes and farms, developing Genesee into one of the richest agricultural regions within New York State. Genesee County has the highest percentage of classified farmland in New York State and three of the top 100 vegetable farms in the country. The fertile muck soil in Elba has made Genesee one of the principal counties in the nation for growing beets and onions. Dairy farming is still the leading commodity in the county and over all Genesee is fourth in agriculture sales within New York State.

In addition to the land, Genesee County has been blessed with rich mineral deposits of gypsum, limestone, natural gas and salt. These minerals along with early industries and businesses have enhanced the development of local communities. Today, area firms include a variety of businesses that utilize local energy sources, a network of transportation services and skilled labor (see [Table 2.2](#)).

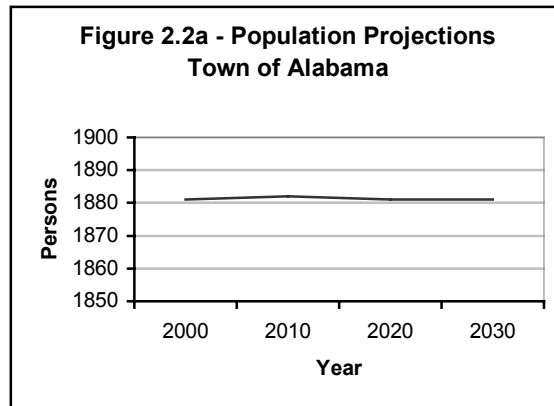
Table 2.2 - Manufacturing/Industrial Sector in Genesee County		
Company	City	Employment #
Chapin Manufacturing, Inc.	Batavia (C) (T)	250
Pepsi-Cola Bottling Corporation/Loose Ends Vending	Batavia (C)	139
Agway Feed & Fertilizer	Batavia (C) (T)	75
Automotive Corporation	Batavia (T)	109
O-AT-KA Milk Products Cooperative, Inc.	Batavia (C) (T)	320
Hodgins Engraving Co., Inc.	Batavia (T)	60
Graham Corporation	Batavia (C)	285
Genesee Precision, Inc.	Batavia (T)	51
Amada Tool America, Inc.	Batavia (C)	64
P.W. Minor & Sons, Inc.	Batavia (C)	250
Holiday Inn	Batavia (T)	55
Tompkins Metal Finishing, Inc.	Batavia (C)	90
CH Wright Distribution Corp.	Batavia (C) (T)	54
Baskets & Moore, Ltd.	Batavia (C)	60
Angelica Textile Services, Inc.	Batavia (C)	200
Western Regional Off-Track Betting Corp.	Batavia (C) (T)	74
Batavia Newspaper Corp.	Batavia (C)	105
Tenney Healthcare Linen Systems	Batavia (C)	68
Eastern Molding International, LLC	Batavia (C)	55
Liberty Pumps, Inc.	Bergen	58
Oxbo International Corp.	Byron	85
Edward Arnold Scrap Processors, Inc.	Corfu	55
Six Flags Darien Lake Theme Park & Camping Resort	Darien Center	85
Kristner Concrete	East Pembroke	107
Lapp Insulator Co., LLC	LeRoy (V)	225
Orcon Industries Corp.	LeRoy (V)	75
AgriLink Foods	Oakfield	61
United States Gypsum Co.	Oakfield	125
Hanson Aggregates	Pavilion	110

Source: Genesee County Industrial Development Agency, 2003

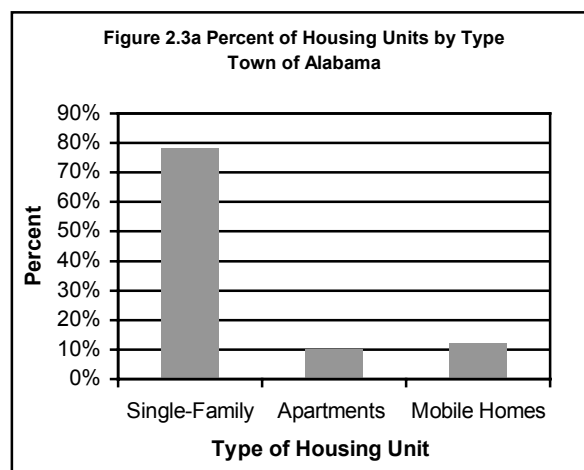
Median household income in 1999 for Genesee County was \$40,542 and per capita income was \$18,498. 12.2 % of the population fell below the poverty level according to the U.S. Census Bureau.

Town of Alabama

The 2000 Census stated that the population in the Town of Alabama was 1,881. The following graph shows population projections done by the Genesee/Finger Lakes Regional Planning Council. According to these projections, the population will remain at a steady rate over the next thirty years.



The Town of Alabama had a total of 766 available housing units. 78% of those housing units were single-family homes while the remaining 22% were made up of apartments and mobile homes. The following graph displays the distribution of housing units by type (US Census Bureau).

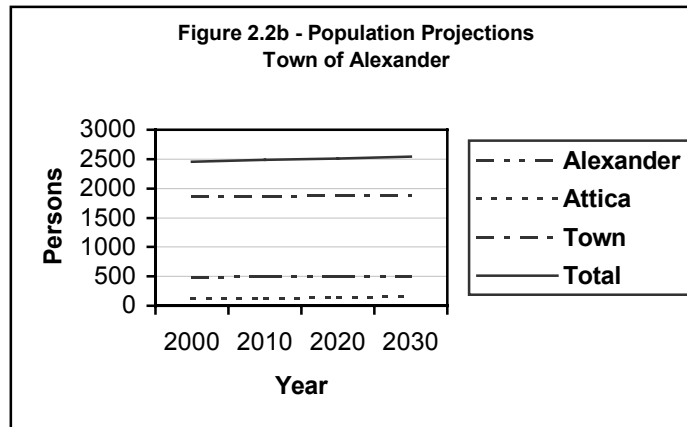


In 2000, there were 663 occupied housing units in the town while 81% were owner occupied. The median value of owner-occupied housing units was \$76,500.

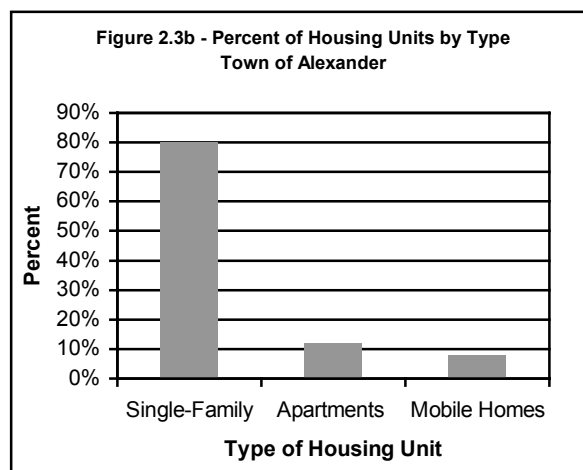
Median household income in 1999 for the Town of Alabama was \$40,223. Per capita income was \$14,811 and 6.3% of the population was below the poverty level.

Alexander

The 2000 Census stated that the population in the Villages of Alexander and Attica was 481 and 118 respectively, with an additional 1,852 people outside the village limits. Therefore, the total population for the Town of Alexander in the year 2000 was 2,451. The following graph shows population projections done by the Genesee/Finger Lakes Regional Planning Council. According to these projections, the population will increase at a slow rate over the next thirty years.



The Town of Alexander had a total of 899 available housing units. 80% of those housing units were single-family homes while the remaining 20% were made up of apartments and mobile homes. The following graph displays the distribution of housing units by type (US Census Bureau).

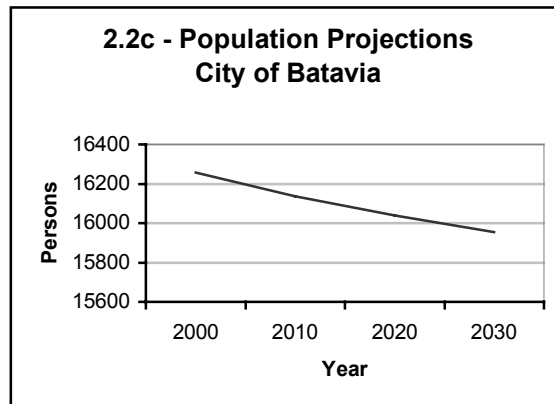


In 2000, there were 172 occupied housing units in the Village of Alexander, 37 in the Village of Attica and 651 more in the town. Of the 860 total occupied housing units, 82% were owner occupied. The median value of owner-occupied housing units was \$79,100.

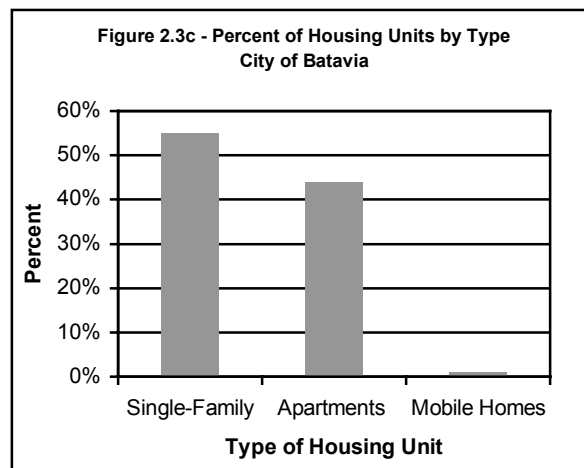
Median household income in 1999 was \$43,500 for the Town, \$51,528 for the Village of Alexander and \$34,028 for the Village of Attica. Per capita income for the Town was \$20,031 and the Town's poverty level was a combined 6.9%. The Village of Alexander's was only 0.8% and the Village of Attica's, within Genesee County, is 40.3%.

City of Batavia

The 2000 Census stated that the population in the City of Batavia was 16,256. The following graph shows population projections done by the Genesee/Finger Lakes Regional Planning Council. According to these projections, the population will steadily decrease over the next thirty years.



The City of Batavia had a total of 6,924 available housing units. 55% of those housing units were single-family homes while the remaining 45% were made up of apartments and manufactured homes. The following graph displays the distribution of housing units by type (US Census Bureau).

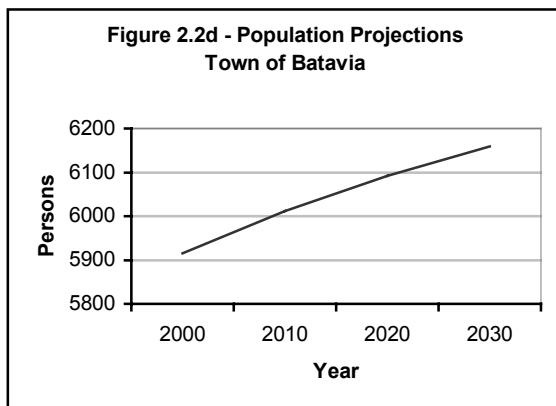


In 2000, there were 6,457 occupied housing units in the City, while 55% were owner occupied. The median value of owner-occupied housing units was \$77,200.

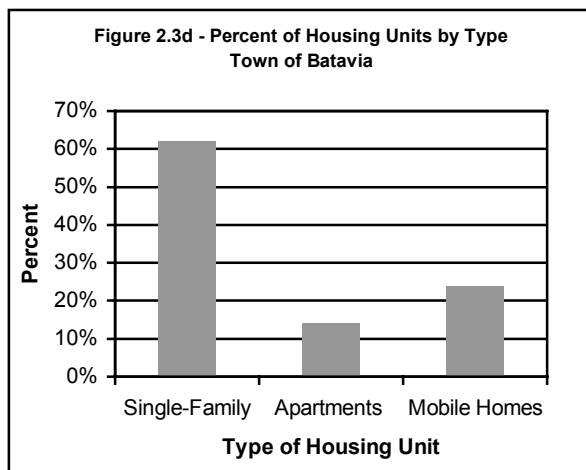
Median household income in 1999 for the City of Batavia was \$33,484. Per capita income was \$17,737 and 12.3% of the population was below the poverty level.

Town of Batavia

The 2000 Census stated that the population in the Town of Batavia was 5,915. The following graph shows population projections done by the Genesee/Finger Lakes Regional Planning Council. According to these projections, the population will increase at a steady rate.



The Town of Batavia had a total of 2,447 available housing units. 62% of those housing units were single-family homes while the remaining 38% were made up of apartments and mobile homes. The following graph displays the distribution of housing units by type (US Census Bureau).

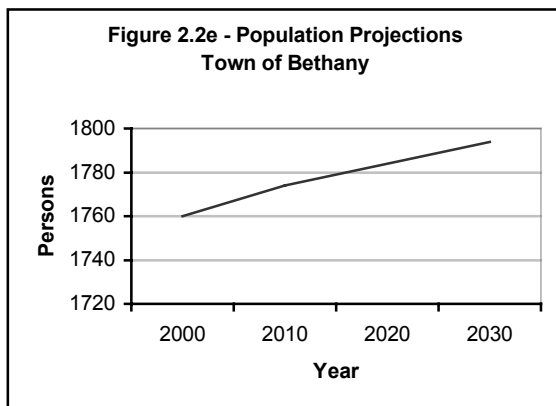


In 2000, there were 2,334 occupied housing units in the Town while 83% were owner occupied. The median value of owner-occupied housing units was \$92,300. The Town of Batavia had the highest number of residential permits issued in Genesee County for the year 2000.

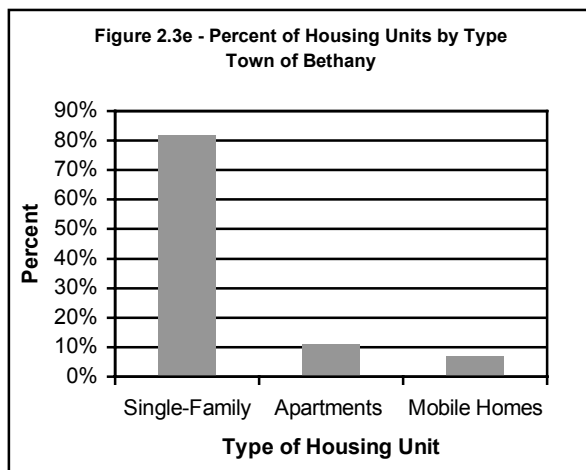
Median household income in 1999 for the Town of Batavia was \$38,449. Per capita income was \$19,563 and 9.6% of the population was below the poverty level.

Town of Bethany

The 2000 Census stated that the population in the Town of Bethany was 1760. The following graph shows population projections done by the Genesee/Finger Lakes Regional Planning Council. According to these projections, the population will increase at a slow rate.



The Town of Bethany had a total of 665 available housing units. 82% of those housing units were single-family homes while the remaining 28% were made up of apartments and mobile homes. The following graph displays the distribution of housing units by type (US Census Bureau).

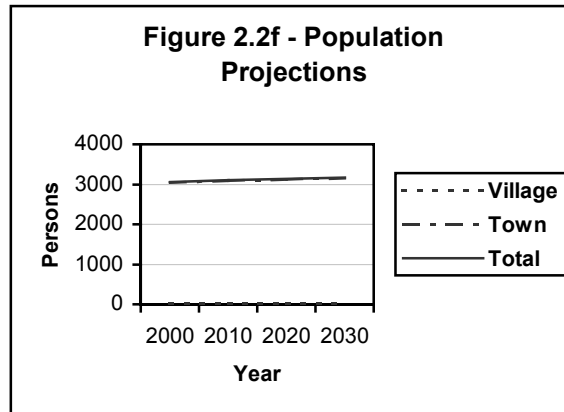


In 2000, there were 636 occupied housing units in the Town while 82% were owner occupied. The median value of owner-occupied housing units was \$82,600.

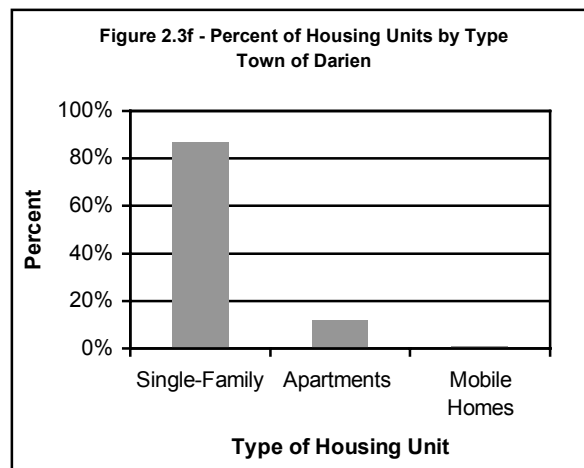
Median household income in 1999 for the Town of Bethany was \$45,450. Per capita income was \$18,693 and 5.1 % of the population was below the poverty level.

Darien

The 2000 Census stated that the population in the Town of Darien outside the Village was 3,048 with an additional population of 13 in the Village of Corfu. Therefore, the total population for the Town of Darien in the year 2000 was 3,061. The following graph shows population projections done by the Genesee/Finger Lakes Regional Planning Council. According to these projections, the population will increase at a slow rate over the next thirty years.



The Town of Darien had a total of 1,119 available housing units. 87% of those housing units were single-family homes while the remaining 13% were made up of apartments and mobile homes. The following graph displays the distribution of housing units by type (US Census Bureau).

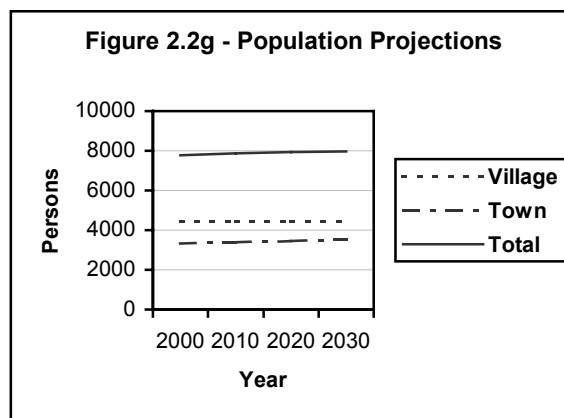


In 2000, there were 5 occupied housing units in the Village and 1,059 more in the Town. Of the 1,064 total occupied housing units, 86% were owner occupied. The median value of owner-occupied housing units was \$87,600.

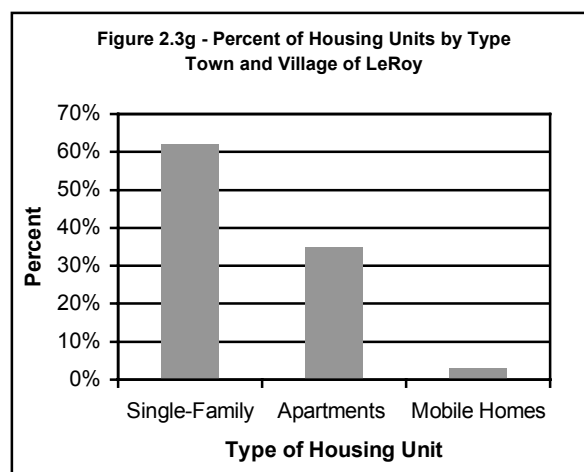
Median household income in 1999 for the Town was \$48,844 and \$43,750 for the village. Per capita income was \$18,372 for the Town and \$3.2% of the Town's population was below the poverty level but no percentage of the Village's population.

LeRoy

The 2000 Census stated that the population in the Town of LeRoy outside the Village was 3,328 with an additional population of 4,462 in the Village of LeRoy. Therefore, the total population for the Town of LeRoy in the year 2000 was 7,790. The following graph shows population projections done by the Genesee/Finger Lakes Regional Planning Council. According to these projections, the population will increase at a slow rate over the next thirty years.



The Town of LeRoy had a total of 3,192 available housing units. 62% of those housing units were single-family homes while the remaining 38% were made up of apartments and mobile homes. The following graph displays the distribution of housing units by type (US Census Bureau).

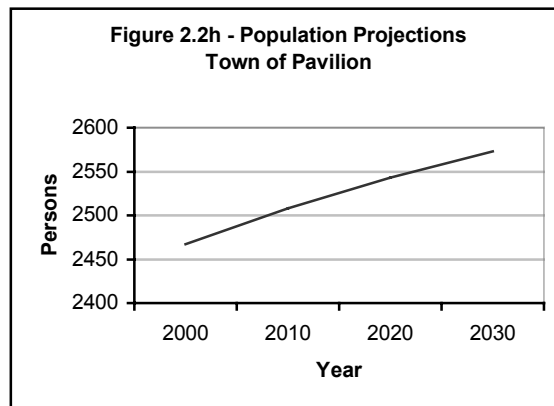


In 2000, there were 1,845 occupied housing units in the Village and 1,192 more in the Town. Of the 3,037 total occupied housing units, 69% were owner occupied. The median value of owner-occupied housing units was \$86,200.

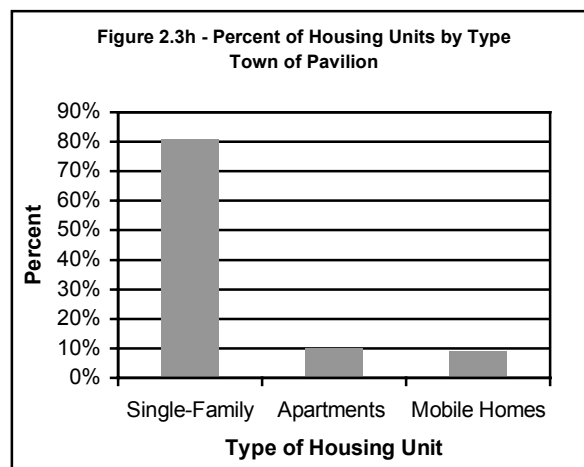
Median household income in 1999 for the Town was \$39,690 and \$33,168 for the Village. Per capita income was \$19,342 for the Town and \$18,565 for the village. 5.6% of the Town's population and 7.3 % of the Village's population was below the poverty level.

Town of Pavilion

The 2000 Census stated that the population in the Town of Pavilion was 2,467. The following graph shows population projections done by the Genesee/Finger Lakes Regional Planning Council. According to these projections, the population will increase at a steady rate over the next thirty years.



The Town of Pavilion had a total of 930 available housing units. 81% of those housing units were single-family homes while the remaining 19% were made up of apartments and mobile homes. The following graph displays the distribution of housing units by type (US Census Bureau).

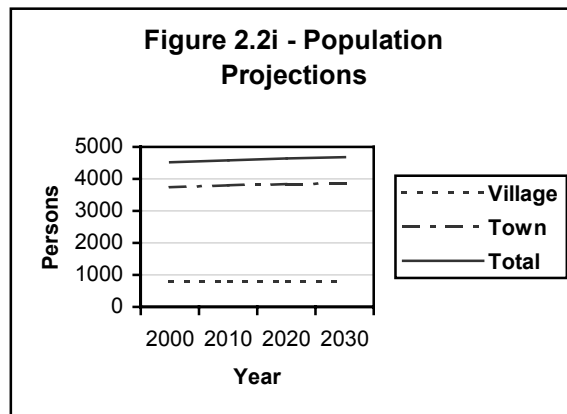


In 2000, there were 886 occupied housing units in the Town while 86% were owner occupied. The median value of owner-occupied housing units was \$83,800.

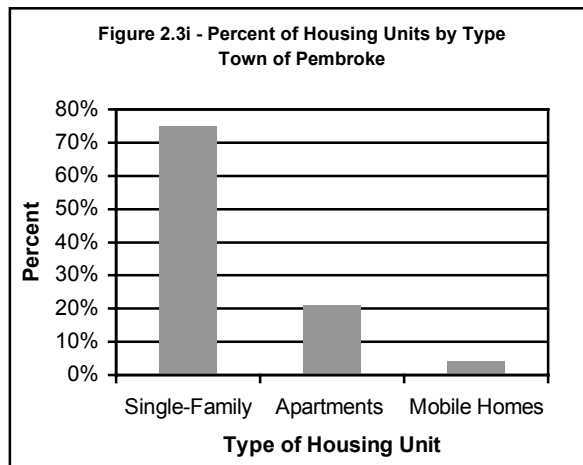
Median household income in 1999 for the Town of Pavilion was \$41,266. Per capita income was \$20,254 and 5.4% of the population was below the poverty level.

Pembroke

The 2000 Census stated that the population in the Town of Pembroke outside of the Village was 3,748 with an additional population of 782 in the Village of Corfu. Therefore, the total population for the Town of Pembroke in the year 2000 was 4,530. The following graph shows population projections done by the Genesee/Finger Lakes Regional Planning Council. According to these projections, the population will increase at a slow rate over the next thirty years.



The Town of Pembroke had a total of 1,772 available housing units. 75% of those housing units were single-family homes while the remaining 25% were made up of apartments and mobile homes. The following graph displays the distribution of housing units by type (US Census Bureau).

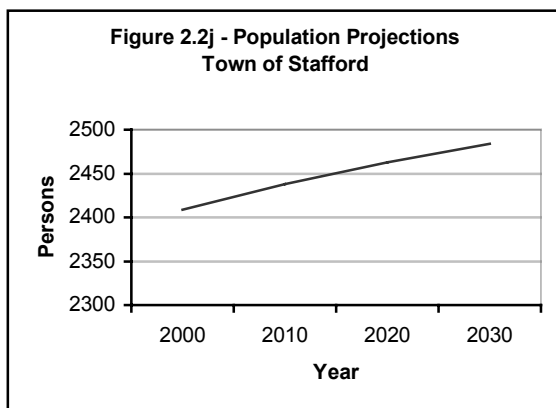


In 2000, there were 304 occupied housing units in the Village and 1,356 more in the Town. Of the 1,660 total occupied housing units, 79% were owner occupied. The median value of owner-occupied housing units was \$91,700.

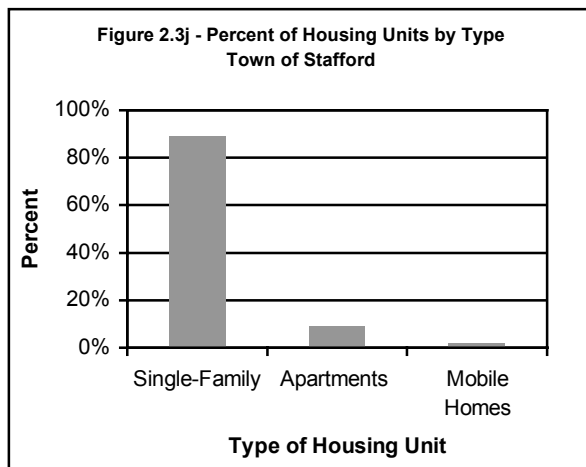
Median household income in 1999 for the Town was \$41,266 and \$37,159 for the Village. Per capita income for the Town was \$17,148 and 4.8 % of the Town's population while 4.2% of the Village's population was below the poverty level.

Town of Stafford

The 2000 Census stated that the population in the Town of Stafford was 2,409. The following graph shows population projections done by the Genesee/Finger Lakes Regional Planning Council. According to these projections, the population will increase at a steady rate over the next thirty years.



The Town of Stafford had a total of 1,024 available housing units. 89% of those housing units were single-family homes while the remaining 11% were made up of apartments and mobile homes. The following graph displays the distribution of housing units by type (US Census Bureau).

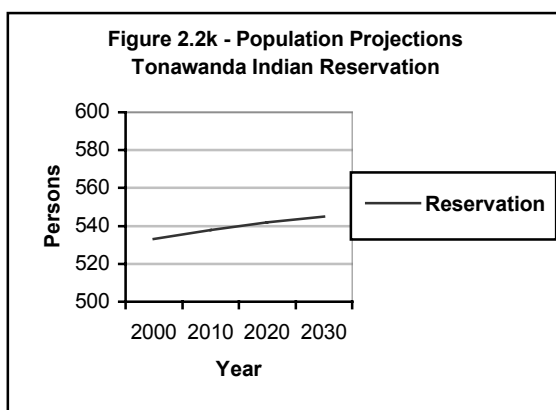


In 2000, there were 909 occupied housing units in the Town while 85% were owner occupied. The median value of owner-occupied housing units was \$85,400.

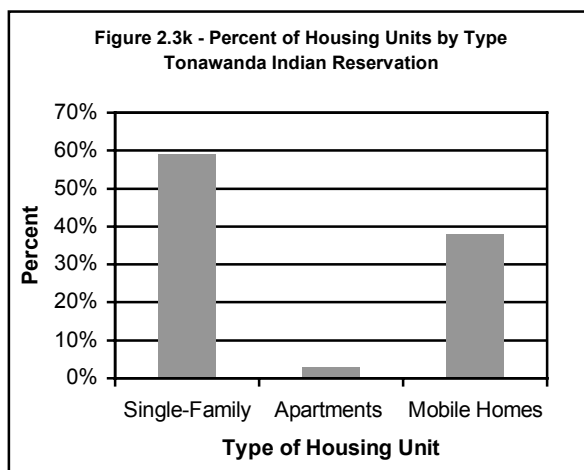
Median household income in 1999 for the Town of Stafford was \$49,516. Per capita income was \$19,775 and 3.7 % of the population was below the poverty level.

Tonawanda Indian Reservation

The 2000 Census stated that the population in the Tonawanda Indian Reservation was 533. The following graph shows population projections done by the Genesee/Finger Lakes Regional Planning Council. According to these projections, the population will increase at a slow rate over the next thirty years.



The Tonawanda Indian Reservation had a total of 130 available housing units. 59% of those housing units were single-family homes while the remaining 41% were made up of apartments and mobile homes. The following graph displays the distribution of housing units by type (US Census Bureau).



In 2000, there were 186 occupied housing units in the Reservation while 87% were owner occupied. The median value of owner-occupied housing units was \$67,100.

Median household income in 1999 for the Tonawanda Indian Reservation was \$25,208. Per capita income was \$ 12,201 and 16.1 % of the population was below the poverty level.

2.3 – Sources of the Flooding Problems

Geography of the Tonawanda and Oatka Creek Watersheds

The geography of the Tonawanda and Oatka Creek watershed basins include a varied physical terrain as well as a unique meteorological situation. These watersheds occupy substantial areas of Genesee and Wyoming Counties and generally flow from south to north.

The morphology of the terrain was heavily influenced by the latest period of glaciation, where substantial amounts of ice moved over the area in a north to south pattern. This movement left deep gashes in the land's surface in the direction of advance and retreat, forming the well-known Finger Lakes and other parallel valleys. Not only were the lakes left as artifacts of the glacial era, but the general stream and drainage pattern was established during this period. Surface water runoff today generally flows in a northerly direction to the Great Lakes, thus ultimately entering the North Atlantic Ocean through the St. Lawrence River.

While this period of glaciation and its subsequent melt smoothed out the land east of Lake Erie and immediately south of Lake Ontario, the gradual foothills of the Appalachians located further south in Western New York continue to be characterized by prominent hills and deep valleys. Steep slopes and higher elevations are common in portions of Wyoming County, and they form the edge of what is known as the Allegheny Plateau. While maximum elevations remain modest in global terms, the difference of several hundred feet between valley floor and hilltops produces dramatic scenery in central and southern Wyoming County.

Since Wyoming County is the origin of both watersheds, an understanding of the localized weather phenomenon of this portion of the region is certainly important. The elevation of Lake Erie is approximately 575 feet, while hills in Wyoming County reach over 2000 feet. This change in elevation can be cited as a major factor contributing to the prevalence of localized weather phenomenon within the Tonawanda and Oatka Creek basins.

The close proximity of Lakes Erie and Ontario to these counties, has a pronounced affect on the regional weather patterns. Prevailing westerly winds blowing over the lakes moderate summer heat but also enhances severe summer thunderstorms and winter snowstorms. The elevation of some areas, particularly Wyoming County, further compounds the lake effect weather. Moist air driven off the lakes is forced east over dry

ground, rising in elevation. The air cools a degree or two as it is forced up in elevation onto the edge of the Allegheny Plateau. Depending on other characteristics of the air mass (such as dew point) and the ground conditions, this cooling often results in sudden precipitation at the higher elevations in Wyoming County. This phenomenon is often referred to as orographic precipitation. Depending on the season, these can be bands of rain or snow whose affect can be very localized.

Such was the case in July 1998 when bands of severe rain moved over the towns of Sheldon and Orangeville in Wyoming County, dumping up to 7 inches of rain within a 24-hour period. While these towns suffered significant flood damage, the steep slopes and high stream gradient caused the water to quickly drain northward down the Tonawanda Valley. Though rainfall in Attica was not severe, flooding was. Attica is at the northern edge of Wyoming County where the Allegheny Plateau begins to flatten out toward the Ontario Lake Plain. The gradient of the creek decreased, water slowed down, spread out, and low-lying areas were flooded.

Tonawanda Creek

The Tonawanda Creek watershed encompasses approximately 648 square miles (U.S. Army Corps of Engineers, 1983) in Western New York. The stream originates in the Cattaraugus Hills in Wyoming County, flowing northward approximately 22 miles to the Village of Attica, on the Genesee County line. Tonawanda Creek enters Genesee County with a top of bank elevation of approximately 950 feet above sea level in the Town of Alexander (USGS., Attica, NY 7.5' Topographic Map, 1978). From Attica, the main channel of Tonawanda Creek flows generally north through the Town and Village of Alexander, and turning westward at Kibbe Park, in the City of Batavia. The U.S. Geological Survey (USGS) maintains a gauging station in Batavia, on the north bank of the Creek about 500 feet east of the Walnut Street Bridge. The elevation at this gauging station is 888 feet (USGS., Batavia South, NY 7.5' Topographic Map, rev. 1978). From this point, the channel flows westerly through the City and Town of Batavia, and a portion of the Town of Pembroke. The channel again turns north at Indian Falls in the Town of Pembroke, flowing generally north-northwest through Tonawanda Indian Reservation and on into Erie County. The channel elevation near Route 77 in Indian Falls is approximately 800 feet above sea level.

Numerous small- and medium-sized tributaries flow into the main channel of Tonawanda Creek between the Village of Attica (Wyoming County) and the City of Batavia. In this reach, the creek channel meanders across a broad flood plain ranging in width from approximately one to three miles, reaching its widest point just south of the City of Batavia.

Major tributaries of Tonawanda Creek in Genesee County include Little Tonawanda Creek and Bowen Creek. Little Tonawanda Creek originates in Wyoming County in the Town of Middlebury, flowing north and northwesterly through the Towns of Bethany, Alexander and Batavia until it forms a confluence with the main channel of Tonawanda Creek approximately two miles south of the City of Batavia. Bowen Creek originates in

the northwest quadrant of the Town of Alexander. It flows northeasterly, joining the main channel of Tonawanda Creek approximately 830 feet west of Hartshorn Road in the Town of Batavia.

Although the gradient of Tonawanda Creek is generally quite steep in Wyoming County, it flattens out between Attica and the City of Batavia. The Army Corps of Engineers (ACE) noted in its 1983 study that this reach of Tonawanda Creek has limited channel capacity, and low height of the banks. The area of the Tonawanda Creek floodplain between Alexander and Batavia is generally known as “The Flats”.

The northern portion of the Village of Attica lies within Genesee County. Areas that have sustained damage in the Genesee County portion of the Village of Attica include commercial properties and Village wastewater treatment plant on Prospect Street. Two people were killed during the 1998 flood in the Village of Attica.

In the Town of Alexander, flooding affects residences on Maplewood and Genesee Streets, and municipal infrastructure in the Village. Log jams and debris accumulate around the piers of the Railroad Avenue Bridge over Tonawanda Creek. Flooding may result from accumulation of debris in culverts under abandoned and active railroad beds in the Towns of Alexander and Batavia. The responsibility for removing this debris is often unclear, depending upon the ownership of the right of way.

In the Town of Batavia, ice jams develop in sharp bends in the Tonawanda Creek channel at Kibbe Park and near Wortendyke Road, flooding roads and damaging properties and structures. While ice jamming is a seasonal problem, the flooding is generally more widespread because the jams tend to develop during high flow events.

Log jams and woody debris obstruct the stream channel of Little Tonawanda Creek near Linden Road and Mill Road in the Town of Bethany. These obstructions cause localized flooding during high flow events and often affect residences located near the stream channel, requiring evacuation of occupants.

In the City of Batavia, overbank flooding affects low-lying residential areas along Law Street and Walnut Street. Frequent overbank flooding also affects single-family residences and trailer parks located in the flood plain south of Route 5 west of the City of Batavia. In localized areas, this flooding may be made worse by the accumulation of woody debris and silt bars in the channel.

Maps of the floodplain included in this report (see [Map 4.1](#)) display a generalized 100-year floodplain and floodway area for Genesee County. The 100-year floodplain is the area subject to inundation by water as a result of a flood that has a one-percent chance of occurring in any given year. These maps were prepared from digitized copies of flood hazard boundary maps and flood insurance rate maps available for the project area.

According to the Federal Emergency Management Agency (FEMA), the floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood (also referred to as the intermediate regional flood or base flood) can be carried without substantial increases in flood heights.

Oatka Creek

Oatka Creek enters Genesee County from its southern border in the Town of Pavilion north of Kelly Road at an elevation between 930 and 940 feet above sea level. The main channel of Oatka Creek flows north and northwesterly to a point about 3.2 miles north of the Village of LeRoy, where it flows easterly into Monroe County, east of Hibbard Road. Within Genesee County, Oatka Creek flows through the Towns of Pavilion and LeRoy. The spillway elevation at the Route 5 dam on Oatka Creek is 864 feet above sea level. At the top of Buttermilk Falls, north of the Village of LeRoy, the elevation is approximately 750 feet above sea level, falling to a top-of-bank elevation of approximately 620 feet at the Genesee-Monroe County Line.

Major tributaries of Oatka Creek in Genesee County include White Creek and Mud Creek. White Creek originates at the foot of Skunk Hill in the Town of Pavilion at an elevation of approximately 1050 feet. It flows north and east through the Towns of Bethany and LeRoy, forming a confluence with Oatka Creek in a large wetland approximately 3 miles southwest of the Village of LeRoy. The watershed of White Creek is sparsely settled and is characterized by numerous wetlands. No flooding issues have been associated with White Creek.

Mud Creek originates near the crossroads of Boyds Corners in the Town of Covington in Wyoming County at an elevation of approximately 1175 feet. It flows north through the towns of Pavilion and LeRoy, joining the main channel of Oatka Creek approximately three miles east of the Village of LeRoy. The Village of LeRoy maintains a reservoir on Mud Creek in the Town of Pavilion.

Flood damage along Oatka Creek has been noted in the hamlet of Pavilion, where municipal buildings, residences, industrial property and agricultural fields are located in a broad, flat floodplain adjacent to the creek. In this instance, woody debris accumulates in the creek channel, restricting the flow volume and causing bank undercutting and erosion. During the July 1998 flood event, this area was flooded, and homes, businesses and municipal buildings were affected. Stream bank erosion has also affected productive agricultural lands along Oatka Creek between Route 63 and Route 20.

Flooding problems have also been described in the northwest portion of the Village of LeRoy and adjacent areas of the Town of LeRoy. The source of these flooding problems is an unnamed tributary of Oatka Creek that originates approximately 0.8 mile south of Route 5 west of the Village of LeRoy. This stream originates as two tributaries that form a confluence south of Route 5. From this point the stream is piped under Route 5, and through the Rite-Aid parking lot. According to local officials, localized

flooding occurs in the parking lots of newer development as a result of storm water surcharging the pipe carrying this unnamed tributary. Flooding problems have been exacerbated in this area due to an increase in the amount of impervious surface (parking lots and large buildings) in recent years. Flooding is also made worse by the presence of already undersized culverts under the CSX tracks and the former Lackawanna railroad bed. The Village has recently constructed a new 30 inch storm sewer pipe to remove some of the excess stormwater.

Seasonal flooding due to ice jamming and debris in Oatka Creek also affects residences, outbuildings, and agricultural properties on Oatka Trail, Wilcox Road and Parmelee Road in the Town of LeRoy.

Siltation from the 1972 Hurricane Agnes flood affected water filters at the Village of Leroy Water Treatment Plant and in the reservoir on Mud Creek in the Town of Pavilion. Some minor flooding problems have also been reported on the LeRoy Country Club property adjacent to Mud Creek. These problems have generally been caused by the accumulation of woody debris in the channel of Mud Creek, and accumulation of debris in road culverts.

Significant sediment bars have also developed in the channel of Oatka Creek west of the Munson Street dam in the Village of LeRoy. Visual observation of the Munson Street dam showed numerous leaks during high flow events in the spring of 2003. An interview with the former Village Superintendent of Public Works indicated that this structure has not been maintained for many years, and that ownership of the structure is unclear.

Maps of the floodplain included in this report (see [Map 4.1](#)) display a generalized 100-year floodplain and floodway area for Genesee County. The 100-year floodplain is the area subject to inundation by water as a result of a flood that has a one-percent chance of occurring in any given year. These maps were prepared from digitized copies of flood hazard boundary maps and flood insurance rate maps (FIRMs) available for the project area.

2.4 – A Brief History of the Flooding Problems

Oatka Watershed

The Oatka Watershed has a history of annual flooding where the Oatka Creek flows through regions of Genesee County and Wyoming County. Floods can be expected yearly between late winter and throughout the spring. Severe flooding during this season is commonly the result of heavy rains.

In addition to climate conditions, geographic factors of the watershed create interconnected weather patterns along the Creek. Flooding frequently begins where the Oatka Creek flows through Warsaw, which lies on lowland especially susceptible to flooding due to runoff waters from the nearby East Hills. As the Creek continues north

and then east through Genesee County, there is potential for flooding along its banks in the Towns of Pavilion and LeRoy.

The most severe recorded Oatka Creek floods have occurred in July 1902, throughout the spring of 1916, June 1928, March 1942, March 1955, March 1973, February 1984, and July 1998.

Newspapers reported the flood of July 1902 at biblical proportions, alluding to the story of Noah. Damage was extreme; “nearly every bridge... all along the Oatka and its tributaries was either carried away or damaged to such an extent that they are unsafe.” (*The Western New-Yorker*, July 11, 1902). The flood was caused by the combination of heavy rain with the bursting of three local reservoirs located north of Warsaw. Flooding may have been worsened by the loss of vegetation on the surrounding hills due to salt mining activities in the previous decades.

There would be two instances of especially severe Oatka Creek flooding during spring of 1916. The first instance occurred in April of 1916. Conditions in Warsaw were especially extreme because of a threefold combination of heavy rain, the Buffalo Street bridge acting as an inadvertent dam, and the improper drainage of rainwater into lower areas of Warsaw from nearby East Hill. Warsaw’s water ran downstream, creating a severe region-wide flood. The flood initiated proposals to get rid of the Buffalo Street Bridge and to re-route the gully on East Hill.

May of 1916 was the date of the second occurrence of severe floods within the year. A brief, but intense rainfall was cited as the worst that Pavilion had ever recorded, and was severe enough to close all BR&P trains into LeRoy (*The Western New Yorker*, May 18, 1916). Severe floods resulted in water build-ups as much as eight feet deep. The intensity of the flood was due to heavy rainfall in Covington coupled with East Hill run-off water of heavy rains into Warsaw.

In March of 1955, the combination of melting snow with heavy rain led to flooding so severe that the Red Cross was called in to help with damages. Warsaw was hit especially hard; Buffalo Street was again inundated.

In 1966, the Buffalo District’s ACE initiated a public project to enlarge the Oatka Creek to maximize flood protection. The project was completed in 1968. A 1972 estimate by the ACE reported that the project had prevented an estimated \$1 million in damages since its completion. (*The Batavian Daily News*, July 11, 1972)

1972’s flood season was impacted by Hurricane Agnes and was one of the worst incidents of Oatka Creek flooding. As weather conditions worsened due to heavy rainfall, the Mt. Morris Dam (southwest of Warsaw) threatened to burst. Residents in low areas between Mt. Morris and as far north as Rochester were evacuated as a precaution. Luckily, water was systematically released from the dam, and calamity was avoided (*The Western New-Yorker*, June 27, 1972). However, more than twenty bridges within the watershed were washed away, and the area between Warsaw and

Wyoming were especially flooded. East Hill run-off water resulted in excessive flooding in Warsaw. Among groups that assisted with repercussions of the rain included the Civil Defense and the National Guard watching water levels around the area, the Attica Correctional Institute gathering 200 volunteers to assist with cleanup, and the Red Cross assisted individuals with personal losses sustained from the flood.

In 1998, heavy rains caused severe floods in January and again in mid-July. January's floods were additionally complicated by an ice storm. Conditions in July were so severe that a state of emergency was declared for five days, and roads were closed throughout a range of areas along the watershed due to flooding.

Tonawanda Creek Watershed

The Tonawanda Watershed has a history of annual flooding where the Tonawanda Creek flows through regions of Genesee County and Wyoming County. Floods can be expected yearly between late winter and throughout the spring. Severe flooding during this season is commonly the result of combinations of heavy rains and melting ice or snow.

In addition to climate conditions, geographic factors of the watershed create highly interconnected weather patterns along the Creek. Although the headwaters of the Tonawanda are in the hills of southern Wyoming County, flooding frequently begins where the Tonawanda Creek flows through Attica, as this is where the channel gradient starts to flatten out. As the Creek continues north and west through Genesee County, there is potential for flooding along its banks in the towns of Alexander and Batavia. Thus, flood conditions in Attica act as good predictors of later conditions in areas downstream. Generally, runoff water from Attica can be expected to reach Batavia within 12 to 24 hours.

Lowlands are the most easily flooded areas along the Tonawanda. These include the lowlands between Attica and Alexander and the lowlands between Batavia and Alexander.

The most severe recorded Tonawanda Creek floods have occurred in March and July 1902, throughout the spring of 1916, in January 1929, the defining flood of March 1942 that initiated significant public interest in flood prevention, in June 1989, and in January and July of 1998.

An ice jam at the Chestnut Street Bridge in March 1902 was cause of the first significant recorded flood in the region. In Batavia, West and South Main Streets were completely submerged under water, and were navigable only by boat. As water receded, piles of ice left behind on the street were recorded at up to 16 feet tall (*Batavia Daily News*, March 1, 1902). Supports for the Walnut Street and Chestnut Street Bridges in Batavia were carried away, and the bridges almost did not persevere through the weather. A second major flood of the year would occur in July 1902.

In the spring of 1916, Tonawanda Creek overflows created five significant floods within four months. Recorded as Batavia's greatest flood to the time, March 1916's waters were made severe by the combination of rain with melting snow. Late April brought the second major flood of the Tonawanda in 1916, made more extreme in Alexander and Batavia by the effects of floods upstream. Less than a month later, in mid-May 1916, the third flood of the year would prove the most severe. The New York Central Railroad running through Alexander was cut off, and over two feet of water was reported in Attica. Early June would be the setting for a fourth flood, and early July would be the fifth significant flood of the season. The intense floods of 1916 would lead to the first public discussion of government intervention for flood protection. Although it would never be implemented, a "gravity water system" was proposed in March 1918.

The end of January 1929 was the next case of severe flooding. Flooding in Attica acted as the precipitator of more severe situations in Alexander and Batavia. Greater than the flood of 1902, the rise of water in Batavia became the Town's new high record. The intensity of the flood inspired more talks about the proposed gravity water system and other calls for government relief that had lain dormant since 1918.

The flood in March 1942 was a defining event for the region. Attica was cited as enduring "normal flooding," while effects in Batavia were extreme. (*Batavia Daily News*, March 19, 1942) The additional complication of the Little Tonawanda Creek overflow would lead to a new record flood level for the City of Batavia. Many residents in the southwestern part of the City of Batavia were stranded in their homes for more than three days. Sewers ran at capacity, flooding over a thousand residential basements and incapacitating many houses' heating and fuel sources. The American Red Cross was called in to help deal with repercussions of the flood. In addition to giving temporary aid to flood victims, the American Red Cross found the need to create a permanent agency to deal with the ongoing flood problems of the Tonawanda Creek. Stunned to see a flood of such magnitude and inconvenience, residents prompted public discussion that led to mandates for national government aid for their region. Although conditions were not severe enough to gain national attention, sufficient constituent demand continued, turning flood relief and prevention into local government topics with priority status.

By 1955, an official flood prevention plan was enacted by the Buffalo District's ACE; areas of the Tonawanda Creek within the city limits of Batavia were widened, and a large wall was erected. The plan estimated protecting from 87 to 88 percent of annual flood damages (*Batavia Daily News*, October 9, 1953). The flood season of 1956 acted as a test of the project's utility; residents of Batavia deemed the project a success and called for further undertakings. However, the construction in Batavia increased the intensity of flooding in places down-stream, and western municipalities such as Pembroke were upset with the changes.

Throughout the 1950s, the 1960s, and the 1970s, the ACE continued with various studies and proposals for further flood prevention plans. Some studies focused on the area between Bushville and Batavia, some focused on the area between Alexander and

Batavia, and other plans called for work on the western part of the City of Batavia. Conflicting ideas and constant underlying banter about how to obtain funding left the Creek neglected during this period.

Late June 1989 was the next major instance of flooding along the Tonawanda. A state of emergency was declared in Genesee County after enduring several flash floods. Multiple bridges were destroyed, including two in Alexander. Damages were severe enough that Governor Mario Cuomo requested federal emergency loans for farmers in both Genesee and Wyoming Counties.

The most recent defining flood season of the Tonawanda Creek was in 1998. In January, Tonawanda Creek flooding affected areas within its watershed in large parts of both Genesee County and Wyoming County. Regions of Wyoming County were declared eligible for federal aid in July 1998 following more severe flooding.

The annual flooding of the Tonawanda continues. As recently as March 21, 2003, flooding of the Creek forced road closings in Alexander. The *Batavia Daily News* alluded to the inevitability of the flooding of the Tonawanda by dismissing its gravity as merely a “rite of spring, up there with geese flying south and robins showing up in the yard.” (*Batavia Daily News*, March 22, 2003)

2.5 Federal, State and Local Regulation

2.5.1 Federal Regulation

National Flood Insurance Act - 1968

The U.S. Congress established the National Flood Insurance Program (NFIP) with the passage of the National Flood Insurance Act of 1968. The NFIP is a Federal program enabling property owners in participating communities to purchase insurance as a protection against flood losses in exchange for State and community floodplain management regulations that reduce future flood damages. Participation in the NFIP is based on an agreement between communities and the Federal Government. If a community adopts and enforces a floodplain management ordinance to reduce future flood risk to new construction in floodplains, the Federal Government will make flood insurance available within the community as a financial protection against flood losses. This insurance is designed to provide an insurance alternative to disaster assistance, thus reducing the escalating costs of repairing damage to buildings and their contents caused by floods.

The primary purposes of the National Flood Insurance Act are to:

- Better indemnify individuals for flood losses through insurance;
- Reduce future flood damages through State and community floodplain management regulations; and
- Reduce Federal expenditures for disaster assistance and flood control.

Community Participation

Section 1315 is a key provision that prohibits the Federal Emergency Management Agency (FEMA) from providing flood insurance unless the community adopts and enforces floodplain management regulations that meet or exceed the floodplain management criteria established in Section 1361(c) of the Act. These floodplain management criteria are contained in 44 Code of Federal Regulations (CFR) Part 60, Criteria for Land Management and Use. The emphasis of the NFIP floodplain management requirements is directed toward reducing threats to lives and the potential for damages to property in flood-prone areas. Over 19,700 communities presently participate in the NFIP. These include nearly all communities with significant flood hazards.

When the NFIP was created, the U.S. Congress recognized that insurance for “existing buildings” constructed before a community joined the Program would be prohibitively expensive if the premiums were not subsidized by the Federal Government. Congress also recognized that most of these flood-prone buildings were built by individuals who did not have sufficient knowledge of the flood hazard to make informed decisions. Under the NFIP, “existing buildings” are generally referred to as Pre-FIRM (Flood Insurance Rate Map) buildings. These buildings were built before the flood risk was known and identified on the community’s FIRM. Currently about 26 percent of the 4.3 million NFIP policies in force are Pre-FIRM subsidized compared to 70 percent of the policies being subsidized in 1978.

In exchange for the availability of subsidized insurance for existing buildings, communities are required to protect new construction and substantially improved structures through adoption and enforcement of community floodplain management ordinances. The 1968 Act requires that full actuarial rates reflecting the complete flood risk be charged on all buildings constructed or substantially improved on or after the effective date of the initial FIRM for the community or after December 31, 1974, whichever is later. These buildings are generally referred to as “Post-FIRM” buildings.

The authors of the original study of the NFIP thought that the passage of time, natural forces, and more stringent floodplain management requirements and building codes would gradually eliminate the number of Pre-FIRM structures. Nevertheless, modern construction techniques have extended the useful life of these Pre-FIRM buildings beyond what was originally expected. However, their numbers overall continue to decrease. The decrease in the number of Pre-FIRM buildings has been attributed to a number of factors such as, severe floods in which buildings were destroyed or substantially damaged, redevelopment, natural attrition, acquisition of flood damaged structures, as well as flood control projects.

Mapping Floodplains

In addition to providing flood insurance and reducing flood damages through floodplain management regulations, the NFIP identifies and maps the Nation's floodplains. Mapping flood hazards creates broad-based awareness of the flood hazards and provides the data needed for floodplain management programs and to actuarially rate new construction for flood insurance.

Flood Disaster Protection Act - 1973

Early in the NFIP's history, the Federal Government found that providing subsidized flood insurance for existing buildings was not a sufficient incentive for communities to voluntarily join the NFIP nor for individuals to purchase flood insurance. Tropical Storm Agnes in 1972, which caused extensive riverine flooding along the east coast, proved that few property owners in identified floodplains were insured. This storm cost the Nation more in disaster assistance than any previous disaster. For the Nation as a whole, only a few thousand communities participated in the NFIP and only 95,000 policies were in force.

As a result, Congress passed the Flood Disaster Protection Act of 1973. The 1973 Act prohibits Federal agencies from providing financial assistance for acquisition or construction of buildings and certain disaster assistance in the floodplains in any community that did not participate in the NFIP by July 1, 1975, or within 1 year of being identified as flood-prone.

Additionally, the 1973 Act required that Federal agencies and federally insured or regulated lenders had to require flood insurance on all grants and loans for acquisition or construction of buildings in designated Special Flood Hazard Areas (SFHAs) in communities that participate in the NFIP. This requirement is referred to as the Mandatory Flood Insurance Purchase Requirement. The SFHA is that land within the floodplain of a community subject to a 1 percent or greater chance of flooding in any given year, commonly referred to as the 100-year flood.

The Mandatory Flood Insurance Purchase Requirement, in particular, resulted in a dramatic increase in the number of communities that joined the NFIP in subsequent years. In 1973, just over 2,200 communities participated in the NFIP. Within 4 years, approximately 15,000 communities had joined the Program. It also resulted in a dramatic increase in the number of flood insurance policies in force. In 1977, approximately 1.2 million flood insurance policies were in force, an increase of almost 900,000 over the number policies in force in December of 1973.

Nation Flood Insurance Reform Act - 1994

Following the multi-billion dollar flood disaster in the Midwest in 1993, Congress enacted the National Flood Insurance Reform Act, which amended the 1968 Act and the 1973 Act. The 1994 Act included measures, among others, to:

- Increase compliance by mortgage lenders with the mandatory purchase requirement and improve coverage;
- Increase the amount of flood insurance coverage that can be purchased;
- Provide flood insurance coverage for the cost of complying with floodplain management regulations by individual property owners (Increased Cost of Compliance coverage);
- Establish a Flood Mitigation Assistance grant program to assist States and communities to develop mitigation plans and implement measures to reduce future flood damages to structures;
- Codify the NFIP's Community Rating System; and
- Require FEMA to assess its flood hazard map inventory at least once every 5 years.

Funding for the NFIP is through the National Flood Insurance Fund, which was established in the Treasury by the 1968 Act. Premiums collected are deposited into the fund, and losses and operating and administrative costs are paid out of the fund. In addition, the Program has the authority to borrow up to \$1.5 billion from the Treasury, which must be repaid along with interest. Until 1986, Federal salaries and program expenses, as well as the costs associated with flood hazard mapping and floodplain management were paid by an annual appropriation from Congress. From 1987 to 1990, Congress required the Program to pay these expenses out of premium dollars. When expressed in current dollars, \$485 million of policyholder premiums were transferred to pay salary and other expenses of the Program. Beginning in 1991, a Federal policy fee of \$25 dollars, which was increased to \$30 in 1995, is applied to most policies in order to generate the funds for salaries, expenses, and mitigation costs.

Community Rating System

The National Flood Insurance Program's (NFIP) Community Rating System (CRS) was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP standards. The National Flood Insurance Reform Act of 1994 codified the Community Rating System in the NFIP. Under the CRS, flood insurance premium rates are adjusted to reflect the reduced flood risk resulting from community activities that meet the three goals of the CRS: (1) reduce flood losses; (2) facilitate accurate insurance rating; and (3) promote the awareness of flood insurance.

There are ten CRS classes: class 1 requires the most credit points and gives the largest premium reduction; class 10 receives no premium reduction. The CRS recognizes 18 creditable activities, organized under four categories numbered 300 through 600: Public Information, Mapping and Regulations, Flood Damage Reduction, and Flood Preparedness.

The CRS application process has been greatly simplified over the past several years based on community comments to make the CRS more user friendly as possible. Extensive technical assistance is also available for communities who request it.

Community application for the CRS is voluntary. Any community that is in full compliance with the rules and regulations of the NFIP may apply for a CRS classification better than class 10. The applicant community submits documentation that it is doing activities recognized in the CRS. A community applies by sending completed application worksheets with appropriate documentation to its FEMA Regional Office.

A community's CRS classification is assigned on the basis of a field verification of the activities described in its application. These verifications are conducted by the Insurance Services Office, Inc. (ISO), an organization that provides rating, actuarial, and forms writing services to the insurance industry. ISO is the entity that has been conducting community grading for fire insurance for many years and is now performing the grading of communities under the newly implemented Building Code Effectiveness Grading Schedule. This organization's resources provide an efficient means to carry out the field work involved with the CRS.

Disaster Mitigation Act - 2000

The Disaster Mitigation Act (DMA) of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988. The DMA authorizes the creation of a pre-disaster mitigation program to make grants to State, local and tribal governments. It also includes a provision that defines mitigation planning requirements for State, local and tribal governments. This new section (Section 322) establishes a new requirement for local and tribal mitigation plans; authorizes up to 7 percent of the HMGP funds available to a State to be used for development of State, local and tribal mitigation plans; and provides for States to receive an increased percentage of HMGP funds from 15 percent to 20 percent if, at the time of the disaster declaration, the State has in effect a FEMA approved State Mitigation Plan that meets the criteria established in regulations.

Repetitive Loss

Repetitive loss structure is a term that is usually associated with the National Flood Insurance Program (NFIP). For Flood Mitigation Assistance (FMA) program purposes, this is a structure, covered by a contract of flood insurance under the NFIP, that has suffered flood damage on two or more occasions over a 10-year period ending on the date when a second claim is made, in which the cost to repair the flood damage, on average, equals or exceeds 25% of the market-value of the structure at the time of each flood loss event. For the Community Rating System (CRS) of the NFIP, a repetitive loss property is any property, which the NFIP has paid two or more flood claims of \$1,000 or more in any, given 10-year period since 1978. A repetitive loss structure is important to the NFIP, since structures that flood frequently put a strain on the flood insurance fund.

It should also be important to a community because residents' lives are disrupted and may be threatened by the continual flooding.

A Community that prepares a mitigation plan for the FMA program is required to include a map showing the location of all repetitive loss structures and address ways to reduce or eliminate the damages. The community should also identify whether the structures are residential, commercial or industrial uses, since mitigation actions are frequently dependent on the use of the structure. Information regarding whether a community has any repetitive loss structures may be obtained from the State NFIP Coordinator's Office or the FEMA Regional Office.

Common sources of funding which can be used to mitigate repetitive loss structures are FMA funds and Hazard Mitigation Grant Program (HMGP) funds. Increased Cost of Compliance (ICC) funds for substantially damaged structure covered by flood insurance can also be used to mitigate repetitive loss structures.

Since actual losses are not limited to those structures that are in the NFIP or those that are at risk to only flood damage, communities are encouraged to identify any structure that is susceptible to the hazards included in the plan and may have been repeatedly damaged. This helps to ensure that the community becomes disaster resistant. Communities may determine the location of repetitive loss structures by reviewing the records of their local emergency responders, by relying on visual records after a disaster, or by surveys of the community.

Some communities have been concerned with including information on repetitive loss structures in the mitigation plan because of "Privacy Act" issues. As long as the plan only includes the address of each structure, a note that the particular address is a repetitive loss structure, and an accompany map showing the location of the hazard and the structure, this should not be an issue.

2.5.2 State Regulation

State Floodplain Management Role

New York State also has a role in the NFIP. Each State has designated an NFIP State Coordinating Agency as a point of contact for the NFIP, and in New York, that agency is the Department of Environmental Conservation (DEC).

The Department's Flood Protection Bureau and its Regional Floodplain Management Coordinators act as the liaison between FEMA and local municipalities. Also, Article 36 of the Environmental Conservation Law directs the Department to give municipalities any necessary technical assistance to qualify them for entrance into the NFIP. Following is a list of DEC activities related to the Program:

- explain NFIP requirements for Program eligibility to local officials;
- assist in the preparation of local floodplain management regulations;

- provide model regulations;
- if requested by the community, attend local hearings on regulations to assist in answering questions regarding the NFIP;
- assist local officials in understanding flood insurance studies and maps;
- assist the local administrator in permit review;
- be the repository of data and calculation used in the preparation of flood insurance studies; and
- monitor community compliance with the NFIP.

A community may request assistance in any of these areas by contacting the appropriate DEC Regional Office or the Flood Protection Bureau in Albany.

Article 36, Environmental Conservation Law (ECL)

Article 36, ECL, is the basis for the Department's action in relation to the National Flood Insurance Program. The federal Flood Disaster Protection Act of 1973, among other provisions, requires the purchase of flood insurance in connection with receiving any form of federal financial assistance for acquisition or construction purposes in identified special flood hazard areas. The State Legislature recognized that if a flood-prone community did not join the NFIP or did not maintain its eligibility, federal grants or mortgages for purchasing or repairing structures in the special flood hazard area would be denied. Therefore, the Legislature directed that: (1) the DEC provide technical assistance to local governments in the preparation of programs necessary to qualify for the NFIP; (2) in the event that a local government fails to take the steps necessary to join the NFIP, drops out or is suspended from the Program, the DEC has the authority to invoke floodplain management regulations and to enroll the community; and (3) State agencies take actions that minimize flood hazards and losses in connection with state-owned facilities and programs.

As a result of this mandate, the DEC promulgated two sets of regulation that spell out how these actions are to be accomplished. They can be found in Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York, under Part 500 and Part 502.

Part 500 - State Regulation in Communities

The Department of Environmental Conservation, under the authority of Article 36, ECL, may institute a floodplain development permit program in a community that fails to qualify for the National Flood Insurance Program on its own. When a community is first notified by FEMA that it has special flood hazard areas, it has one year from the notification date to qualify for the NFIP before sanctions are applied. Also, when a community moves from the Emergency Phase to the Regular Phase of the Program, it usually has to add new provisions to its local floodplain management law. It has six months after notice from FEMA to do this. IF the community does not take the steps necessary to qualify by three months before the deadline, the DEC may then institute Part 500 regulations and enroll the community in the NFIP. The DEC may also institute

Part 500 regulations in any community that withdraws from the NFIP or has its eligibility suspended.

To implement Part 500 regulations in a community, the DEC must publish, in a newspaper having general circulation in that community, a notice containing the following: (1) a statement that the community may not be or is not qualified for eligibility in the NFIP; (2) a statement that the DEC will administer the Part 500 regulations if the community does not qualify; (3) a statement that the Part 500 regulation will take precedence over less restrictive local laws, ordinances, regulation or codes; and (4) the date, time and location of a public meeting to be held in or near the community within ten days of publication of the notice at which interested parties may appear for information purposes. The regulations become effective in the community on the date specified in the Commissioner's "Order of Applicability". The DEC submits to FEMA, on behalf of the community, an application for eligibility. When FEMA notifies the Department that the community is eligible, a notice of such is published in the local newspaper. The regulations apply only in special flood hazard areas in the community as shown on the Flood Hazard Boundary Map or Flood Insurance Rate Map.

When a community is under Part 500 regulations, no one may undertake any project in a special flood hazard area without applying and receiving a permit from a DEC Regional Office. "Project" has a broad definition here and includes: construction of a new structure; installation of any sewer, gas or water main or electrical transmission line or other service line or facility; the improvement, alteration, repair, reconstruction or restoration of an existing structure including but not limited to the cutting, modification, relocation, rearrangement or removal of any wall, flood, roof, beam, support or part thereof that would affect the loading structural integrity or flood resistance of such structure; the emplacement of pilings or a foundation or the affixing of a manufactured home (mobile home) to a permanent site. It also includes the following: paving, mining, drilling, dredging, clearing, grading, filling or depositing; excavation for basement footings, piers or a foundation; the erection of temporary forms; installation of pilings under proposed sub-surface footings and the subdivision of land. It does not include usual farming and gardening activities.

A community under Part 500 regulations may assume local administration of the NFIP from DEC. For instructions on the requirements contact DEC Flood Protection Bureau in Albany.

Part 502 - State Agency Compliance

Under Article 36 of the Environmental Conservation Law, State agencies are directed to minimize flood hazards and losses in connection with State-owned and State financed buildings, roads and other facilities. The Part 502 regulations contain the criteria that State agencies must meet. These criteria meet or exceed the floodplain management criteria of the National Flood Insurance Program and ensure that State projects will not negatively impact a community's special flood hazard areas. Contact the DEC Flood

Protection Bureau in Albany or a DEC Regional Floodplain Coordinator for more information about these regulations.

2.5.3 Local Land Use Regulation and Control in the Flood Zone

Countywide

Generally, Genesee County municipalities have adequate land use regulations. All of the participating municipalities have zoning ordinances, although some would benefit from updating.

There are 13,570.6 acres of mapped flood zone in the Tonawanda and Oatka Creek watersheds in Genesee County. The flood zone is can also be called the 'flood plain' or 'flood prone areas' and is defined and mapped by the Federal Emergency Management Administration (FEMA) as land that has a 1% chance of being flooded in any given year. This land is generally low lying land near creeks or other water bodies.

Of the 13,570.6 acres in Genesee County, nearly 88% is in agricultural, low density residential, or open space zones. Only 12.1% is in commercial, industrial, or higher density residential zones.

(Note: Figures for Towns exclude any villages contained within)

Town of Alabama

The Town of Alabama has 304.6 acres of flood zone in the Tonawanda Creek watershed. Virtually all of this has been zoned for open space, which is by far the most appropriate zoning for flood prone areas.

(Note: The Town of Alabama figures exclude the Tonawanda Reservation)

Town of Alexander

The Town of Alexander has 3,712.7 acres of flood zone in the Tonawanda Creek watershed with virtually all of it having an agricultural or low density residential designation. As Alexander experiences more rural residential and agricultural development, it is important to enforce appropriate building codes for anyone wishing to build in a flood prone area.

Village of Alexander

The Village of Alexander has 64.7 acres of flood zone in the Tonawanda Creek watershed. A significant portion of this, 47.8 acres or nearly 74% has an industrial designation, with an additional 6.9% zoned for higher density residential. While this is partially explained by Alexander's historic village center being very close to the creek, it is crucial for the village to re-examine its zoning to ensure that industrial development is

kept out of flood prone areas. There may be additional lands outside the flood plain more appropriate for industrial zoning while flood plain lands might be re-zoned to open space or lower density residential.

Village of Attica

The Village of Attica straddles the Wyoming-Genesee County line, with the bulk of the village's land area, and its historic business district, in Wyoming County. However, the Genesee County portion contains the newer, auto-oriented, commercial area that has developed in the past 30-40 years. The Genesee County portion of the village contains 25.9 acres of flood zone in the Tonawanda Creek watershed. All of this land is designated as commercial. While it may be argued there is a need to reinforce existing development and infrastructure through zoning, this area needs to be re-examined, since it is frequently flooded and especially since this is where the two deaths occurred in the 1998 flood. Re-zoning to open space should be actively pursued, as should measures to protect, elevate, or even purchase and relocate any buildings that exist in this flood prone area. The Village of Attica should work with the Town of Alexander to ensure appropriate amounts and types of zoning in this commercial corridor area.

City of Batavia

The City of Batavia has 688.7 acres of flood zone in the Tonawanda Creek watershed. It is the largest community and only city in the Joint Flood Plan study area. It is also historic, with settlement dating back to 1802. Fully 50% of the 688.7 acres is designated as low density residential and open space. Reflecting the more developed nature of the city though, the other 50% is designated commercial, industrial, or special incentive zoning. While recognizing the difficulty of finding land for larger scale commercial and industrial development in an older community, as well as the importance of encouraging investment to reinforce the historic city core, there may be other areas more appropriate for commercial and industrial zoning. The city should review its zoning in flood prone areas and be exceedingly vigilant in enforcing design standards and building codes for structures in these areas.

Town of Batavia

The Town of Batavia has 4020.1 acres of flood zone in the Tonawanda Creek watershed, the most of any municipality in the study. While a significant portion, 77%, has an agricultural designation, 23% has an industrial, commercial or higher density residential designation, which is a very high percentage compared to the other rural towns in the study area. It is high compared even to other towns that surround more developed areas, such as Warsaw and LeRoy.

It is crucial for the town to re-examine its zoning to ensure that industrial and commercial development is kept out of flood prone areas. As Batavia is still largely rural, there are additional lands outside the flood plain more appropriate for industrial or commercial zoning while flood plain lands might be re-zoned to open space or lower

density residential. This is especially critical in that the Town of Batavia faces higher than average development pressures in the Route 5 corridor west of the city and this area also has greater potential for flooding problems. It is very important that the town be aware of, understand, and vigorously enforce appropriate building codes for anyone wishing to build in a flood prone area.

Town of Bethany

The Town of Bethany has 874.9 acres of flood zone in both the Tonawanda Creek and Oatka Creek watersheds. All of the land in the flood zone has an agricultural/low density residential designation. As Bethany experiences more rural residential and agricultural development, it is important to enforce appropriate building codes for anyone wishing to build in a flood prone area.

Town of Darien

The Town of Darien has a small amount, 49.4 acres, of flood zone in the Tonawanda Creek watershed. All of the land in the flood zone has a low density residential designation. As Darien experiences more rural residential development, it is important to enforce appropriate building codes for anyone wishing to build in a flood prone area.

Town of LeRoy

The Town of LeRoy has 1,198.9 acres of flood zone in the Oatka Creek watershed. 86.7% has an agricultural or low density residential designation. However, 12.5% or 150.8 acres has a commercial or industrial land use designation. This is a relatively high percentage of flood prone land designated for more intensive development. It is recommended that the town be extremely vigilant in enforcing flood plain ordinances on any commercial or industrial development that does occur and review its zoning in flood zones and possibly re-zone to agriculture, low-density residential, or open space.

Village of LeRoy

The Village of LeRoy has 129.1 acres of flood zone in the Oatka Creek watershed. Fully 50% of this land is designated as open space, which is the highest percentage for any of the more intensely developed municipalities in the study area. Only 15 acres, or 11.7% has a commercial or industrial designation, which is commendable given LeRoy's historic center being located on Oatka Creek. The village should ensure that flood plain ordinances are enforced on any development in flood prone areas and that new development or land use regulations enhance the amenity of Oatka Creek.

Town of Pavilion

The Town of Pavilion has 764.8 acres of flood zone in the Oatka Creek watershed with much of it, 96.8%, having an agricultural or low density residential designation. Only 24.6 acres or 3.2% has an industrial designation. The town may want to re-examine

zoning in this small area. As Pavilion experiences more rural development, as well as development in the hamlet area, it is important to enforce appropriate building codes for anyone wishing to build in a flood prone area.

Town of Pembroke

The Town of Pembroke has 856.5 acres of flood zone in the Tonawanda Creek watershed with much of it, 88.2%, having an agricultural or low density residential designation. However, there is an area of 86.1 acres that has a higher density residential designation. The town may want to re-examine this zoning to ensure that higher density residential development does not occur in flood prone areas. As Pembroke experiences more rural development, as well as development in the Thruway interchange area, it is important to enforce appropriate building codes for anyone wishing to build in a flood prone area.

Town of Stafford

The Town of Stafford has 91.8 acres of flood zone in both the Tonawanda Creek and Oatka Creek watersheds; however the Town was never completely mapped by FEMA, so the actual flood prone land is probably greater. All of the land in the current flood zone has an agricultural/low density residential designation. As Stafford experiences more rural development, it is important to enforce appropriate building codes for anyone wishing to build in a flood prone area. An additional recommendation is to fully map the town.

Tonawanda Reservation

The Tonawanda Reservation has 788.7 acres of flood zone in the Tonawanda Creek watershed. The Reservation is unique in that it does not have zoning, building codes, or formal land use controls. However, few flooding problems are reported and have no houses or other structures impacted by flooding. There is an understanding amongst the Tonawandas that the creek side lands are for communal use for hunting and fishing. So, in effect, the flood plain in the Reservation is zoned for recreation and open space.

Table 2.3 - Land Use Regulation and Control in Genesee County

Municipality (Mun)	Mapped Flood Zone in Mun (in acres)*	Ag/Residential		Agricultural		Commercial/business		Commercial/industrial (mixed)		Higher Density Residential		Industrial		Lower Density Residential		No Zoning		Open space		Special Incentive Zone	
		Amt (acres)	% of Flood Zone	Amt (acres)	% of Flood Zone	Amt (acres)	% of Flood Zone	Amt (acres)	% of Flood Zone	Amt (acres)	% of Flood Zone	Amt (acres)	% of Flood Zone	Amt (acres)	% of Flood Zone	Amt (acres)	% of Flood Zone	Amt (acres)	% of Flood Zone	Amt (acres)	% of Flood Zone
Alabama T**	304.570	1.590	0.5%															304.570	100.0%		
Alexander T	3712.650	3681.700	99.2%					11.180	0.3%	0.560	0.0%	1.440	0.0%	17.770	0.5%						
Alexander V	64.730	2.560	4.0%			1.410	2.2%			4.450	6.9%	47.810	73.9%					8.500	13.1%		
Attica V***	25.900					25.900	100.0%														
Batavia C	688.660	1.490	0.2%			68.850	10.0%					241.050	35.0%	317.830	46.2%			39.900	5.8%	19.540	2.8%
Batavia T	4020.050	3114.590	77.5%			254.930	6.3%			2.370	0.1%	646.590	16.1%	1.570	0.0%						
Bethany T	874.870	874.870	100.0%																		
Darien T	49.400													49.400	100.0%						
Leroy T	1198.850	853.040	71.2%			40.000	3.3%			9.720	0.8%	110.750	9.2%	185.330	15.5%						
Leroy V	129.090					1.230	1.0%			0.110	0.1%	13.800	10.7%	48.730	37.7%			65.210	50.5%		
Pavilion T	764.820	654.510	85.6%									24.550	3.2%	85.760	11.2%						
Pembroke T	856.490	289.450	33.8%	465.660	54.4%	15.290	1.8%			86.090	10.1%										
Stafford T****	91.790	91.790	100.0%																		
Tonawanda Res.	788.690															788.690	100.0%				
County Total	13570.560	9565.590	70.5%	44.097	0.3%	407.610	3.0%	1.059	0.0%	103.300	0.8%	1085.990	8.0%	706.390	5.2%	74.686	0.6%	418.180	3.1%	1.851	0.0%

* Flood zones in Tonawanda or Oatka watersheds only; town figures exclude any villages contained within; amounts less than one one-hundredth of an acre were not included

** Does not include the Tonawanda Reservation

*** Genesee County portion only

**** Town of Stafford is not completely mapped

2.6 - National Flood Insurance Program (NFIP) Participation

In order to gain the full benefit of the NFIP, local officials must be aware of key aspects of the program. **Table 2.4** shows some questions and/or inconsistencies that came up during the municipal interview process.

First, in order to participate in the NFIP, a municipality **MUST** have a Flood Prevention Ordinance (FPO). A model ordinance was prepared several years ago by the DEC and this is essentially what most communities have adopted as part of their zoning regulations or local laws. However, some municipalities in the study area are unaware that such an ordinance is on the books in their municipality.

Second, some municipalities are not aware that they participate in the NFIP. In reality, all participate in Genesee County. Although some local officials are unsure of their participation status, or the program in general, the local participation status has been cross-checked on the Federal Insurance Administration's Community Status List (**see Table 2.5**), available from FEMA.

Third, every community that participates in the NFIP has a Flood Plain Administrator identified in their local FPO. In some cases it is the Town Board, but in most cases it is the Zoning Enforcement Officer or Building Inspector. Whether or not the person is trained depends on whether or not they attended training sessions provided by NYSDEC. The FPO issues floodplain development permits for activities in the floodplain.

The Tonawanda Reservation appears to have a floodplain mapped, but they are not listed on the Community Status List. The Seneca Nation of Indians in Erie, Cattaraugus, Chautauqua, and Allegany Counties are listed, so it is not an issue of Indian Reservations being left off the list. NYSDEC Region 9 has worked on flooding

issues with the Seneca Nation of Indians. They are concerned about the status of the Tonawanda Senecas in relation to the list.

Finally, it should be noted that although some municipalities are unaware of their NFIP status and other issues surrounding this program, in some cases it is simply a case of not asking the right municipal official. However, it still needs to be stressed that there are some towns where the responsible official is unaware of the program and the local ordinances that back it up. This issue needs attention at the local level.

Table 2.4 - National Flood Insurance Program Participation in the Oatka and Tonawanda Creek Watersheds

Municipality	Participate in NFIP?	NFIP Community #	FIRM Date	Rebuilding Policy?	Trained Floodplain Administrator?	Notes/Questions/Inconsistencies
Alabama T	Yes	361067C	11/18/1983*	No	No	town was not sure if it participated
Alexander T	Yes	360277	5/4/87	No	No	town indicated that it did not have a FPO
Alexander V	Yes	361496	5/4/87	No	No	village indicated that it did not have a FPO
Attica T	Yes	360940	4/30/86	No	No	
Attica V	Yes	360985	7/3/86	No	Yes	
Batavia C	Yes	360279	9/16/82	Yes	Yes	
Batavia T	Yes	360278	1/17/85	Yes	No **	town was not sure if it participated
Bennington T	Yes	360941C	12/23/1983*	No	Yes	
Bethany T	Yes	361138	9/24/1984*	Yes	Yes	
Covington T	Yes	360942B	12/23/1983*	No	No	town indicated that it did not participate in NFIP and had no FPO
Darien T	Yes	361140A	7/6/1984*	No	No	town indicated that it did not participate in NFIP and did not think it had a FPO
Gainesville T	Yes	360944B	12/23/1983*	No	No	
Leroy T	Yes	360280	9/14/1979*	Yes**	Yes	
Leroy V	Yes	360281	8/3/81	Yes**	Yes	
Middlebury T	No		No	No	No	
Orangeville T	Yes	360945	12/23/1983*	No	No	town did not think it participated and indicated that it did not have a FPO
Pavilion T	Yes	360282B	2/27/1984*	No	Yes **	town indicated that it did not participate in NFIP
Pembroke T	Yes	360283	1/20/1984*	No	No	town indicated that it did not have a FPO
Sheldon T	Yes	360949B	12/23/1983*	No	No	town indicated that it did not have a FPO
Stafford T	Yes	361118A	7/16/82			
Tonawanda Reservation	No		?***	N/A	No	
Warsaw T	Yes	360950B	12/23/1983*	No**	Yes	
Warsaw V	Yes	360951	11/18/81	No**	Yes	
Wyoming V	Yes	360952	8/3/81	No	No	village indicated that it did not participate in NFIP and had no FPO

* Characterized by FEMA as minimally flood-prone, therefore no elevation on FIRM

** unsure

***The Reservation has mapped floodplains, but source of floodplain mapping unclear

Table 2.5 NFIP Information - Genesee County

Communities	# of Policies	# of Claims	Insurance in Force	Total Losses Paid since 1978
Alabama, Town of	2	1	\$97,000	\$0
Alexander, Town of	7	8	\$620,900	\$79,510
Alexander, Village of	6	6	\$311,900	\$65,593
Batavia, City of	369	32	\$23,805,400	\$40,266
Batavia, Town of	39	11	\$2,317,800	\$26,848
Bethany, Town of	3	0	\$263,300	\$0
Darien, Town of	2	0	\$201,000	\$0
LeRoy, Town of	10	3	\$1,026,700	\$14,843
LeRoy, Village of	6	2	\$330,600	\$4,879
Pavilion, Town of	4	1	\$213,800	\$16
Pembroke, Town of	6	0	\$323,700	0
Stafford, Town of	2	1	\$121,000	\$0
Tonawanda Reservation	N/A	N/A	N/A	N/A

Source: Federal Emergency Management Agency

3 – Planning Process

This plan is a result of the commitment of the participating municipalities and the efforts of the Joint Flood Mitigation Planning Committee, along with federal, state, regional, county, and municipal input. Each participating municipality adopted a supporting resolution at the beginning of the planning process (see Appendix A). The Planning Committee was comprised of representatives from public agencies and municipalities (see Appendix B).

Coordination between a number of agencies at the local, county, regional, state, and federal levels along with private interests was initiated to insure that the issues affecting both residents and businesses in Genesee County would be included in the development of the flood mitigation action plan.

This chapter describes the work done cooperatively by multiple agencies at the meetings, activities done to insure public awareness and participation, and the process by which the plan was reviewed and amended.

3.1 - Flood Mitigation Planning Committee

The Planning Committee met monthly on the fourth Tuesday, beginning in November 2002. The minutes of the Planning Committee meetings can be found in Appendix B. The following is a brief summary of the monthly meetings:

November 25, 2002 - The Committee held its initial meeting to discuss the overall purpose of the plan (including preliminary goals and objectives) and begin developing a process to involve the public, municipalities and identify flood hazard areas.

It was decided that each municipality would get a letter of invitation that would identify participating municipalities, identify a key contact person at each municipality, identify potential municipal representatives to Planning Committee, and identify other key people in each municipality.

January 28, 2003 - The Committee reviewed project progress, the property owner survey, the floodway delineation, list of critical facilities, list of county and municipal contacts, and public outreach. A draft list of questions and contacts for municipalities was distributed for comment. Information and data gathering sessions with key county agencies was discussed.

February 25, 2003 - The Committee reviewed project progress, municipal contacts, and the process for the first series of public meetings. The use of the Genesee County web site as the project web site was announced. The coordination with the Oatka Creek Watershed Committee for public meetings was discussed.

March 25, 2003 - The Committee reviewed project progress, municipal contacts and resolutions, public meeting logistics, and the draft prioritization criteria for site hazard

evaluation. Completed interviews with state and county agencies and municipalities was discussed. The process for historical flood analysis was discussed.

April 22, 2003 - The Committee reviewed project progress, the outcome of the public meetings, risk assessment issues, the final prioritization criteria for site hazard evaluation, initial survey outcomes, and draft flood mitigation plan goals and objectives.

May 27, 2003 - The Committee reviewed project progress, initial survey analysis, the dam inventory, and the list of prioritized sites for site hazard evaluation.

June 24, 2003 - The Committee reviewed project progress, draft sections of the report, and discussed potential flood mitigation action steps.

July 22, 2003 - The Committee reviewed the draft report.

August 26, 2003 – The Committee developed an outline for the Executive Summary, considered final Mitigation Plan distribution, and considered the county and municipal Mitigation Plan adoption process.

3.2 – Coordination among Relevant Agencies and Municipalities

In order to coordinate the activities of the Joint Flood Mitigation Project and to get a better understanding of the flooding issues in Genesee and Wyoming Counties interviews were set up with all associated federal, state, and county agencies as well as informed members of each participating municipality.

The following is a list of state and federal agency interviews that assisted in coordinating activities and identifying issues and potential solutions related to the project:

State

1. Agency: NYS Department of Environmental Conservation, Permitting
Date: June 9, 2003
Person(s) Interviewed: Robert Shearer (Region 8), Steve Deleski (Region 9)
2. Agency: NYS Department of Environmental Conservation, Flood
Date: March 4, 2003
Person(s) Interviewed: Paul Schmied (Region 8), Rebecca Anderson (Region 9)

Federal

1. Agency: Army Corps' of Engineers
Date: May 15, 2003
Person Interviewed: Richard K. Theobald

The following county agencies were permanent members of the Planning Committee: Emergency Management Office, Soil & Water Conservation, and Planning. Additionally, the following is a list of county agency interviews that assisted in coordinating activities and identifying issues and potential solutions related to the project:

Genesee County

1. Agency: Genesee County Soil & Water Conservation District
Date: January, 17, 2003
Person(s) Interviewed: George Squires (Manager)
2. Agency: Genesee County Emergency Management Office
Date: January 17, 2003
Person(s) Interviewed: Roger Lander (Director)
3. Agency: Genesee County Planning
Date: January 17, 2003
Person(s) Interviewed: James Duval (Director), Felipe Oltremari (Senior Planner)
4. Agency: Genesee County Highway Department
Date: February 25, 2003
Person(s) Interviewed: Tim Hens (Highway Superintendent)
5. Agency: Genesee County Historian
Date: February 25, 2003
Person(s) Interviewed: Sue Conklin (County Historian/Records Management Officer)
6. Agency: Genesee County Health Department
Date: March 4, 2003
Person(s) Interviewed: Christopher Szwagiel (Director)

All participating municipalities in the Tonawanda and Oatka Creek Watershed in Genesee County have at least one representative on the Planning Committee. Additionally, the following meetings were set up with all of the participating municipalities in Genesee County to gain a better understanding of flooding issues using a standard interview methodology ([see Appendix C](#)):

1. Municipality: Town of Alabama
Date and Time: May 30, 2003, 1:45 PM
Persons Interviewed: Tony Michalek (Highway Superintendent)
2. Municipality: Town of Alexander
Date and Time: March 10, 2003, 9:00 AM

Persons Interviewed:	Bill Hirsch (Councilmember, Fire Dept. rep.), Dan Kelsey (Supervisor), David Lange (NYSDOT Resident Engineer), Thomas Lowe (Highway Superintendent)
3. Municipality:	Village of Alexander
Date and Time:	March 10, 2003, 9:00 AM
Persons Interviewed:	Vera Antonucci (Clerk), David Lange (NYSDOT Resident Engineer), Ralph Robbins (DPW Superintendent), Richard Scharlau (Mayor)
4. Municipality:	Village of Attica
Date and Time:	March 5, 2003, 9:00 AM
Persons Interviewed:	Brian Krawczyk (Chief Operator, Water Treatment Plant), Doug Post (Village Administrator), Mike Smart (Highway Superintendent)
5. Municipality:	City of Batavia
Date and Time:	February 18, 2003, 9:30 AM
Persons Interviewed:	Lisa Paganin (Asst. City Engineer), Larry Smith (Fire Chief), Michael Smith (CEO/Building Inspector/ZEO), Len Walker (Public Works Director)
6. Municipality:	Town of Batavia
Date and Time:	March 11, 2003, 9:30 AM
Persons Interviewed:	Mike Cleveland (Assessor), Rod Cook (Highway Superintendent), Clint Worthington (CEO/ZEO), Tim Yaeger (Fire Chief)
7. Municipality:	Town of Bethany
Date and Time:	March 26, 2003, 9:00 AM
Persons Interviewed:	Tom Douglas (CEO/ZEO), Joyce Fleming (Deputy Supervisor), Lou Gayton (former Highway Superintendent), Bill Gick (Councilmember)
8. Municipality:	Town of Darien
Date and Time:	March 26, 2003, 7:00 PM
Persons Interviewed:	Teresa Burkhardt (Clerk), Kim Drew (Supervisor), Stephen Ferry, Sr. (Councilmember), Henry Hooper (Councilmember), Joanna Johnson (Councilmember), Neil Marzolf (Highway Superintendent)
9. Municipality:	Town of LeRoy
Date and Time:	April 3, 2003, 3:00 PM
Persons Interviewed:	Bruno DeFazio (Councilmember), Jerry Roth (Highway Superintendent), Gene Sinclair (CEO/ZEO), Rochelle Stein (Supervisor)

10. Municipality:	Village of LeRoy
Date and Time:	April 3, 2003, 3:00 PM
Persons Interviewed:	Gene Sinclair (CEO/ZEO) Follow-up: Kermit Arrington (former DPW Superintendent), Sharon Jeary (Clerk)
11. Municipality:	Town of Pavilion
Date and Time:	March 26, 2003, 11:00 AM
Persons Interviewed:	Terry Bartholomew (land owner), Neil Kingdon (Supervisor), Tom Klapper (Planning Board rep.), Lynne Roblee (Clerk), Alan Rudgers (CEO/ZEO), Jim Starr (land owner), John Strathearn (Highway Superintendent)
12. Municipality:	Town of Pembroke
Date and Time:	March 27, 2003, 9:00 AM
Persons Interviewed:	Ed Beideck (Supervisor), Jim Duschen (Highway Superintendent), Jim Mallory (Councilmember)
13. Municipality:	Town of Stafford
Date and Time:	May 15, 2003, 2:00 PM (approximately)
Persons Interviewed:	Robert Donnelly (Highway Superintendent)
14. Municipality:	Tonawanda Reservation
Date and Time:	March 27, 2003, 3:00 PM
Persons Interviewed:	Chris Abrams (Clerk), Mardell Sundown (Environmental Technician)

3.3 – Public Involvement and Outreach

There were two series of public meetings for the project. The first series of public meetings were held on the following dates and locations:

- March 27, 2003, 7:00-9:00pm, Warsaw, New York
- April 1, 2003, 7:00-9:00pm, Pavilion, New York
- April 3, 2003, 7:00-9:00pm, LeRoy, New York
- April 8, 2003, 7:00-9:00pm, Alexander, New York

The meetings were organized to provide information, benefits of flood mitigation planning, provide findings of the initial hazard assessment, and to provide a forum for input into the plan. The information portion of the meeting included definitions of watersheds, flooding, floodplains, floodzones and base flood elevation, and floodplain management and a discussion of funding, the National Flood Insurance Program (NFIP), the Community Rating System (CRS), intermunicipal cooperation, damage reduction and safety, erosion and sediment control, critical facilities, and flooding risks.

The issues raised at the meetings included debris clearing and habitat disruption, streambank erosion and restoration, siltation, culvert maintenance and sizing, dams, education and awareness, flooding in the tributaries, development and increased impervious surfaces, creek straightening, increased flooding in recent years, buffer zones and the roles of the ACE (see [Appendix D](#) for a full list of issues raised).

The second series of public meetings were held on the following dates and locations:

- August 19, 2003, 7:00-9:00pm, Attica High School, Attica
- August 21, 2003, 7:00-9:00pm, Pavilion Town Hall, Pavilion

These meetings were held to update the public on the progress of the Joint Flood Mitigation Plan and raise awareness of the planning process and flooding in general. Representatives from the two counties, Genesee/Finger Lakes Regional Planning Council, and Lu Engineers were there to present the findings of the report and answer public questions.

The meetings were publicized in the Batavia Daily News, the Warsaw Country Courier, and the Rochester Democrat and Chronicle. Approximately 25 people attended between the two meetings.

3.4 – Review, Revision, and Adoption of the Plan

4 – Flood Hazards/Risk Assessment

Areas prone to frequent flooding exist throughout **Genesee County**. Flood hazards include problems caused by flooding to existing development and potential problems that will occur if development in specified flood prone areas is permitted. These hazards pose threats to safety and property regardless of whether or not there is development present on the land.

A number of sources were used to identify and determine the type and severity of flooding throughout the **Tonawanda and Oatka Creek Watersheds**. Initially, the Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) provided by the ACE through FEMA were utilized to gain a basic delineation of the flood hazard areas.

However, the FIRM and FIS were based on hydraulic analyses that assumed there would be unobstructed flow of floodwaters through the channels of the creeks and their tributaries. Any development or encroachment in the floodplain will increase the height of floodwaters and the possibility of damage to even more properties than those shown on the FIRM.

For this reason, other methods were used to identify flood hazard areas not currently identified on the FIRM or FIS. These methods included:

- A parcel survey developed by the Planning Committee (see **Section 4.8**);
- information from local, county and state agencies gathered at Planning Committee meetings and interviews (see Chapter 3);
- residents' input at the public information forums;
- aerial photographs of priority sites provided by the **Genesee County** SWCD;
- site visits; and
- previous studies and reports.

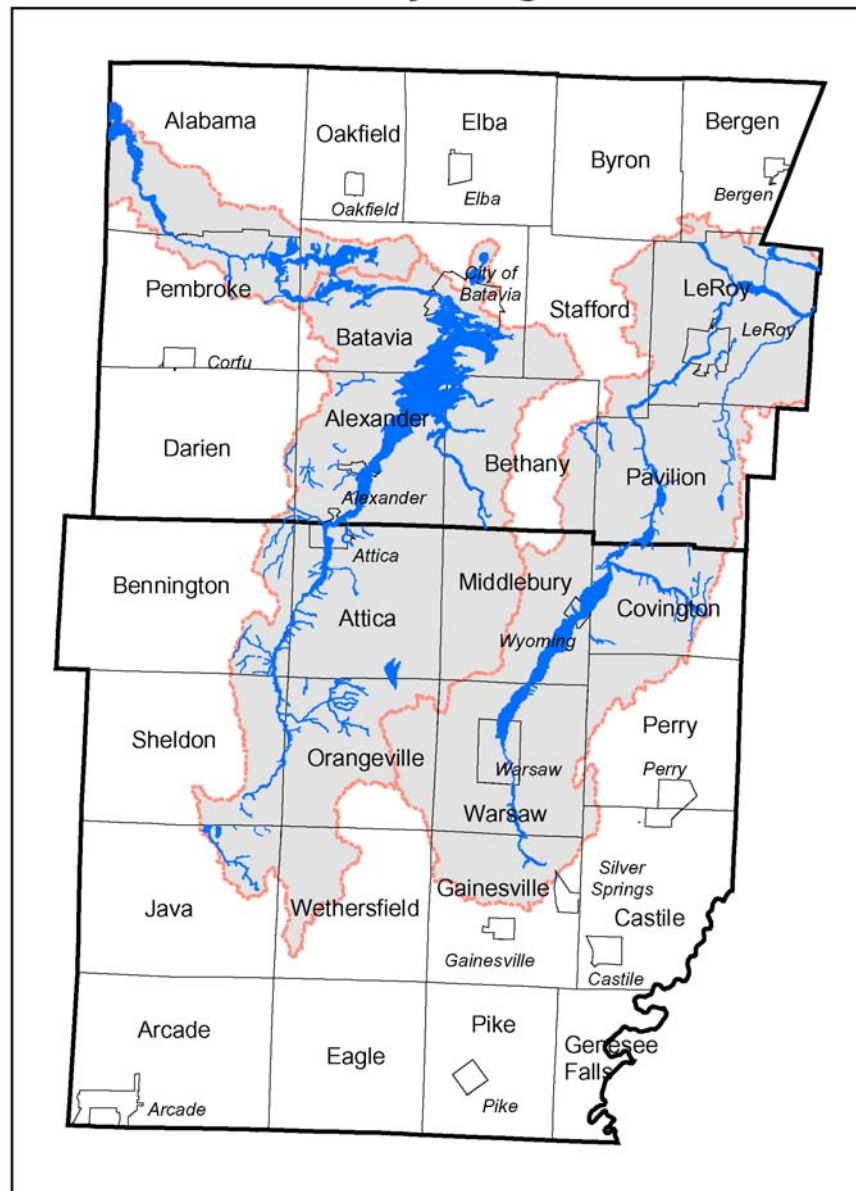
4.1 - FIRM Determined Base Flood Elevation

The most widely distributed flood map product is the Flood Insurance Rate Map (FIRM). Flood risk information presented on FIRMs is based on historic, meteorologic, hydrologic, and hydraulic data, as well as open-space conditions, flood control works, and development. To prepare FIRMs that illustrate the extent of flood hazard in a flood prone community, FEMA conducts engineering studies referred to as Flood Insurance Studies (FISs). Using information gathered in these studies, FEMA engineers and cartographers delineate Special Flood Hazard Areas (SFHAs) on FIRMs. SFHAs are those areas subject to inundation by a flood that has a 1-percent or greater chance of being equaled or exceeded during any given year. This type of flood is referred to as a base flood. A base flood has a 26-percent chance of occurring during a 30-year period, the length of many mortgages. The base flood is a regulatory standard used by Federal agencies, and most states, to administer floodplain management programs, and is also used by the NFIP as the basis for insurance requirements nationwide.

All municipalities in Genesee County along the Tonawanda and Oatka Creek have FIRMs (see [Map 4.1](#)). It is important to note that FIRM map extent of flooding assumes no stream channel obstructions. This is not the case with Oatka or Tonawanda Creek channels.

Map 4.1

Flood Zones Genesee & Wyoming Counties



Data Sources:
Flood Zones - FEMA
Watersheds - NRCS
Municipal Boundaries - NYS DOT

0 5 10 15 Miles

Prepared by Genesee/Finger Lakes Regional Planning Council



■ Flood Zone
■ Watersheds
 Municipalities

4.2 – Additional Flooded Areas

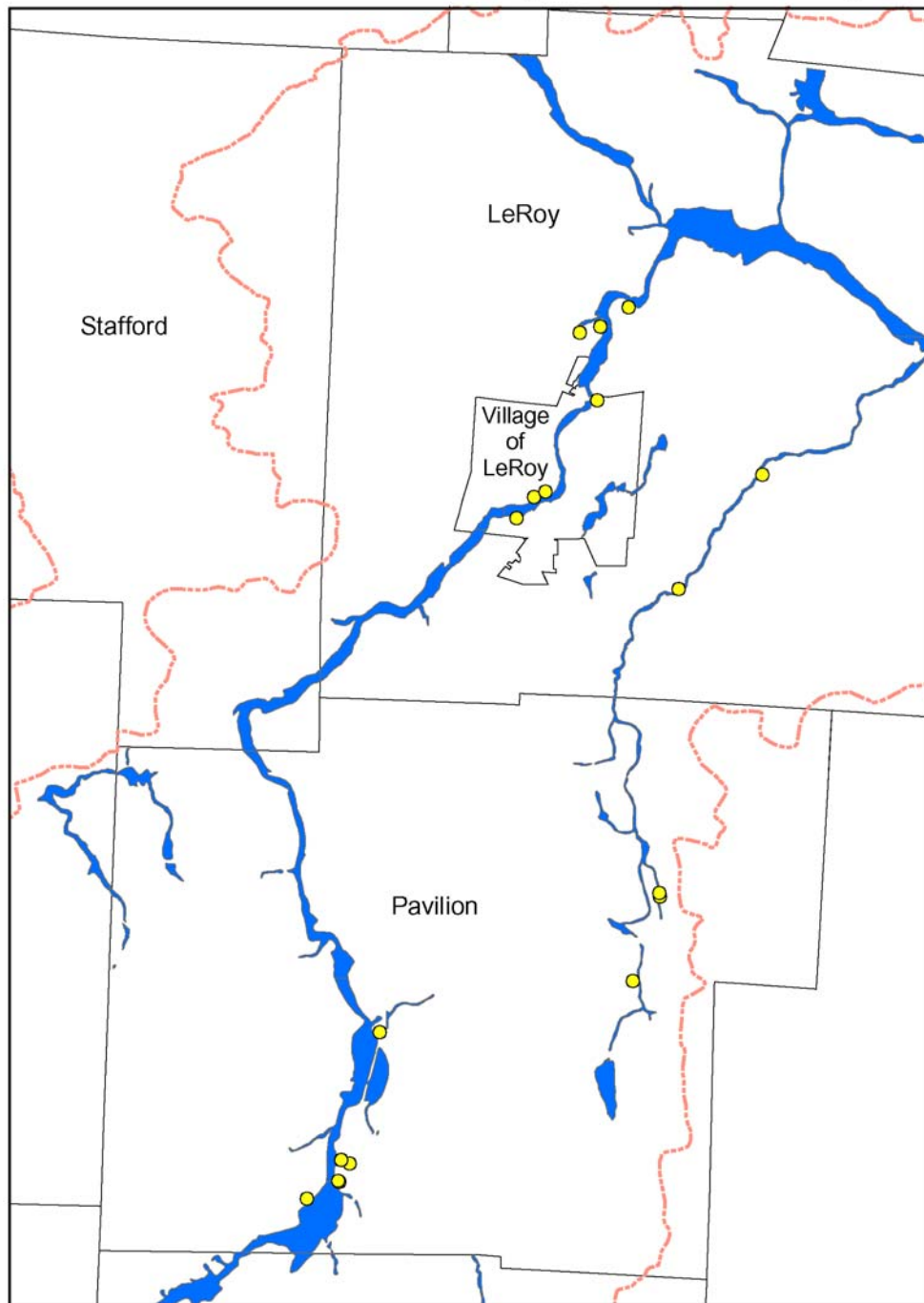
The flood hazard areas described below in **Table 4.1 and Maps 4.1**, were determined based on the residential, agricultural and commercial/industrial surveys (see **Section 4.8**) and discussions of the Planning Committee and interviews held with federal, state and county agencies and municipal representatives (see Chapter 3).

The purpose of investigating areas outside the FIRM designated floodplain is to gain a better understanding of areas at risk due to riverine flooding, overland flooding/stormwater runoff, and ponding.

Table 4.1 - Additional Flooded Areas					
	Total	In Flood Zone	Damage	Out of Flood Zone	Damage
Genesee County	179	118		61	
City of Batavia	71	57	B,1,P	14	B,1,P
Alabama	0	0		0	
Alexander	15	6	B	9	B,P
Batavia	33	26	B,P,S	7	B
Bethany	8	6	B,1,P	2	P,S
Darien	1	0		1	P
LeRoy	11	6	B,P	5	P,B
Pavilion	14	5	B,C,P	9	B
Pembroke	11	7	P	4	P
Stafford	1	1	B	0	
V. of Alexander	9	3	B,C,P	6	B,1
V. of Attica	0	0		0	
V. of LeRoy	5	1	B	4	B
B=Basement					
Y=Yard					
S=Structural					
C=Crops					
P=Property					
1= 1st Floor					

Map 4.2a

Additional Flooded Areas Oatka Creek Watershed, Genesee County



Data Sources:

Flood Zones - FEMA
Watersheds - NRCS
Parcels - NYS ORPS
Municipal Boundaries - NYS DOT

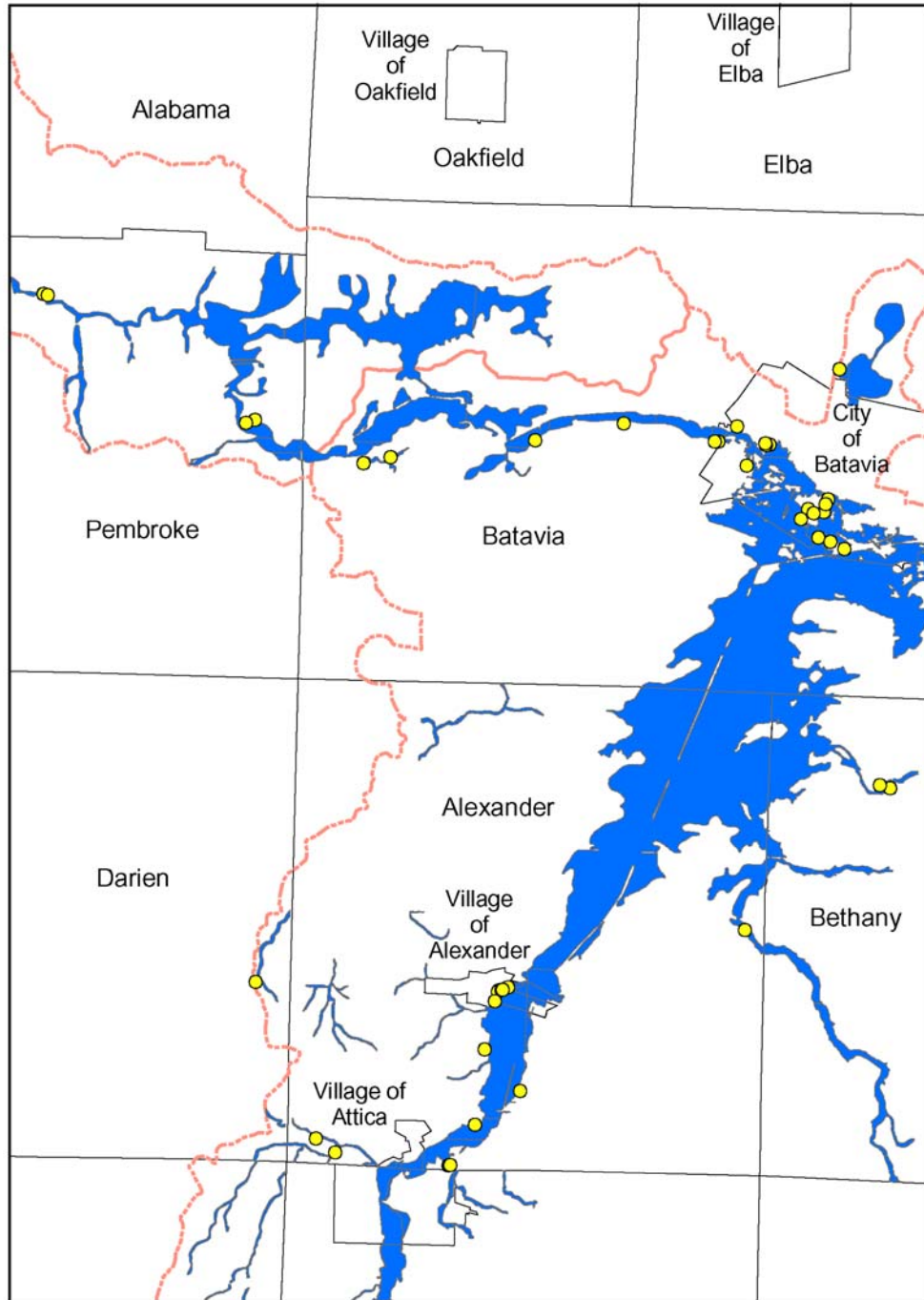
0 1 2 3 4 Miles

Prepared by Genesee/Finger Lakes Regional Planning Council



Map 4.2b

Additional Flooded Areas Tonawanda Creek Watershed, Genesee County



Data Sources:

Flood Zones - FEMA

Watersheds - NRCS

Parcels - NYS ORPS

Municipal Boundaries - NYS DOT

0 1 2 3 4 5 Miles

Prepared by Genesee/Finger Lakes Regional Planning Council



4.3 General Flood Hazards

4.3.1 Structural Damage

Several factors related to flooding may cause structural damage. Structures such as homes and businesses may be swept off their foundations and carried downstream by fast-moving flood waters. Structures such as bridges and houses may also be damaged by impacts from debris carried in fast-moving flood waters. Flood waters also erode and undercut streambanks, threatening foundations of nearby structures. Wood structures that are flooded for long periods of time may develop dry rot as a result of waterlogging.

Structural damage has been reported to utilities carried on the Railroad Avenue bridge in the Village of Alexander. Structural damage related to flooding has also been reported for residences, businesses and municipal buildings in Pavilion, Attica, Alexander, Batavia and LeRoy.

4.3.2 Floodplain Development and Impervious Surfaces

Flood plains and associated wetlands have a critical role in maintaining the overall flow regime in riverine systems. A river overflows into the flood plain when it exceeds bankfull discharge. Vegetation and organic litter, such as fallen leaves and branches, trap precipitation and release the water slowly into streams after a storm event. However, impervious surfaces such as pavement, building roof tops, and other hard surfaces immediately shed the water which falls on them. When land is cleared of vegetative cover and organic litter, and when impervious surface increases in a watershed, rainfall moves more quickly into streams. As this occurs, the frequency and height of floodplain overflow both increase, often significantly affecting land uses in or near the floodplain.

In the Town of Batavia, the West End Trailer Park and the Batavia Mobile Home Park are located adjacent to the channel of Tonawanda Creek. Residents are regularly evacuated from these parks during flood events. Mobile homes sustain damage and must be repaired or replaced. Infrastructure such as septic system leach fields may also be affected.

Large commercial developments have been permitted in low-lying, poorly drained areas in the northwest corner of the Village of LeRoy. Flooding problems in these areas have been exacerbated by an increase in the amount of impervious surface. Water that used to infiltrate the ground under pre-development conditions now runs off into a tributary of Oatka Creek or ponds in parking lots. Stormwater detention basins which were intended to receive stormwater during rainfall events are full of ground water due to the high water table. Stormwater from the paved surfaces and building roof tops overtops the detention basins, surcharges storm sewer pipes, and ponds in parking lots and buildings. This type of flooding has far-reaching economic effects on the community. Business operations have been affected at the Tops Market and Rite-Aid Drug Store.

The Valu Plaza, located in the flood plain of Tonawanda Creek in the Town of Batavia, was flooded during the 1998 floods.

4.3.3 Debris

The accumulation of large woody debris in the channels of Tonawanda Creek and Oatka Creek was cited as the single most important cause of localized flooding in both study areas. Woody debris accumulates in the stream channels mainly due to water flow undercutting the stream bank. Live trees fall into the channel if their root bases are eroded away. Trees with large trunks and root masses partially obstruct flow in the channel, causing more small debris to accumulate around the larger masses. Other sources of woody debris include beaver activity along the banks, and timber harvesting operations that leave small woody debris scattered in a flood prone area.

In a recent study to determine the potential for stream channels to generate woody debris large enough to damage bridges, Diehl and Bryan (1993) concluded that bank instability seems to be the channel characteristic most useful in identifying channel reaches with high potential for production of large woody debris. Stream channels with high and steep banks, erodible bank materials, and a history of channel widening or lateral migration are capable of generating large quantities of woody debris.

Areas of Tonawanda Creek noted for debris accumulation include the reach west of the City of Batavia between Route 5 and South Main Street, and the “flats” area between Attica and the City of Batavia. These two reaches are characterized by large woody debris and sharp bends in the channel. A large pile of woody debris was noted in the Tonawanda Creek channel just below the Route 20 bridge in the spring of 2003.

Other types of debris may also accumulate in stream channels when floodplains or stream banks are used as dump sites. A former auto salvage yard is located adjacent to Tonawanda Creek in the Town of Batavia. Interviews with local officials indicate that non-woody debris such as junk cars is sometimes found in the stream channels.

4.3.4 Siltation

Siltation is a general term referring to fluvial (river-transported or deposited) sediment. Siltation results when stream banks are eroded and sediments are transported and deposited downstream in the channel. Siltation results when upland areas are farmed, and soil erodes from field surfaces. Other land uses such as timber harvesting, road building and other land development activities cause silt to be deposited in stream channels when it is not properly contained.

In both Tonawanda and Oatka Creeks, gravel and sediment washes into the stream channels from unvegetated road cuts, and steep hillsides. Excessive siltation in gravel beds can adversely affect the quality of salmonid spawning areas. This is particularly an issue on Oatka Creek, which is known as an important salmonid fishery resource.

The accumulation of silt in drinking water reservoirs is a potential problem in the Village of Warsaw and Village of LeRoy reservoirs. Excessive siltation from heavy downpours may also damage water filters in operation at the water treatment plants.

Excessive suspended silt loads adversely affects the quality of the stream channels, causing turbidity and carrying nutrients and pesticides. The Oatka Creek Watershed “State of the Basin” report (2003) identified silt as being the primary pollutant in Oatka Creek. In Genesee County, the primary source of this silt was identified as agriculture.

4.3.5 Culvert Maintenance and Sizing

Inadequate culvert maintenance and sizing was identified during the interview process as being an important cause of localized flooding. The problem results when gravel and soil is washed into roadside drainage ditches and deposited in culverts. If culverts are not cleaned regularly, sediment accumulations reduce the capacity of the culvert to carry channel flows during storm events.

In the Oatka and Tonawanda Creek watersheds, residents and local officials reported flooding caused by clogged culverts under active and abandoned railroads. The problem is particularly acute in the Village and Town of Alexander and in the Village of LeRoy. The problem of culvert cleanout is exacerbated with abandoned railroads because responsible parties are difficult to contact. If responsible parties can be found, they may not have funds or manpower to complete the task.

Clogged road culverts often cause flooding problems along Route 19 in Pavilion and on Routes 20 and 98 in Alexander. Culvert maintenance along NYS highways is the responsibility of the NYS Department of Transportation (NYSDOT). The NYSDOT is also responsible for inspection of all structures, including culverts, greater than 5 feet in diameter or length. Culvert clogs on local and County roadways also cause localized flooding, and may cause damage to the road itself. Numerous problems with debris accumulation in culverts on local roads were reported in the towns of Pavilion and Bethany.

4.3.6 Dam Issues

Several dams are located within the stream channels of Oatka and Tonawanda Creeks. These dams are identified in [Table 4.2](#) and [Map 4.3](#). During the interview process, two problems with abandoned or inactive dams became evident. One issue is ownership. A broken dam was reported in Tonawanda Creek near North Pembroke Road in the Town of Pembroke. This former mill dam broke several years ago during a flood event, and has never been repaired. No owner has been identified for the structure. Debris from the broken dam causes flow in the creek to undercut the bank near the wingwalls for the North Pembroke Road bridge. Local officials agree that this structure should be removed because it threatens the integrity of the road bridge, but no responsible party has been identified.

Table 4.2 - Tonawanda and Oatka Creek Dams in Genesee County

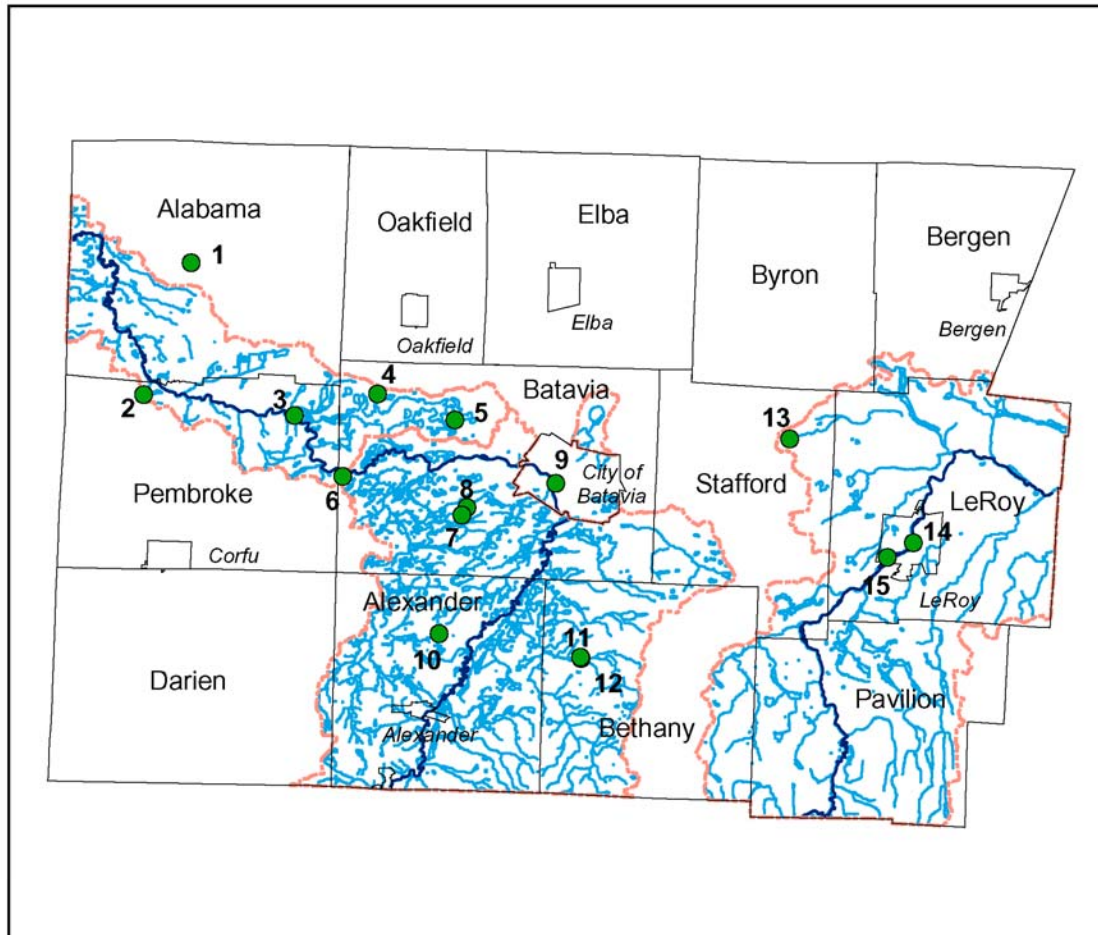
NAME	TOWNSHIP	OWNER	Stream	DAM LENGTH	DAM HEIGHT	DAM TYPE	OWN TYPE	PURPOSE	YR COMP
CRAWFORD DAM	PEMBROKE	FRED B CRAWFORD	TONAWANDA CREEK	155	9	BUTTRESS	PRIVATE		1840
BATAVIA MUNICIPAL DAM	BATAVIA	CITY OF BATAVIA	TONAWANDA CREEK	110	8	BUTTRESS	LOC GOV'T	WATER SUPPLY	1912
SMITH DAM	PEMBROKE	CHARLES SMITH	TONAWANDA CREEK	150	6	GRAVITY	PRIVATE		1860
EDDY ROBERTSON DAM	STAFFORD	EDDY ROBERTSON	OATKA CREEK	0	7	EARTH	PRIVATE	RECREATION	1964
OATKA CREEK DAM	LEROY	VILLAGE OF LEROY	OATKA CREEK	196	15	GRAVITY	LOC GOV'T	OTHER	1934
OATKA CREEK DAM	LEROY		OATKA CREEK	280	12	GRAVITY		RECREATION	
HORACE BLOOD MARSH DAM	BATAVIA	HORACE BLOOD	TONAWANDA CREEK	0	5	EARTH	PRIVATE	RECREATION	1950
CLEMENS&DIEGELMAN DAM	BATAVIA	CLEMENS&HERBERT DIEGELMAN	TONAWANDA CREEK	0	8	EARTH	PRIVATE	RECREATION	1953
EDWIN CHASE POND DAM	BATAVIA	EDWIN CHASE	TONAWANDA CREEK	0	7	EARTH	PRIVATE	RECREATION	1952
KLOSSNER MUSKRAT MARSH DAM	ALEXANDER	HAROLD BROWN	TONAWANDA CREEK	0	6	EARTH	PRIVATE		1958
KISTNER SETTLEMENT POND DAM	BETHANY	CAROL A KISTNER	TONAWANDA CREEK	1000	28	EARTH	PRIVATE	RECREATION	2000
KISTNER MAIN POND DAM	BETHANY	CAROL A KISTNER	TONAWANDA CREEK	1277	13	EARTH	PRIVATE	RECREATION	2000
EDWIN CHASE FARM POND DAM	BATAVIA	EDWIN F CHASE	TONAWANDA CREEK	0	9	EARTH	PRIVATE	FIRESTOCK	1949
JOHN WHITE FARM POND DAM	ALABAMA	NYS DEC	TONAWANDA CREEK	0	7	EARTH	STATE		1952
INDIAN FALLS LAKE DAM		INDIAN FALLS LAKE CORP.	TONAWANDA CREEK	150	17	EARTH	PRIVATE	RECREATION	

A similar problem exists for the Munson Street dam in the Village of LeRoy. This dam apparently was constructed in the early 1900s to generate hydroelectric power for one of the local industries. That industry since left town, and ownership of the property has apparently reverted to the Village. At the time of our interview, this could not be verified. Site observation of this structure showed numerous leaks and chinks in the stone dam structure. The former superintendent of public works for the Village of LeRoy reported that this dam had not been repaired in at least forty years. The consequences of dam failure at this location may not be significant because the top of the Oatka stream bank is much higher than the top of the dam, but debris from a dam break at this location could cause damage to the stream bank further downstream in the Village of Leroy.

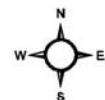
Numerous old mill dams were reported to be located along the channels of Oatka and Little Tonawanda Creek in the Town of Bethany. Major issues related to dams are identified in [Section 4.6](#), Specific Flood Hazards. Further evaluation of the condition of these structures is required.

Map 4.3

Genesee County Dams



- 1 - John White Farm Pond Dam
- 2 - Indian Falls Lake Dam
- 3 - Smith Dam
- 4 - Horace Blood Marsh Dam
- 5 - Clemens & Diegelman Dam
- 6 - Crawford Dam
- 7 - Edwin Chase Farm Pond Dam
- 8 - Edwin Chase Pond Dam
- 9 - Batavia Municipal Dam
- 10 - Klossner Muskrat Marsh Dam
- 11 - Kistner Main Pond Dam
- 12 - Kistner Settlement Pond Dam
- 13 - Eddy Robertson Dam
- 14 - Oatka Creek Dam
- 15 - Oatka Creek Dam



Data Sources:

Dams - Genesee County Emergency Management
 Watersheds - NRCS
 Hydrography - NYS DEC
 Municipal Boundaries - NYS DOT

0 5 10 Miles

- Genesee Dams
- Municipalities
- Watersheds
- Hydrography
- Creeks

Prepared by Genesee/Finger Lakes Regional Planning Council

4.4 Streambank Erosion

Streambank erosion is directly related to morphological and physical geographic features that affect lateral stream channel movement. Important morphological features include channel depth, gradient, current velocity, bank height, soil type and type of substrate (e.g., bedrock, mud, gravel, etc.). Physical geographic features that affect stream location include the presence of hard bedrock materials, which may form waterfalls, barriers to lateral channel movement, or solution channels, which may cause streams to “go underground”. Land use practices and vegetation cover type also affect the amount of stream bank erosion that occurs in a given stream reach.

The upper reaches of Tonawanda Creek and Oatka Creek are characterized by steep slopes and high stream banks. Channel gradients are very steep, and strong, fast currents undercut stream banks, dislodge soil and carry it downstream to be deposited in gravel and silt bars in slow-moving portions of the channel. In both stream channels, gravel is often deposited in or near road culverts or near confluences with tributaries that flow down from the steep hillsides into the valleys of the Tonawanda and Oatka Creeks.

Stream channels tend to erode fastest in areas where forest vegetation has been removed. Where a buffer of trees is maintained along a stream channel, the amount of erosion is lessened because tree roots stabilize the banks, and leaf litter reduces the potential for heavy rainfall to erode bare soil surfaces on steep slopes. Development of rill and gully erosion is evident in areas where agricultural and forestry best management practices have not been followed.

Stream channel meandering is most active in low-lying, flood prone valleys where agricultural lands are cultivated up to the top of the stream bank. Where a buffer of trees is maintained along the channel, meandering is less extreme.

Stream channel straightening has also contributed extensively to channel erosion and sedimentation downstream. This is particularly evident in the community of Varysburg where Stony Brook forms a confluence with Tonawanda Creek. This tributary was straightened during the 1950's, and deposited a large sediment load in the channel of Tonawanda Creek. The resulting sand and gravel bars caused the channel of Tonawanda Creek to meander more than usual, and contributed to downcutting and eventual resumption of meandering by the Stony Brook tributary. While stream channel straightening may have provided short-term relief for some structures adjacent to Stony Brook, the resultant erosion and sedimentation created additional erosion and sedimentation problems downstream in Tonawanda Creek.

During a review of historic aerial photographs of the Oatka and Tonawanda Creek channels from 1938 to 2002, it became evident that two factors which strongly influenced the erosion potential for a channel reach included the presence of a forested buffer zone along the channel, and a lack of stream straightening activity. In virtually every instance where stream channel straightening was attempted, the channel

eventually resumed its natural course, unless it was physically prevented from doing so by the presence of retaining walls.

4.5 Roads and Bridges

Genesee County Highway Department has maintenance responsibility for all bridges, culverts and other structures over five feet in any dimension (width, length, diameter). NYS DOT inspects all bridges and culverts over five feet in dimension every year. The Genesee County Highway Department noted that in general there is poor hydraulics (bridge openings are not large enough) on bridges, especially on Peaviner Road Old Creek Road bridges over Tonawanda Creek. Specific flood hazards associated with roads and bridges are identified in [Section 4.6](#), Specific Flood Hazards.

4.6 Specific Flood Hazards

The following section is meant to give a description of specific flood hazards that have been identified through the hazard assessment process. Site numbers (specific sites or areas) are indicated in parenthesis and are shown on [Map 4.4](#). All sites were ranked based on a priority site evaluation methodology (see [Appendix E](#)).

Town of Alexander

Peaviner Road Bridge over Tonawanda Creek (191) – Bridge floods frequently in the spring and floods during heavy rain events. Flow from Creek goes over road frequently causing pavement and shoulder washouts which requires frequent repair by local highway department. Possible emergency access issues.

Cookson Road Bridge over Tonawanda Creek (106) - Bridge is out of service. Road floods and washes out frequently causing a maintenance issue.

Dorman Road (107) - There are several residences in the floodplain. There are two large wetland restoration projects in vicinity. Stream channel has little or no buffer from crop land. Special steel bridge used on creek seems to withstand floods well.

Railroad grades through Town (193) - There are two old railroad grades that run north-south through the Village. They tend to prevent west-flowing drainage to the creek and back up water on the east side. The eastern of the two grades is active south of Railroad Avenue to the mainline at Attica and is operated by CSX. North of Railroad Avenue, it is owned by the NYSDEC and used as a recreation trail. The western of the two grades has long been abandoned and is significantly overgrown in parts.

West Bethany Road (194) - Erosion problems south of Brookville Road.

Stroh Road railroad crossing (196) - This is an active line that has a history of seasonal flooding. Commercial property is impacted by flooding.

Village of Alexander

Richardson House/Stroh Road (100.02) – The property is left isolated during flood events. Property has experienced loss of land due to erosion from creek. Rail grade crossing at Stroh Road - the line is active and floods during high water events.

House with poured concrete floodwall (101.03) - House on the north side of Railroad Avenue with a recently constructed, private, poured-concrete, “dike” around the house with home-made wooden “floodgates” that block off the driveway in times of flood.

Potential exposure of sanitary sewer mains along streambank (102.01) - Stream channel gradient very low. Area needs to be cleared of snags and logjams regularly.

Railroad Avenue bridge piers (104.04) - Log jams and debris accumulate around bridge piers.

Railroad Avenue, from Main Street eastward to the old RR grade (153) - This area has regular flooding problems. There are two old railroad grades that run north-south through the Village. They tend to prevent west-flowing drainage to the creek and back up water on the east side. The eastern of the two grades is active south of Railroad Avenue to the mainline at Attica and is operated by CSX. North of Railroad Avenue, it is owned by the NYSDEC and used as a recreation trail. The western of the two grades has long been abandoned and is significantly overgrown in parts.

Route 20 east of Tonawanda Creek (154) – The roadway floods before bridge. Water goes over Route 20 with more frequency. The problem is exacerbated by braided channels with numerous log jams. A log jam is located in Tonawanda Creek channel north of Route 20.

Route 20 bridge over Tonawanda Creek (155) - There is a large log jam downstream of Route 20. There was disagreement between the Village DPW and NYSDOT as to the integrity/vulnerability of the Route 20 bridge. Village says that silting under the bridge is causing problems and that DOT won’t remove it. Village maintains that the bridge is in danger, especially since a large log jam just north (downstream) of the bridge could affect it and back up water.

Sewer plant outfall (158) – The sewer plant outfall pipe at north end of Village is threatened by streambank erosion.

Bridge over Tonawanda Creek tributary (159) - This is a small bridge between the back of the central school campus on Buffalo Street and the Alexander Fire Department Recreation Center on Route 98. The bridge crosses a small tributary of the Tonawanda, but is frequently washed out. The bridge is used by the school students and staff to reach the recreation center when evacuating the school, rather than using Route 98.

Telephone (Railroad) Road over Tonawanda Creek (160) - Sewer and water mains cross the creek on the Railroad Ave. The bridge was damaged in 1998 flood. Village received \$16,000 from FEMA to replace mains and move one of them higher up on the bridge. The bridge was rebuilt by the County in 1991 and the County engineer told the Village that the bridge would not be lowered, but the Village maintains the rebuilt bridge is in fact lower. The Village maintains that installed rip-rap has restricted the flow.

Village of Attica (Genesee County portion)

Plaza on Prospect Street (150) - This is adjacent to the Medical Building at 116 Prospect Avenue and the daycare center at 107 Prospect Avenue (Site 145) which are priority sites (see Priority Sites section below).

City of Batavia

City of Batavia Wellhead Protection Area (109.01) - Cedar Street wells are in the floodplain. Wells may have casing tops below height of 100 year flood.

Chapin/Old Sylvania Plant (110) – This is a former electronics plant that may have industrial contaminants on site and is located in the 100-year floodplain. The status needs to be checked with NYSDEC/USEPA.

Cedar Street Railroad underpass (110.01) - This site floods out with heavy rainfall, especially if sewer pump station is out of service.

Genesee County Highway Department (110.02) - This site is isolated during flooding events. Site can not be accessed from Route 63 or Cedar Street because both are flooded.

Law and Walnut Streets (166) - Flooding issues.

Oakland Avenue levee (169) - The ACE constructed a levee along Oakland Avenue near Kibbe Park in the 1940's. There was severe flooding in the Kibbe Park area in 1942.

Tonawanda Creek channel, south of NYSDEC dams (174) - The City would like to obtain more easements along Tonawanda Creek south of the DEC dams. At the present time, they have no easements and cannot go in and clean debris out of the channel. The land along the channel is all in private ownership.

Jackson and Oakland Avenues (171) - Erosion problems have been experienced at a private residence near the intersection. An outbuilding is located near the creek bank. The homeowner tried to put in some erosion protection, but it was designed improperly.

The big ditch (175) - This is a tributary of Tonawanda Creek that drains the north side of the City. It was placed underground in a tunnel structure 75-100 years ago. Concerns

include age and condition of the structure, access and maintenance, and impacts if it ever collapsed or was blocked. The structure also runs through or along basements in this part of the city. Finally, it is not included on FIRM and perhaps should be, since it really is a natural drainage feature that still functions, albeit underground.

Tonawanda Creek near Kibbe Park (172) - The ACE has been involved in dynamiting ice jams in and around Kibbe Park on the south side of the City. This area is subject to erosion with ice jamming.

City of Batavia DPW facility on Route 98 - This site is isolated during flooding events.

Town of Batavia

Tonawanda Creek from Dorman Road to south of Batavia City limit (108) - There are problems on the east side of Route 98 including farmland up to creek and severe streambank erosion on high banks (undercutting is main problem). Banks are six to eight feet high with erodible soils. Potential of additional flooding problems with increasing development pressure. Three to four homes are threatened in this area every year.

Stegman Road (113.01) – The road floods out frequently due to ice jamming. These roads are closed and under water on an annual basis.

Wortendyke Road bend in Tonawanda Creek channel (116) - A right angle bend in channel causes ice jamming and Stegman Road flooding.

Route 5 (Bushville) bridge over Tonawanda Creek (116.01) - The Bushville bridge is an older truss bridge between two sharp bends in the Tonawanda Channel. The area is subject to ice jamming in the spring, which wears away at the bridge abutments. The abutments show some signs of wear and spalling, but overall the structure is still rated as serviceable in the NYS Bridge Inventory.

Valu Plaza, West Main Street (162) - Consistent with other flooding problems along West Main Street.

Areas south of South Main Street (163) - The area south of South Main Street is not shown on the flood map, but perhaps should be. It is at the same elevation as the land on the north side of the road and flood water from the creek backs up through culverts under the road. The county reports that residents have requested flap-gates on these culverts. These block water from the creek, but back up the northward flowing drainage and lead to flooding on the south side of South Main Street anyway.

Tonawanda Creek tributary near Route 63 and Veterans Road (164) - There is a flooding problem with a small, apparently unnamed tributary of Tonawanda Creek that drains the suburban commercial area along Lewiston Road, Park Road, and Veterans Road. This flows southwest and crosses under Lewiston Road (Route 63) near Veterans Road.

During heavy rain events, this floods yards and homes in the vicinity. Previously, a small box culvert under Route 63 prevented this problem by retaining water on the northeast side of the road and draining it gradually. The small culvert was replaced by a 54" arch pipe and therefore does not retain the water. The town installed and maintains a small earthen dam/weir in this area about 1999 to retain water and prevent flooding.

Town of Bethany

Little Tonawanda Creek - Hamlet of Linden (124) – The Ray Zigrossi home is in the floodplain on the west side of Mill Road. Five to ten homes may be affected by flooding along Little Tonawanda Creek between West Bethany, East Alexander and Linden. In 1992, the Zigrossi house on Mill Road was knocked off its foundation by a flood. On July 8, 1998, the Fire Department had to rescue several people from houses on Mill Road, notably Zigrossi's. Some residents on Linden Road also had to be evacuated.

Gick Creek and Conway Road (180) - Land is low-lying and has debris and beaver dams. The creek floods yards and a field.

Mill Road (178) - Mill Road sustains damage frequently. The town has requested that ACE clean the creek in this area. There is significant erosion problems in this area.

Francis Road (179) - Flood, erosion and water over the road frequently.

Little Tonawanda Creek, near Route 20 (181) - Fire Department regularly pumps out flooded basements of homes

Little Tonawanda Creek, Mill-Linden Road area (182) - There is major channel debris accumulation in this area.

Smith Road (183) - There is erosion and flood issues.

Town of Darien

Route 20 (185) - Clogged culverts causes minor annual spring flooding

Darien-Alexander Townline Road and Old Attica Road (186) - Flooding causes shoulder erosion along roads.

Town of LeRoy

Greenhouse in floodplain (505.01) - Business is in the floodplain. There are potential contamination issues.

Oatka Trail-Wilcox Road area flooding (522) - There is residential development in flood plain. Trail floods out frequently. Flooding where several tributaries enter Oatka Creek in the Parmelee Road area near Fort Hill.

LeRoy Airport Area (509) - Airport runways are in the flood plain and were filled during recent airport improvements. Studies indicated that flooding situation would not be worsened by airport improvements. This has not proven to be the case.

LeRoy Water Filtration Plant (516) - There is heavy potential flooding. A tributary flows in this area.

Quinlan and Keeney Road flooding (519) - There is flooding from both sides. Water has backed up to Rite Aid store.

Country Club (523) - Country Club property will flood.

Village of LeRoy

Main Street Dam (513) - The dam has structural issues.

Wolcott Street (514) - This is an area of extensive streambank erosion on the east side of collector. Main sanitary sewer parallels the creek in this area and the man-hole will overflow during flooding events.

Pro-Fac Plant (520) - Area floods regularly

New school in potentially flooded area (521) - New school between two minor tributaries. This will cause affects downstream in Village.

Munson Street Dam (524) - Dam has structural issues. It has been damaged. It was formerly used to generate hydroelectric power but hasn't been maintained in many years. That dam probably belongs to the Village.

Town of Pavilion

Houses on Pavilion Center Rd by Rochester Southern RR (511) - Flooding occurs regularly in Pavilion Flats.

Flooding problems in hamlet along small tributary between Route 19 and Route 63 (561) -Creek runs very close to building (including gas station) foundations, in this area.

Culverts clogged along Route 19 south of the hamlet (562) - Clogged culverts contribute to water backing up to the east of the highway.

Clogged railroad culverts (562.01) - South of hamlet.

Hanson's Concrete Plant and headquarters (566) - This is a significant industrial site and employer in the Town. It is located in the hamlet area near Oatka Creek, across Route 63 from the Town complex. Has been subject to flooding in the past. Relocation

of the headquarters building or moving of vital records and business operations to a less flood-prone location would probably be the only remedy. The plant area is likely to flood on a fairly regular basis.

Bank Erosion between Route 20 and Route 63 (567) - Seen bank erosion in several places, mainly impacting farmland.

Town of Pembroke

East Pembroke Dam (114) - Old structure that may be failing. Genesee County Highway Department indicates that dam has been breached causing silt to accumulate around bridge pier. NYSDEC identified owner but could not locate. NYSDEC recommended that dam should be removed.

Thruway bridge over Tonawanda Creek (114.01) - The Thruway flooded some years ago in this area. Studies have shown undersized culverts and need for additional detention.

North Pembroke Dam (115) - This is an old mill structure. This structure is deteriorated and is only visible along one bank. The dam was breached several year ago. There is a question as to whether structure is needed and who has maintenance responsibility. NYSDOT have inspected dam and found significant siltation at center pier.

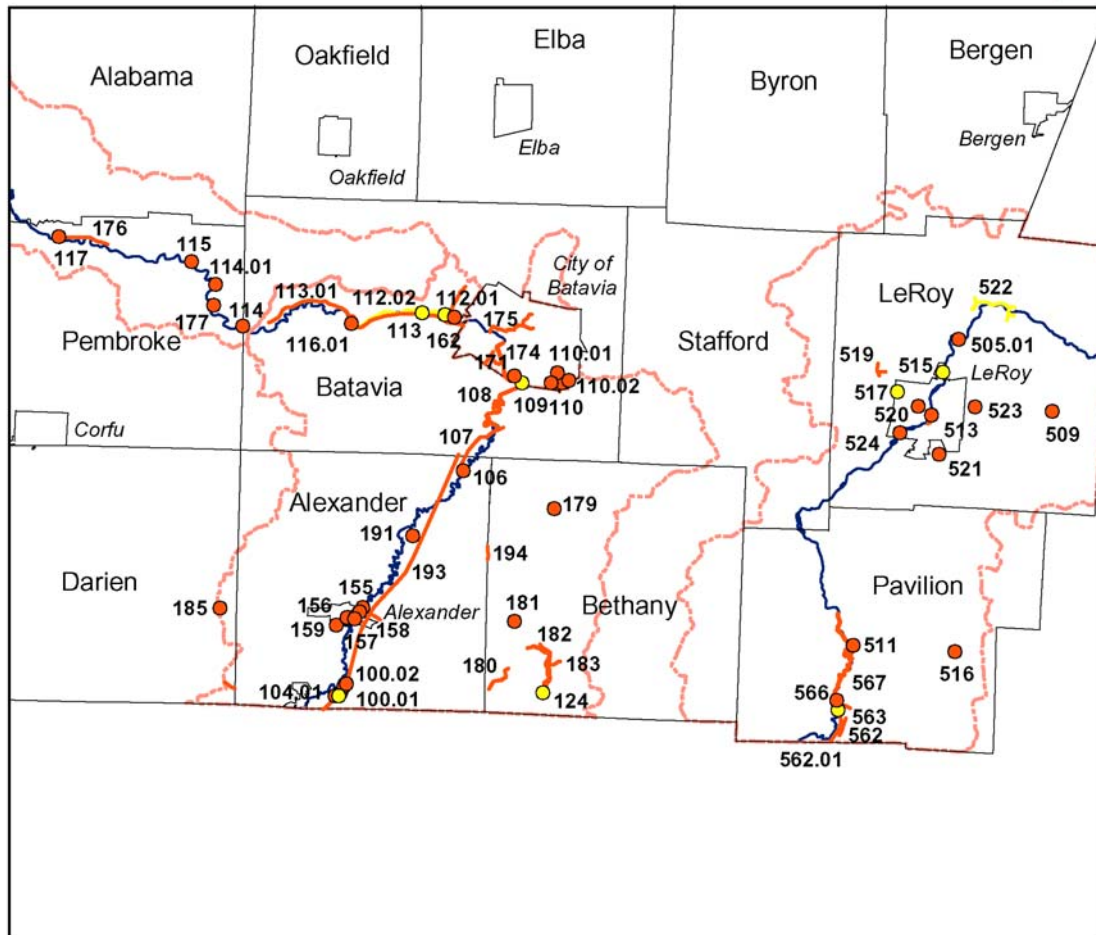
Indian Falls Hamlet (117) - Houses are close to stream channel. There is weathering rock and erosion issues as well as a sewer outfall into Tonawanda Creek.

Phelps Road (176) - Field flooding. Limited impact on residential properties.

Pratt Road (177) - Minor over the road flooding.

Map 4.4

Specific Flood Issues, Genesee County



Specific Flood Issues

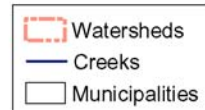
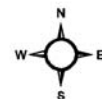
- Priority
- Non-priority
- Priority
- Non-priority

Data Sources:

Specific Flood Issues - G/FLRPC
Watersheds - NRCS
Hydrography - NYS DEC
Municipal Boundaries - NYS DOT

0 5 10 Miles

Prepared by Genesee/Finger Lakes Regional Planning Council



4.6.1 Priority Site Evaluation

Eleven sites were selected for detailed analysis to determine potential causes and solutions for flooding on high priority sites. Air photos from 1938, 1954, 1963, 1968, 1974, 1985 and 2002 were reviewed to develop a history of land use and stream channel morphology in the vicinity of the site. The Genesee County Soil Survey and

U.S. Geological Survey topographic maps were also utilized to develop information for each site.

Site 156 – Village of Alexander Sewer Pump Station, south side of Railroad (a.k.a. Telephone) Avenue, east of Tonawanda Creek bridge

The Village of Alexander Sewer Pump Station is located immediately east of the Tonawanda Creek Bridge on Railroad Avenue on the south side of the street between two meanders. The elevation of the site is approximately 900 to 910 feet above sea level. The site is located in a depression. The site is prone to frequent flooding because it is the lowest point for surrounding area. This site is approximately 1000 feet downstream from a tributary stream that flows off the hill from the Village proper. Numerous small tributaries connect to the Tonawanda further north (3500 feet downstream). Drainage across the site is controlled by the Railroad Avenue bridge over Tonawanda creek, by the road bed of Railroad Avenue and by a double set of railroad tracks located approximately 2400 feet east of the pump station site. When flood waters overtop the Tonawanda Creek bank, they may back up and are confined by the railroad tracks to the east of the site. Drainage is also affected by the flooding from the Tonawanda, the tributary that feeds it upstream and the tributaries that are located adjacent to the east of the site and feed the Tonawanda further north.

Soil types mapped for this site are mostly Genesee silt loam, surrounded by Eel silt loam. Both of these soils are subject to frequent flooding.

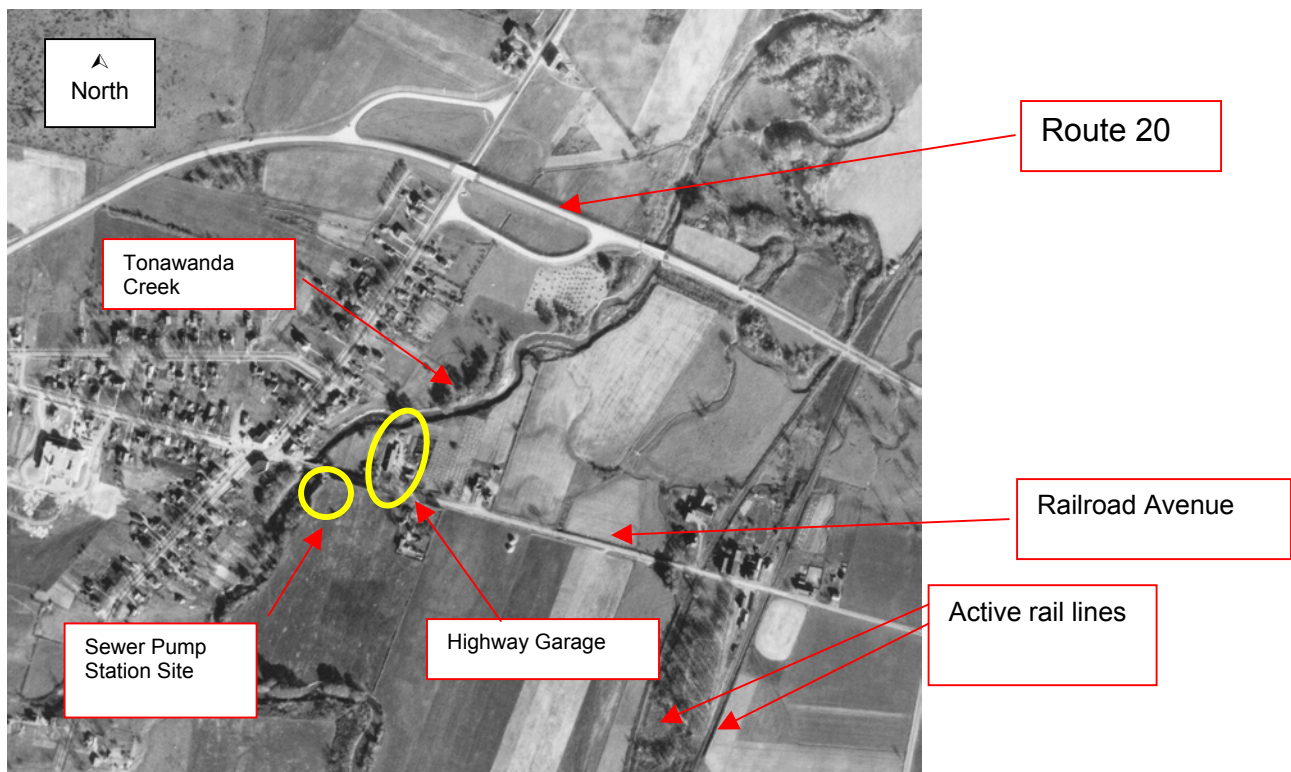


Figure 4.1a. Village of Alexander, 1938

The sewage pump and pump-house are not evident in the 1938 air photographs, and does not become evident until the 1984 air photographs. The 1938 air photos show clear evidence of former river meanders in the fields north of Railroad Avenue.



Figure 4.1b Village of Alexander, 1954



Figure 4.1c. Village of Alexander, 1963



Figure 4.1d. Village of Alexander, 1968



Figure 4.1e. Village of Alexander, 1974

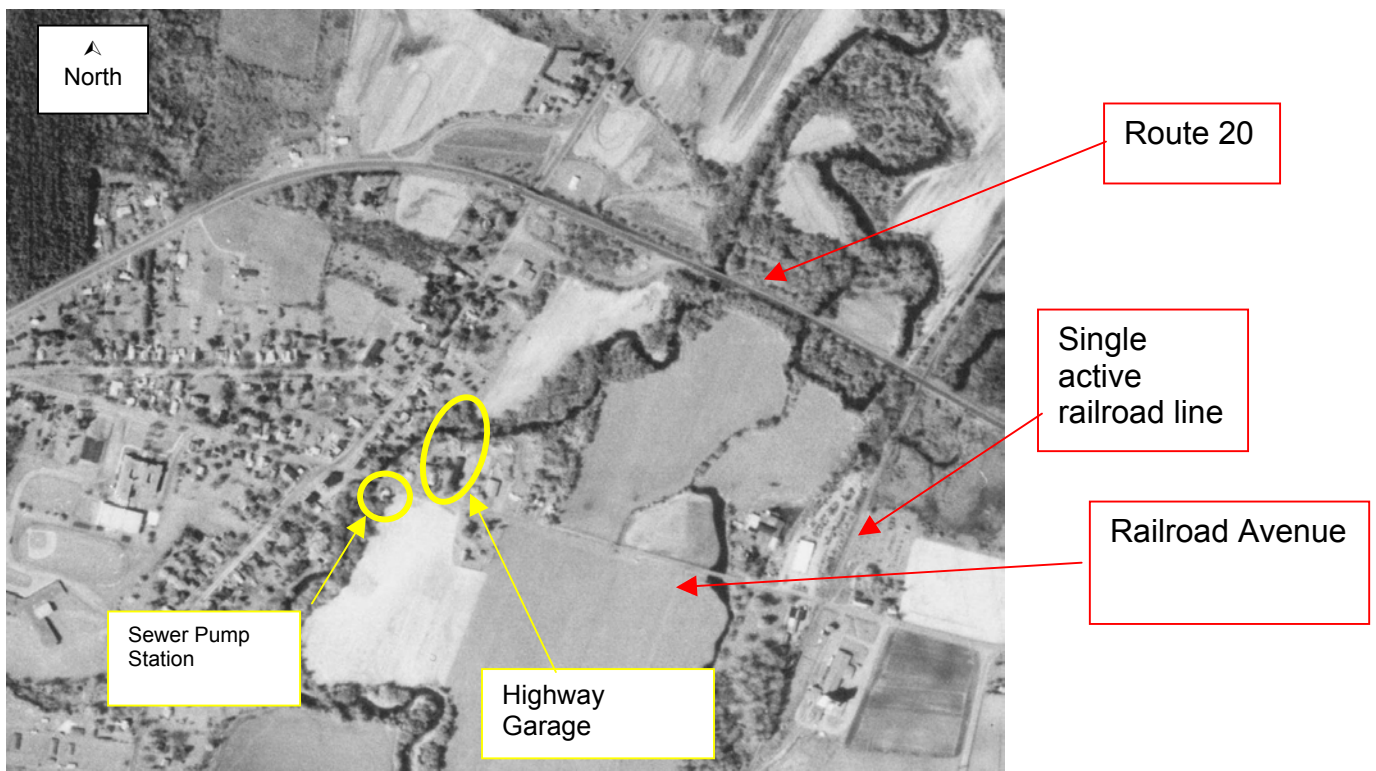


Figure 4.1f. Village of Alexander, 1985

By 1985 the area near the sewage pump station has been built up to include 10 different buildings. The roadways and bridges that the Tonawanda passes under have not changed from the first air photographs in 1938 based on measurements taken from air photos in 1938, 1954, 1963, 1968, and 1974.

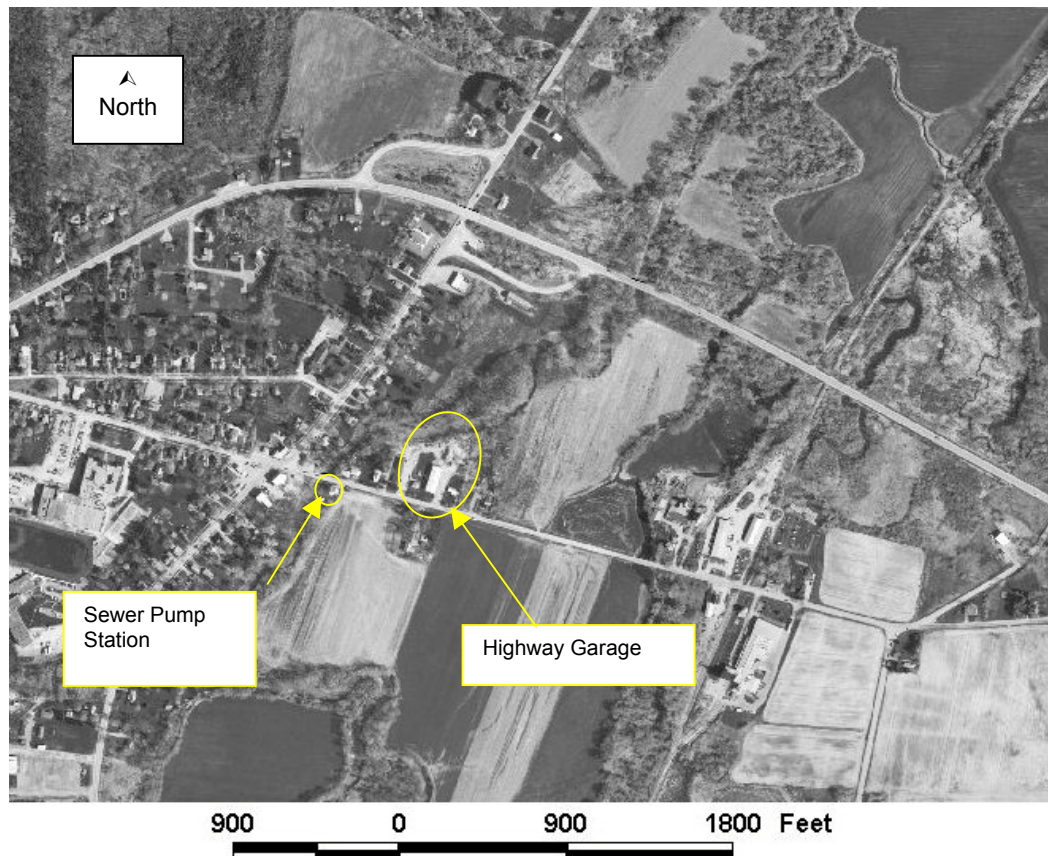


Figure 4.1g. Village of Alexander, 2002

In 2002 a second small building is evident next to the pump house south of Railroad Avenue. The Tonawanda channel has not experienced major changes to its course in this reach, and appears to be relatively stable in relation to the pump station. This conclusion is based on measurements of the stream bank taken from a known fixed point during review of air photographs dating back to 1938.

Flooding at this site seems to be caused by a combination of things. Sediment washes into the Tonawanda at the tributary stream south of the site. Excess sediment accumulation at the bridge can lead to blockage, along with log jams and ice-jams. The site is also located at the lowest point in the area and on soil that is very susceptible to frequent flooding. The road acts as a dam directing even more floodwaters directly onto the sewage pump site.

Site 157, Village of Alexander Highway Garage and Salt Storage barn, Railroad Avenue, east of Tonawanda Creek

The Village and Town of Alexander Highway garage and salt storage barn is located 350 feet east of the Railroad Avenue bridge over Tonawanda Creek. The elevation of the site is approximately 910-920 feet above sea level. The building is located on the north side of the road between the road and the creek. This site is approximately 1000 feet downstream from a tributary stream that flows off the hill from the Village proper. Numerous small tributaries originating 1800 feet east of the site connect to the Tonawanda further north (3500 feet downstream). Drainage across the site is controlled by the bridge, Railroad Avenue itself, and by two sets of railroad tracks located approximately 2000 feet east of the highway garage. Causes of the flooding at this site are similar to those described for the Alexander Sewage Pump Station.

Soil types mapped for this site are mostly Genesee silt loam, surrounded by Eel silt loam. Both of these soils are subject to frequent flooding.

The base flood elevation at the pump station site is 932 feet. Railroad Avenue forms a barrier to flood waters at this location. Railroad Avenue is also located in the 100 year flood plain.

Representative photos for this site are presented in Site 156 previously. In 1938 the distance from the South end of the highway garage building to the spot on the river directly north is 218 feet. Fields north of the site show evidence of old meanders. The fields are cultivated to the top of bank. An area of recent deposition and meander formation is located north of the highway garage site.

In 1954 the distance from the south end of the highway garage building to the spot on the river directly north is 220 feet. Two other small buildings have been built on the north side of the river next to the salt storage shed. A thin line of deciduous woody vegetation has developed along both banks of the Tonawanda Creek. A small tributary that flows under the railroad tracks has been channelized and flows north to a roadside ditch on the south side of Route 20. The area of active meandering in the 1938 photo is now lightly vegetated with young trees and shrubs.

In 1963 the distance from the south end of the highway garage building to the spot on the river directly north is 250 feet. The area to the east of the Tonawanda is farmland. Vegetation has developed along the channelized tributary visible in the 1954 photograph.

In 1968 the distance from the South end of the salt storage building to the spot on the river directly north is 230 feet. Some filling or grading is evident north of the highway garage adjacent to the east/south bank of Tonawanda Creek. Further north of this site, two areas of clearing are evident on the east and west banks of Tonawanda Creek, south of the Route 20 bridge. The photo is not clear enough to determine if these areas have been rip-rapped or stabilized in some other way.

In 1974 the distance from the South end of the salt storage building to the spot on the river directly north is 260 feet. Two more buildings have been built adjacent to the highway garage on the north side of Railroad Avenue on the east side of the Tonawanda. Farming appears to have ceased on the property immediately east of the highway garage. Farming continues on the property between the abandoned site and the railroad tracks. No significant changes to the channel are evident between Railroad Avenue and Route 20.

In 1985 the distance from the South end of the salt storage building to the spot on the river directly north is 240 feet. There are a total of 10 buildings on the north side of Railroad Avenue

In 2002 the distance from the South end of the salt storage building to the spot on the river directly north is 260 feet. A second long storage shed looking building has been built directly adjacent to the existing salt storage shed on the north side of Railroad Avenue. The Tonawanda at the point north of the salt storage shed seems to be moving away from the shed with some slight oscillations back towards. The channel has migrated 40 feet north of the site since 1938.

The result from the air photo interpretation measurements show the river to be moving slightly away from the highway garage site. Flooding at this site appears to be caused by a variety of factors including excessive siltation from the tributary stream. Log jams and ice jams can lead to blockage at the bridge and at the sharp bends in the river 250 feet downstream. The site is also located on soil that is very susceptible to frequent flooding. The railroad also acts as a dam directing even more floodwaters directly onto the storage shed whose northern end is within 100 feet of the stream bank.

Site 563 – Town of Pavilion, Town Hall, Library, and Highway Garage

The Town of Pavilion Town Hall and Highway Garage are located in a single building at One Woodrow Drive, south of Rt. 63 between the Rochester & Southern Railroad track and Oatka Creek. The Library is located adjacent to the Town Hall/Highway Garage in a separate building. The elevation of the site is approximately 930 feet above sea level. The site is located in a flat, flood-prone area adjacent to Oatka Creek. The site is also adjacent to a perennial tributary of Oatka Creek. The site is bounded by a tributary of Oatka Creek on the north, the Rochester and Southern Railroad track on the east, Oatka Creek on the west, and residential development to the south. Drainage across the site is controlled by culverts carrying the tributary under the railroad track and Woodrow Drive, and by flooding from the Oatka and its tributary.

Soil types mapped for the site include Eel silt loam, Wayland silt loam, Burdett silt loam (3-8% slope), Palmyra gravelly loam (0-3% and 3-8% slope), and Phelps and Fredon gravelly loams (0-3% slope). Eel and Wayland soils are formed on recent alluvial deposits of silt and fine sands. These soils are subject to frequent flooding, and offer only fair to poor stability for building foundations.

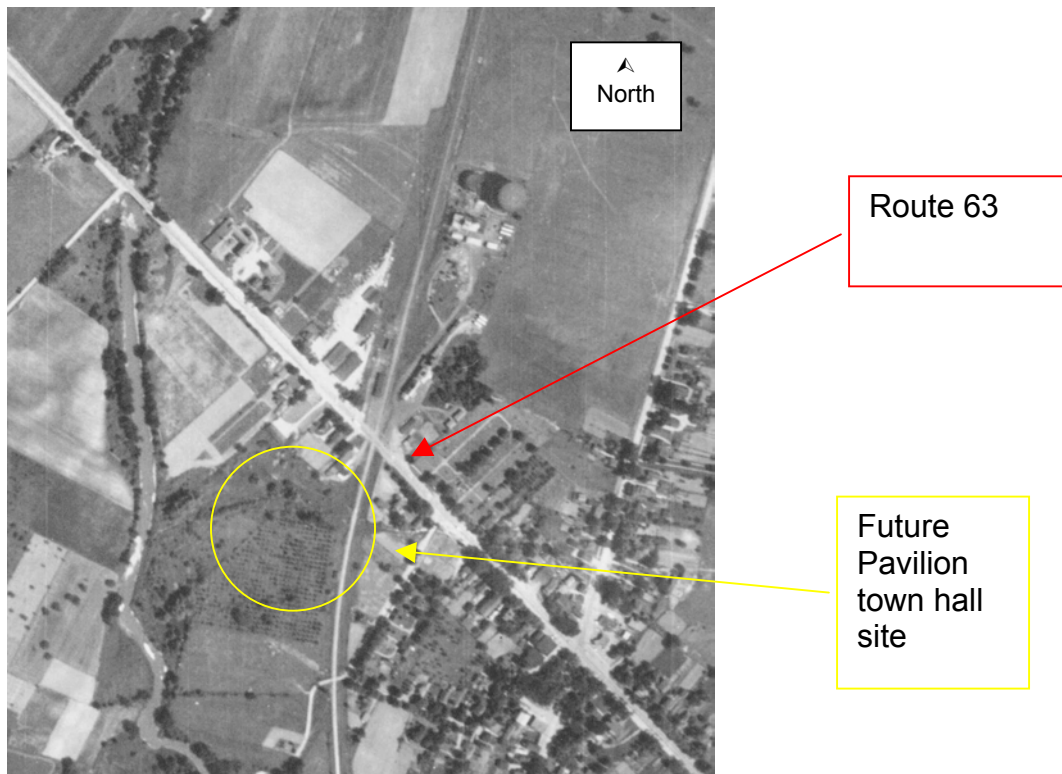


Figure 4.2a. Pavilion Town Hall Site, 1938

The Town Hall/Garage building and library buildings are not evident in the 1938 air photo. The site was vegetated with shrubs and young deciduous trees. The stream channel is not clear on the photo. The railroad track and roadway configurations are as shown in later photos. Land use north of Rt. 63 is agricultural field.

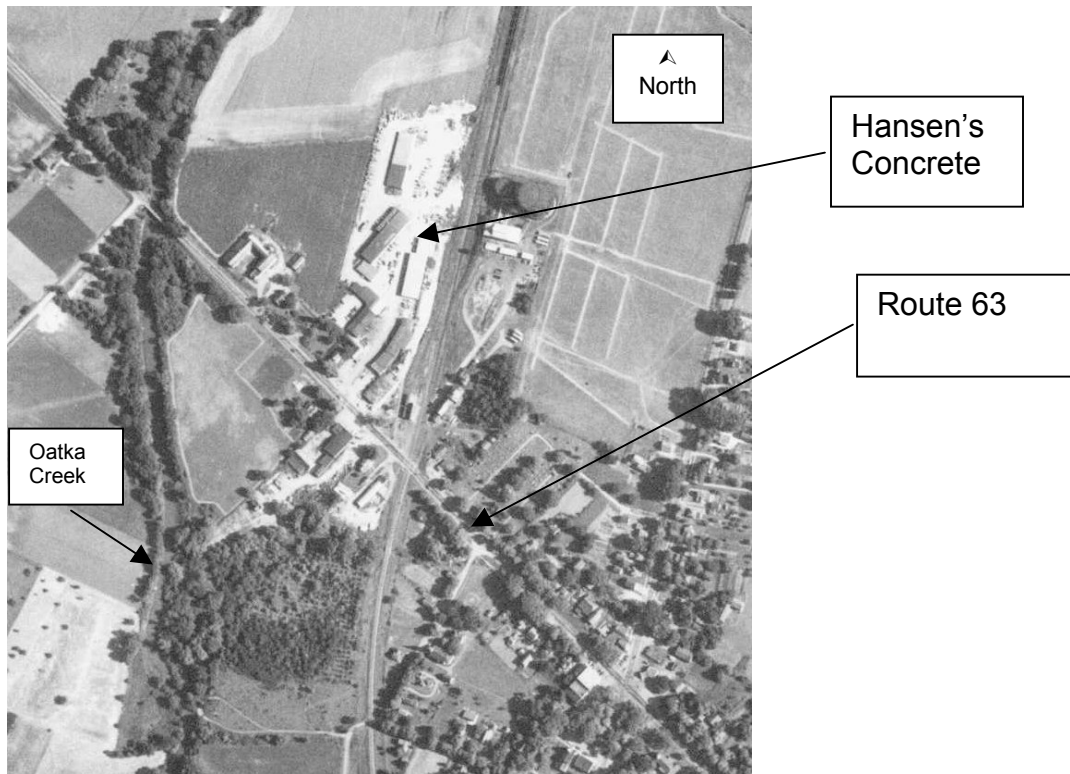


Figure 4.2b. Pavilion Town Hall Site, 1954

The 1954 photograph shows several new, large buildings located on the north side of Rt. 63 (Hansen's). The tributary channel is lined with brush and light woods. No Town facilities are evident on the photo.

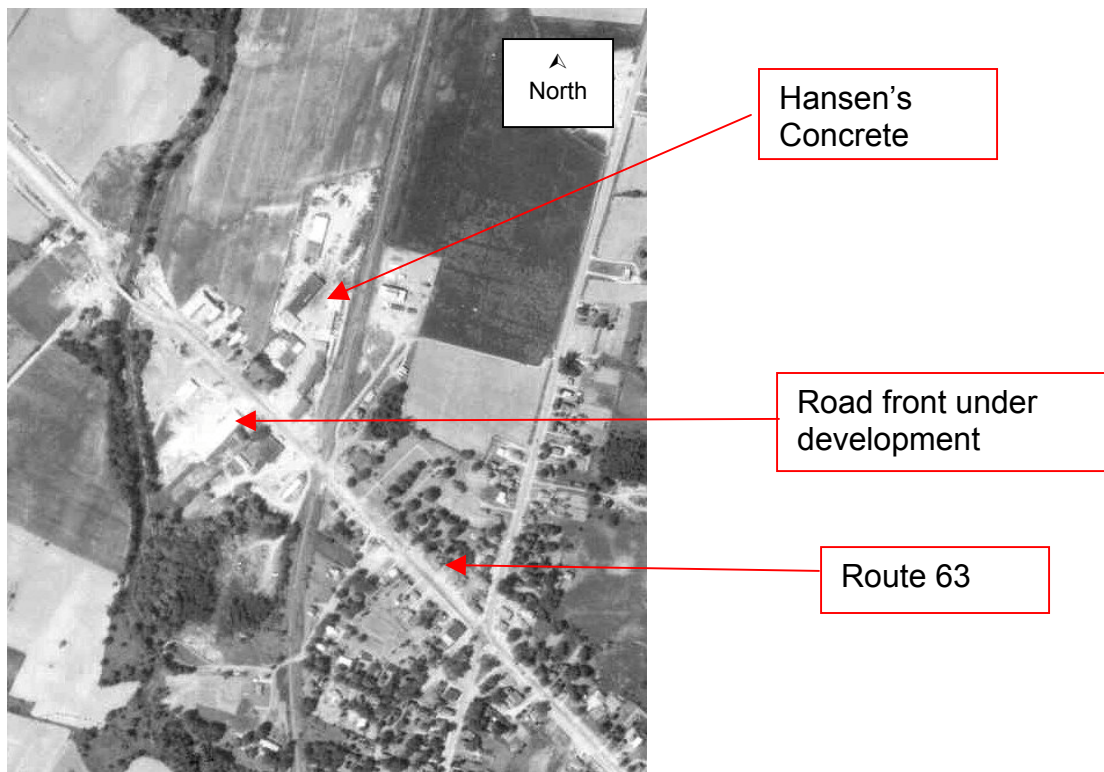


Figure 4.2c. Pavilion Town Hall Site, 1963

In 1963, the Town facilities are not evident on the photo. The site appears to be under construction and has been cleared of brush and woods. Surrounding areas outside of cleared area have grown up to more mature woods. The Hansen industrial complex appears to have expanded as well.

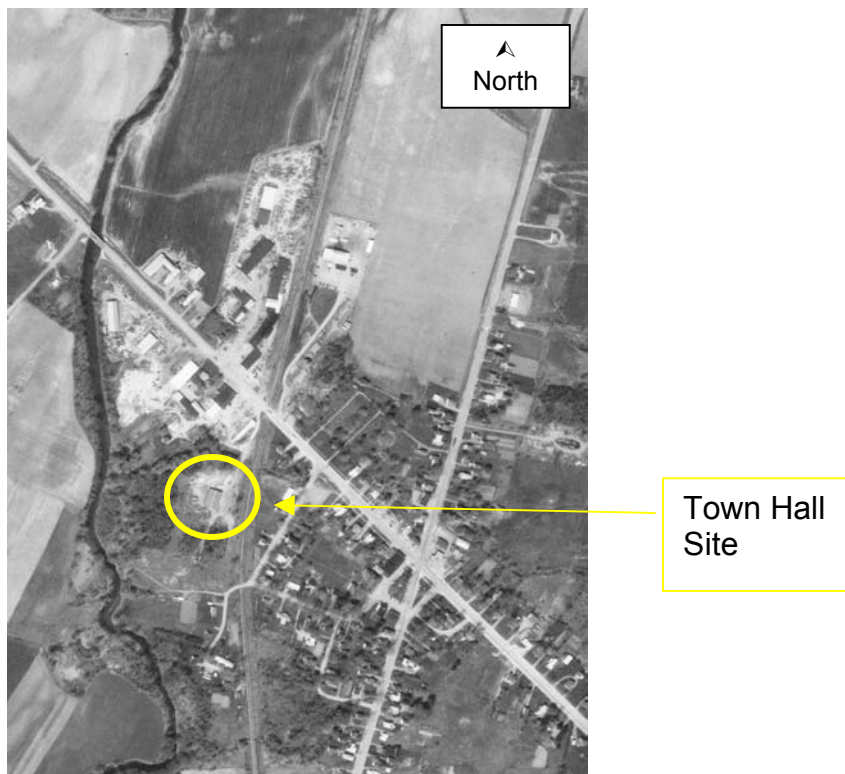


Figure 4.2d. Pavilion Town Hall Site, 1968

The Town Hall building is present on the 1968 photo. It is located approximately 150 feet south of the tributary stream and 900 feet north of Oatka Creek. The area immediately adjacent to the Town Hall site remains in deciduous woods. Development continues on the Hansen site and other adjacent properties.

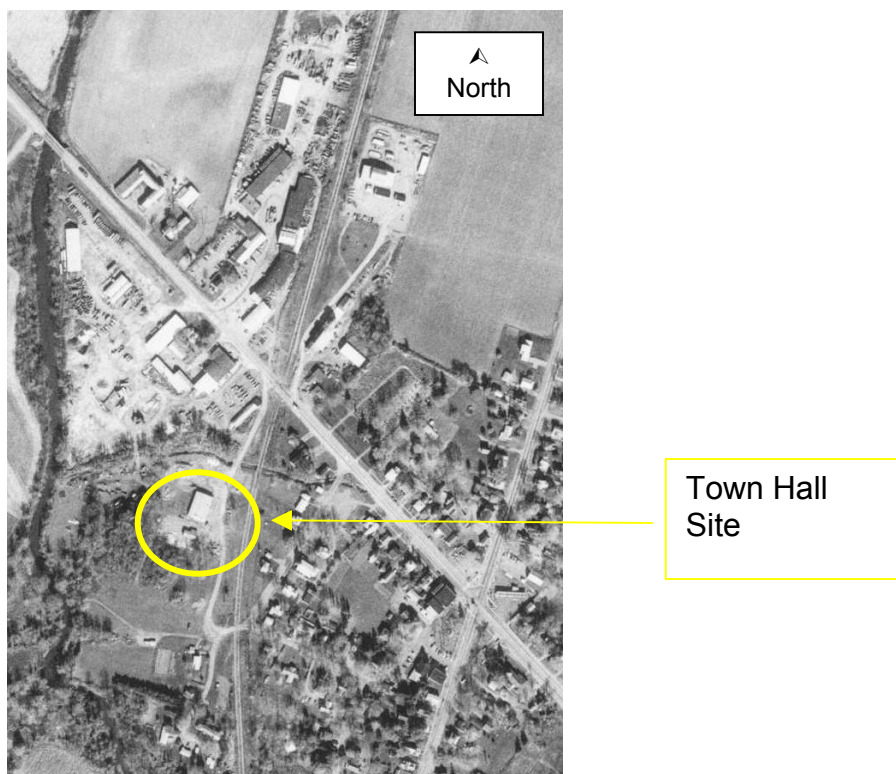


Figure 4.2e. Pavilion Town Hall Site, 1974

In 1974, a second smaller building is evident on the Town site. Deciduous woods around the site has been cleared. The tributary channel is quite prominent in this photo, possibly because the tree canopy was cleared. A new road has been constructed from the developed area north of the site, across the tributary channel to a parking area, adding another culvert crossing. The tributary appears to be piped in the vicinity of some houses near Rt. 63.

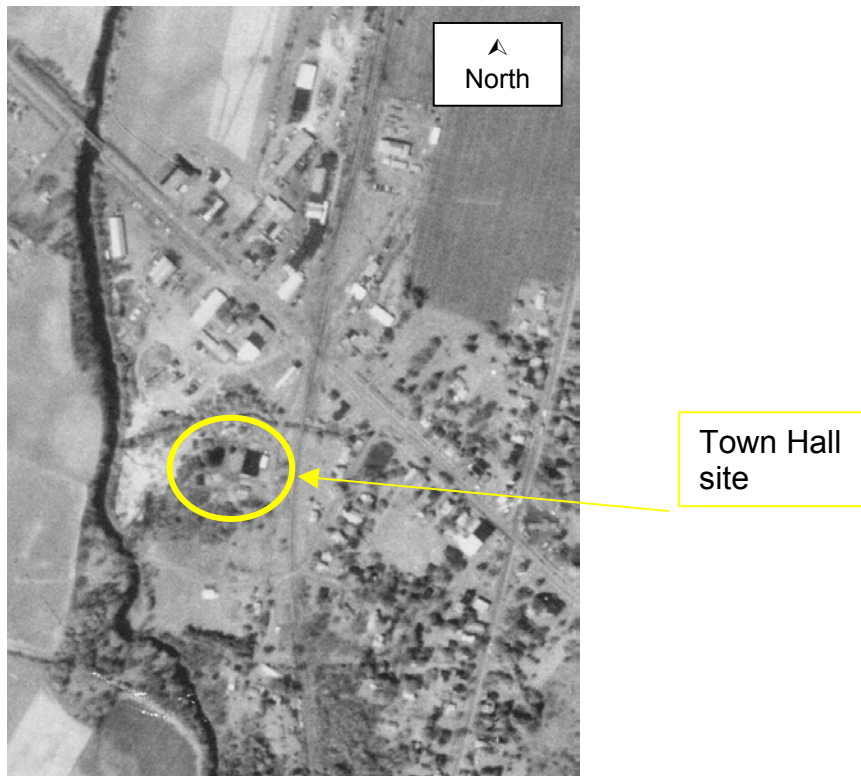


Figure 4.2f. Pavilion Town Hall Site, 1985

In 1985 an addition is visible on the Town Hall/Garage building. The tributary stream channel is developing a tree canopy.

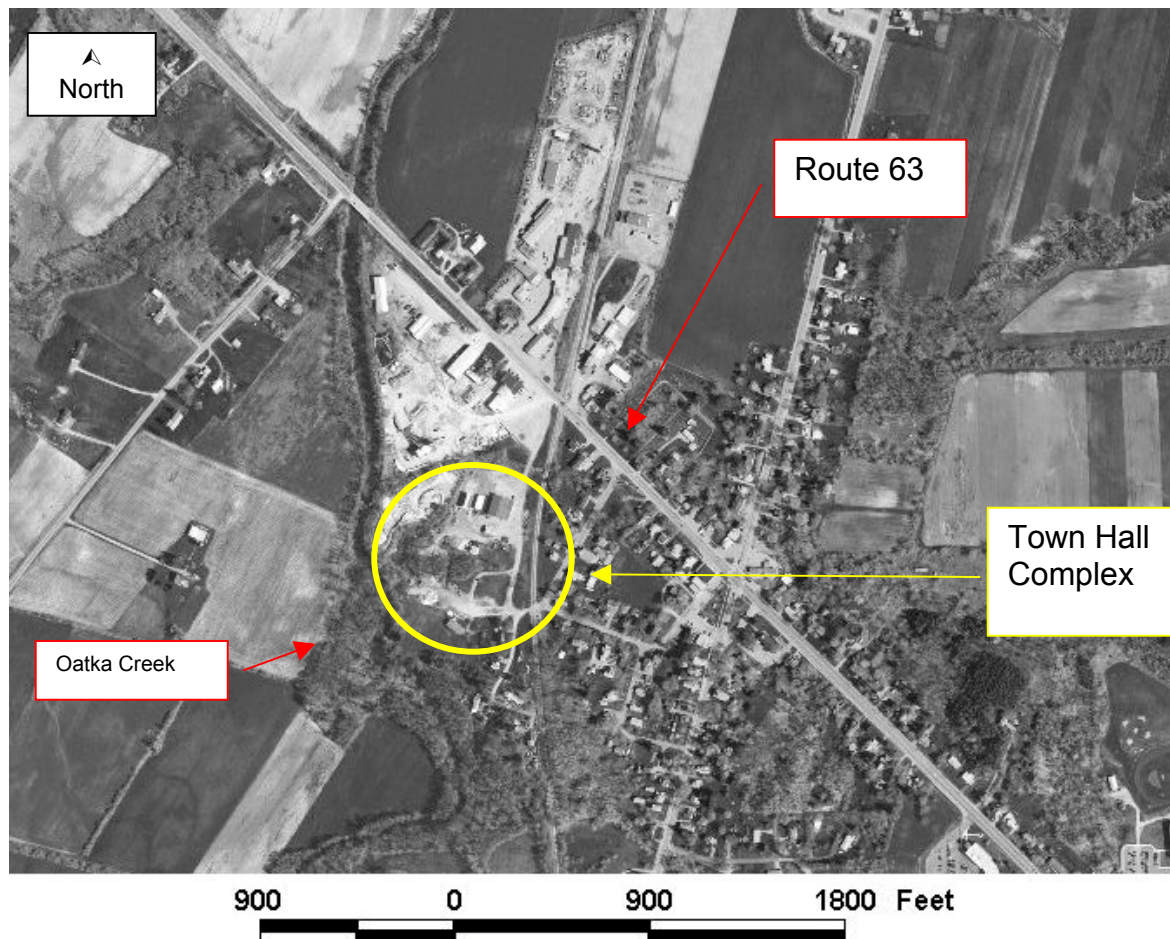


Figure 4.2g. Pavilion Town Hall Site, 2002

A second building has been added to the Town site in the 2002 photograph. The tributary channel appears to be stable and has not moved since the 1974 photograph.

Flooding at this site appears to be caused by proximity to the tributary stream. In 1998, community officials noted that the library and Town Hall had to be sand-bagged to protect the buildings. The Oatka channel south of this site meandered about 200 feet between 1954 and 1963. It appears that flooding may be confined on the site due to the presence of the railroad track. The railroad track appears to act as a dam, preventing flood waters from running off the site until general water levels have gone down on the creek. Debris and gravel accumulate in the culverts carrying the tributary under the railroad track and the roads, further reducing the capacity of these structures. When the creek floods, the water backs up from the creek through the tributary channel to the culvert where back flow is constricted. Flooding is exacerbated if the tributary channel is also carrying high flows.

Site 104.01 – Town of Alexander, Residences in Floodplain along Genesee and Maplewood Avenue

Tonawanda Creek meanders actively in this vicinity, coming within 80 feet of the west side of Genesee Street. Three small tributaries flow into the main channel of Tonawanda Creek in the reach beginning one half mile south of Stroh Road. The northernmost tributary flows into the Tonawanda through a culvert that passes under both a set of roads and a set of railroad tracks for over 150 feet. The elevation of the site is approximately 950 feet above sea level. The whole area to the east of Maplewood St. is sloped and drains directly to the point where the culvert goes under the streets and railroad.

Mapped soil types include: Genesee silt loam, Eel silt loam, Rhinebeck silt loam, Shallow Muck, Palmyra gravelly loam (0-3% and 3-8% slopes), Phelps gravelly loam (0-3% slopes), Wayland silt loam, Galen very fine sandy loams (0-2% slopes), and Sloan silt loam. The Wayland, Eel, shallow muck and Rhinebeck soils generally have a prolonged high water table. Marshland is shown on the topographic maps of this area..

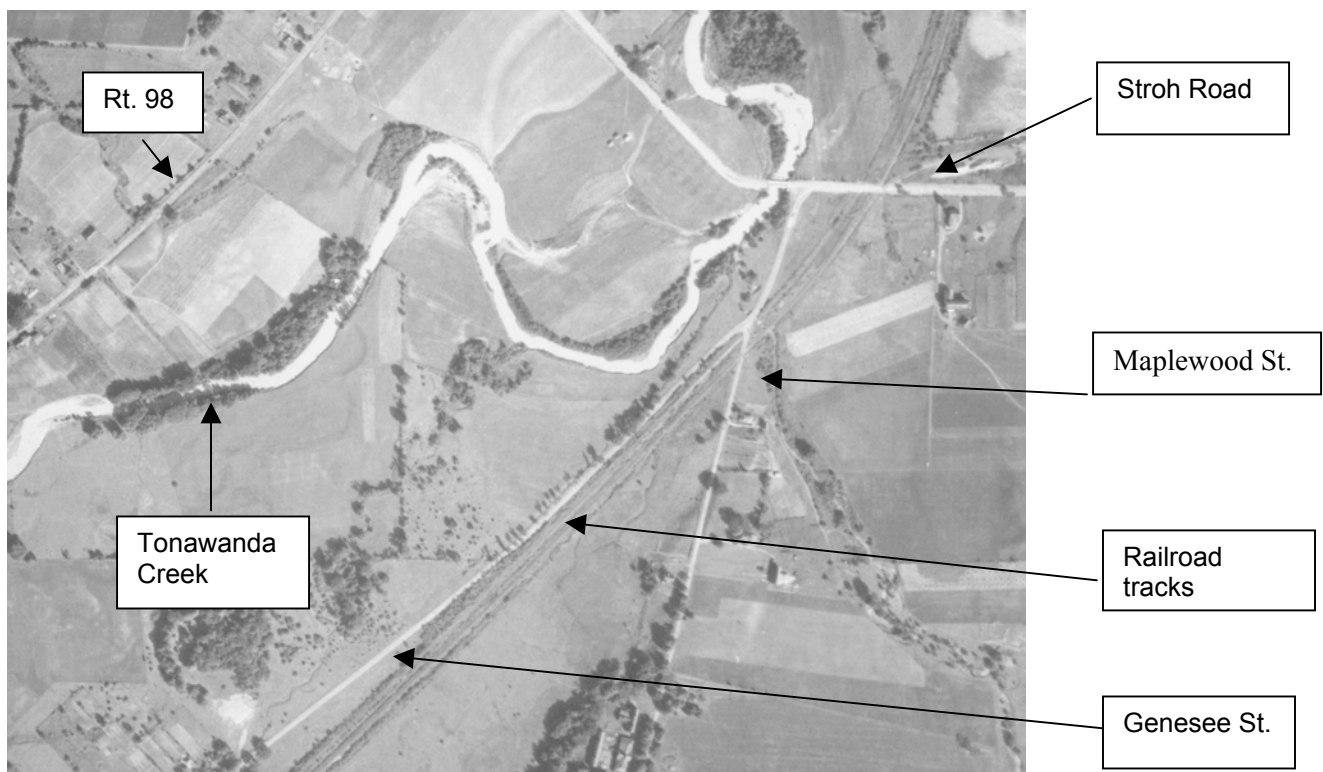


Figure 4.3a. Maplewood and Genesee Streets, Town of Alexander, 1938

In 1938, three homes are located within 1000 feet of the culvert under Maplewood Street. After the tributary passes under the railroad tracks, it then passes under a side street and then the intersection on Maplewood and Genesee St before joining the Tonawanda. The confluence is approximately 540 feet south of the bridge on Stroh Road.



Figure 4.3b. Maplewood and Genesee Streets, Town of Alexander, 1954

In 1954 there are still only 3 houses within 1000 feet south of the Maplewood St. culvert. Several small drainage ditches are located in the field in between Genesee and Maplewood St. From 1954 to 2002, the number of houses within 1000 feet of the Maplewood Street culvert does not change.



Figure 4.3c. Maplewood and Genesee Streets, Town of Alexander, 1968

In 1968 the field between Genesee Street and Maplewood Street has been drained by constructing ditches around the field and creating a straight drainage ditch from Genesee Street into the Tonawanda.

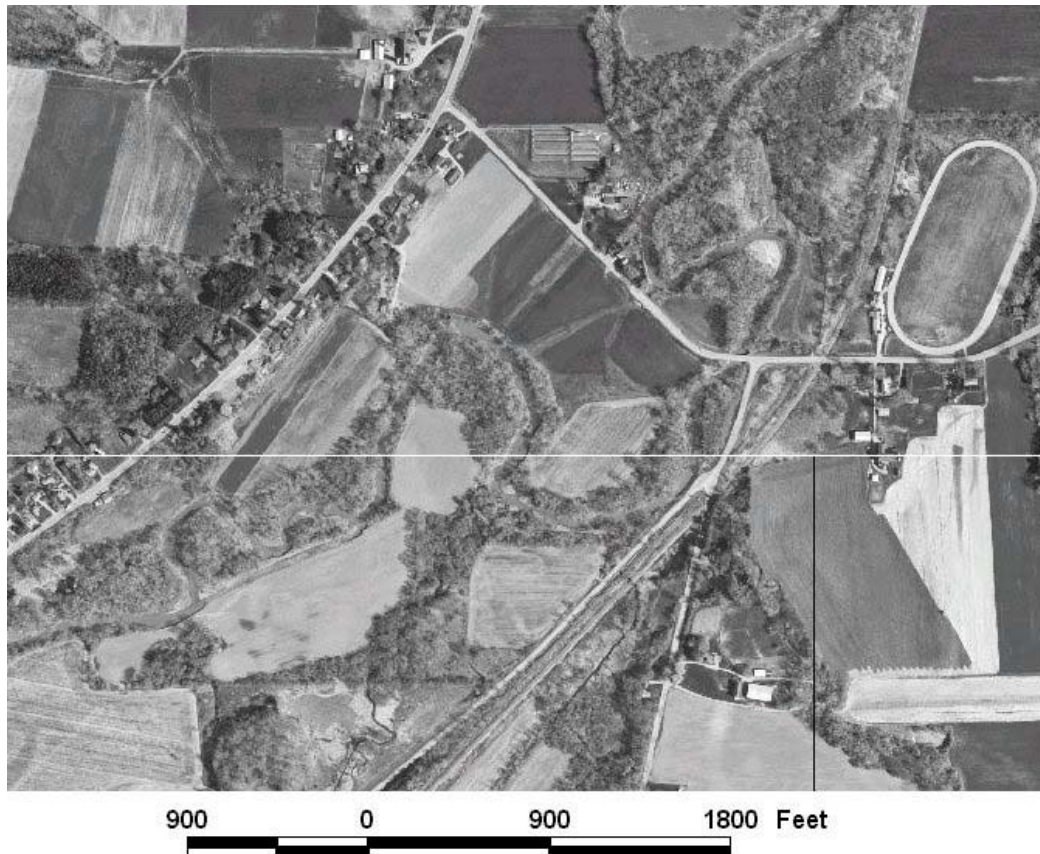


Figure 4.3d. Maplewood and Genesee Streets, Town of Alexander, 2002

By 2002, the drainage ditch in the field by Genesee Street shows new meanders, indicating that it has not been maintained.

This site floods because overbank flow from Tonawanda Creek is confined by the railroad track that runs parallel with Genesee Street south of Stroh Road. The track acts as a dam because it is approximately 4-6 feet higher in elevation than the surrounding landscape. Water flowing into Tonawanda Creek from eastern tributaries floods low-lying lands on the east side of the tracks because culverts are clogged with debris. Water backs up in the channels and overflows. When Tonawanda Creek floods, backwater flooding from the creek and clogged culverts under the railroad track appear to cause more flooding in this area. Site observation showed that these tracks appear to be little used.

The limit of the 100 year flood plain is mapped west of the intersection of Maplewood and Genesee Streets. The base flood elevation shown on the FIRM is between 945 and 946 feet. Judging from the topographic maps, portions of the area along the tributary channel could be below the base flood elevation.

Site 112.01 – West End Trailer Park – Route 5, Town of Batavia

This site is a mobile home park located approximately one quarter mile west of the Batavia City Line on the south side of Route 5. The 2002 air photo of the site shows approximately 20 mobile homes located in this facility.

Interviewees reported that residents must be evacuated from this mobile home park during every flood event. The park is reportedly served by an on-site septic system. The leach field for the septic system has been damaged by flooding several times.

The park is shown within the 100 year flood plain of Tonawanda Creek. The ground surface elevation at this site is between 880 and 890 feet. The base flood elevation is approximately 884 feet. The land surface slopes gradually toward Tonawanda Creek.

Mapped soil types include Niagara silt loam, Rhinebeck silt loam, Genesee silt loam, Wayland silt loam and Eel silt loam. The Niagara and Rhinebeck soils are both somewhat poorly drained soils with potential hydric inclusions. These soils are typically found on the edges of flood plains, typically just above areas that are frequently flooded. Eel soils are frequently flooded, moderately well drained and somewhat poorly drained alluvial soils found adjacent to stream channels. Genesee soils are well drained, frequently flooded alluvial soils found on higher embankments adjacent to stream channels. Wayland silt loam soils are poorly drained alluvial soils found in or immediately adjacent to stream channels. In an undrained condition, these soils are typically saturated to the surface or inundated. All of these soils are either unstable or highly erodible, indicating that the stream banks adjacent to Tonawanda Creek are very unstable and subject to undercutting.

A single farmhouse is located near the present-day driveway entrance to the West End Trailer Park in the 1938 photo. No mobile homes are located on the site in 1938. The site is used as pasture land. The channel of Tonawanda Creek is vegetated with a thin line of deciduous trees and shrubs (<50 feet thick). This photo is not included due to poor photo quality.

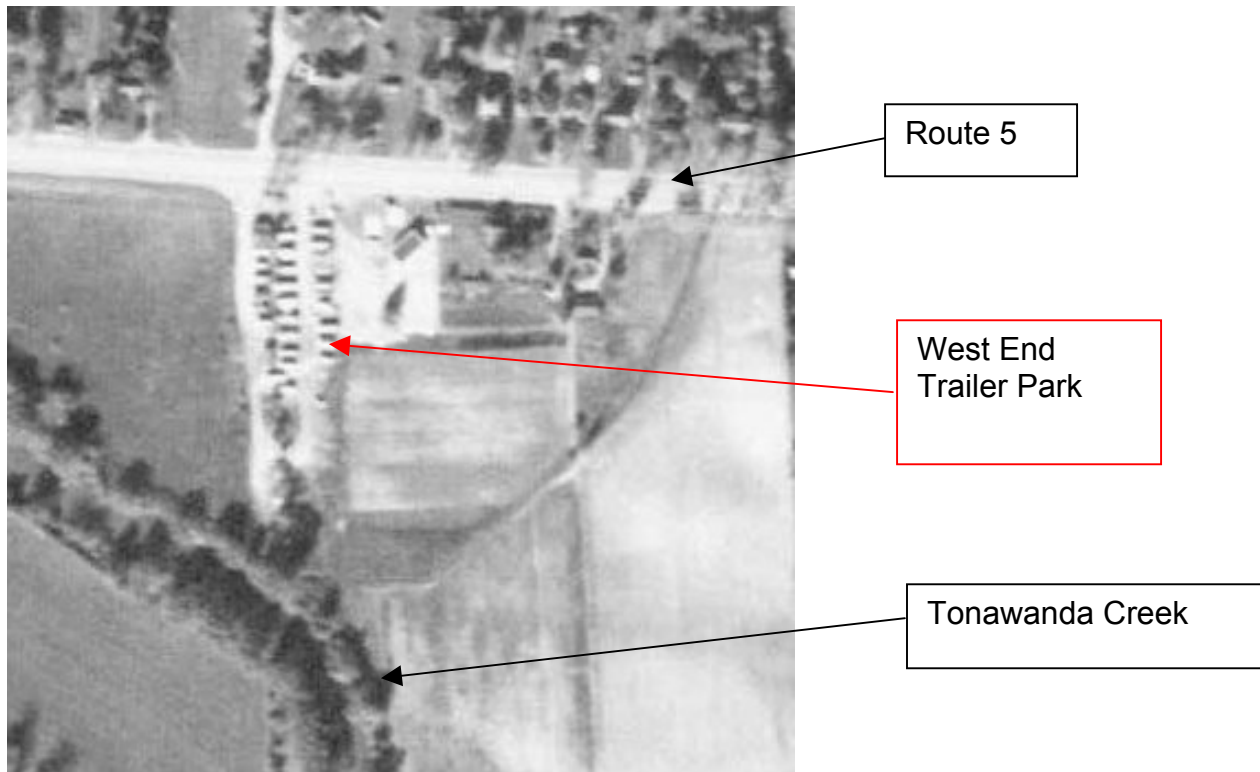


Figure 4.4a. West End Trailer Park, Town of Batavia, 1954

The 1954 air photo shows approximately 20 mobile homes located at this site. Tonawanda Creek is located approximately 290 feet from the nearest mobile home. The channel is tree-lined.



Figure 4.4b. West End Trailer Park, Town of Batavia, 1963

The 1963 photo shows approximately 15-20 mobile homes on the site. The channel is lined with mature deciduous trees. The closest mobile home is approximately 230 feet from the channel top of bank.

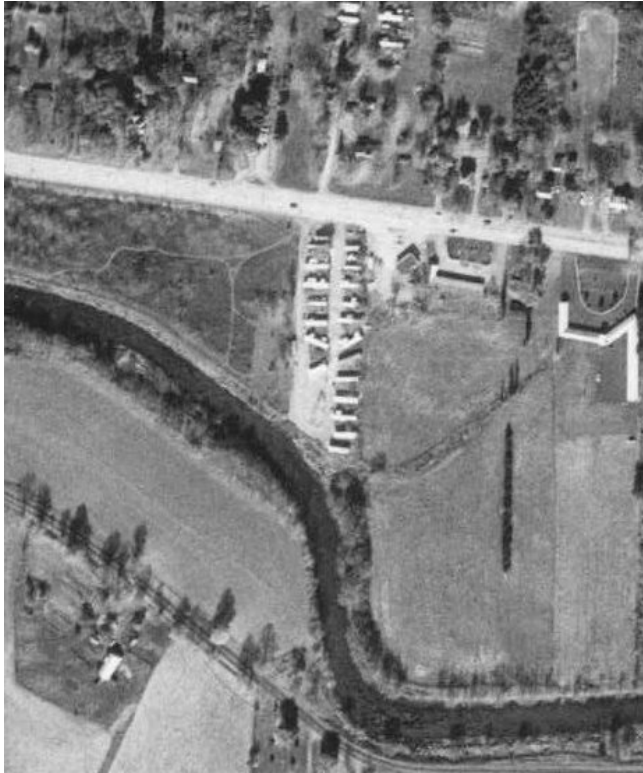


Figure 4.3c. West End Trailer Park, Town of Batavia, 1974

A 1974 photo shows 21 mobile homes on the site. Deciduous woody vegetation has been removed from the north bank of Tonawanda Creek for at least 500 feet west of the site. Some woody vegetation remains on the north bank east of the site, but much of the vegetation visible in the 1963 photo has been removed. The nearest mobile home is located approximately 90 feet from the northern top of bank on Tonawanda Creek. It appears that significant channel movement has taken place since 1963.

The 1985 photo shows the closest mobile home to be approximately 50 feet from the northern top of bank of Tonawanda Creek. The channel is devoid of vegetation. The photo was not included here because the quality was not sufficient for report reproduction.

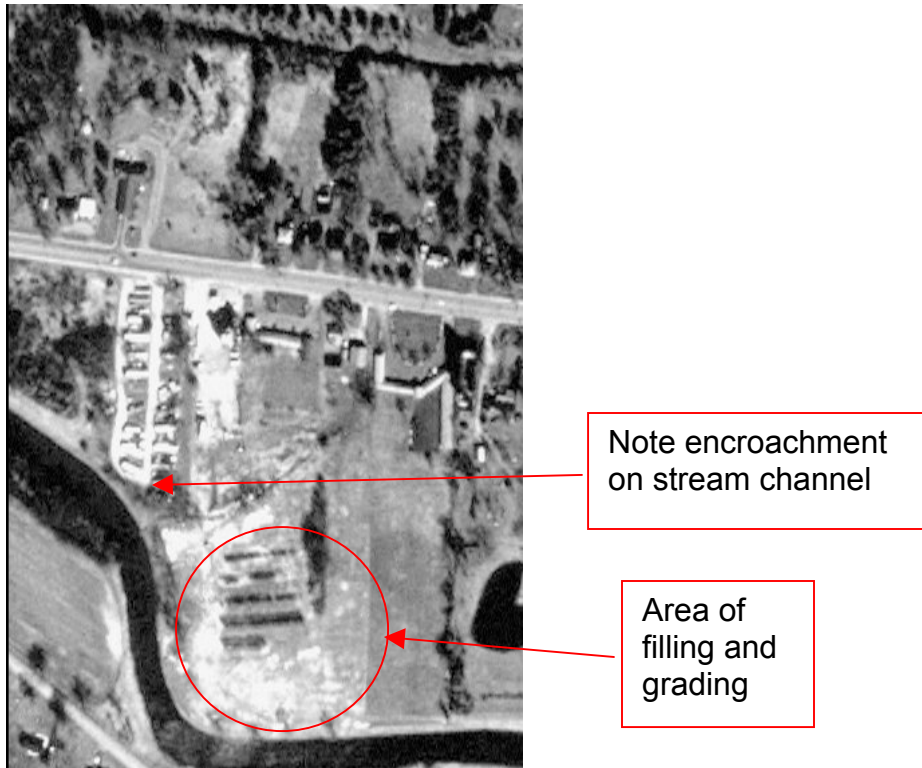


Figure 44d. West End Trailer Park, Town of Batavia, ca. 1995

A 1995 photo shows approximately 25 mobile homes in the park. The nearest mobile home is approximately 50 feet from the northern top of bank. Vegetation has been removed from the channel banks from the mobile home park east into the City of Batavia. Some filling and grading is evident on a property east of the West End Mobile Home Park Site.

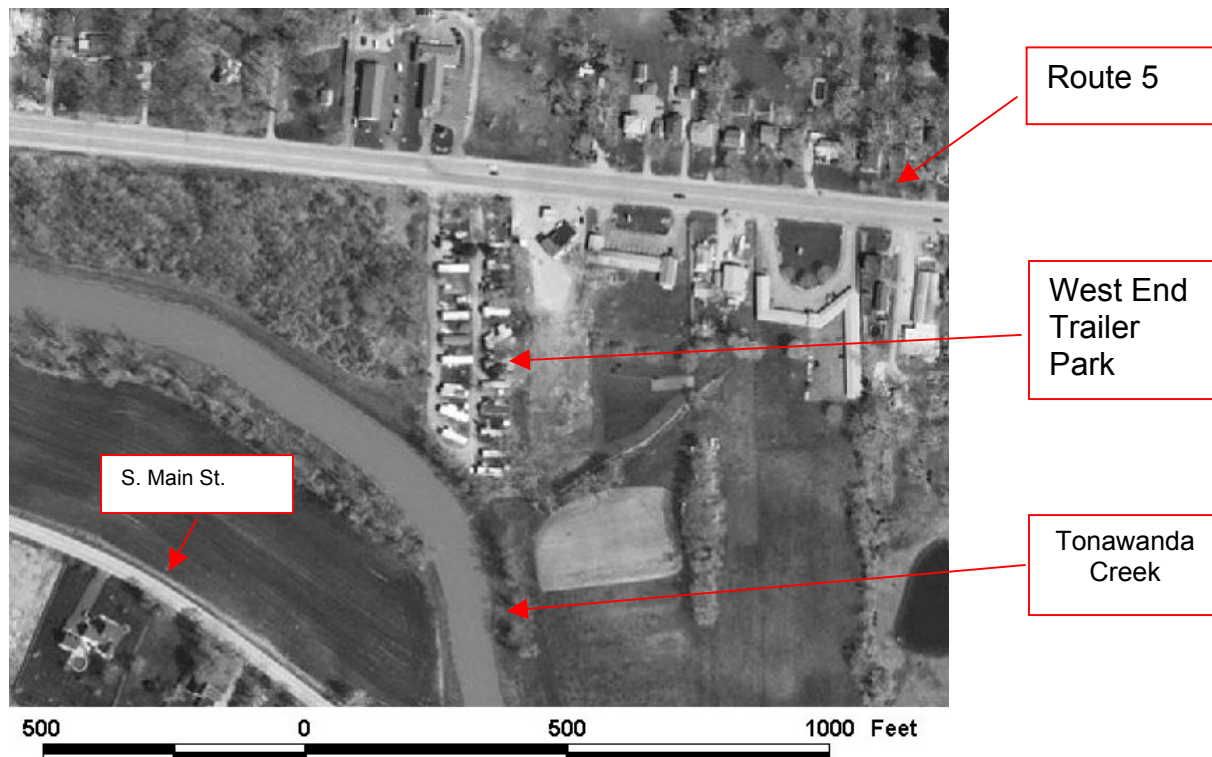


Figure 4.4e. West End Trailer Park, Town of Batavia, 2002

The 2002 air photo shows approximately 20 mobile homes in the park. The creek bank is located approximately 60 feet from the nearest mobile home.

Review of historic aerial photographs from 1938 to the present shows that this site is located within and adjacent to an active area of stream meandering. Residential structures are located below the base flood elevation at this site, and are at risk during future flood events.

Site 112.02 – Dreamland Mobile Home Park – Route 5, Town of Batavia

This site is a mobile home park located on the south side of Route 5 approximately one mile west of the Batavia City line. The issues with this residential area are similar to those described for Site 112.01. Genesee County Emergency Management and Health Department officials report that homes in this development must be evacuated during every flood event. Infrastructure such as septic system leach fields and roads sustain damage and homes may require significant repair or replacement.

The surface elevation of this site ranges between 890 and 880 feet above sea level. The land slopes gradually toward Tonawanda Creek from Route 5. The base flood elevation for this site ranges between 883 and 882 feet. Most of the site falls within or adjacent to the 100 year flood plain of Tonawanda Creek.

Soils mapped for the site include Wayland silt loam and made land (filled). Wayland silt loam soils are poorly drained, recently deposited alluvial soils that are subject to

frequent flooding. Made land is described as land that has been filled and graded. Materials used in made land may include fill soils from other sites, rocks, gravel and construction debris.

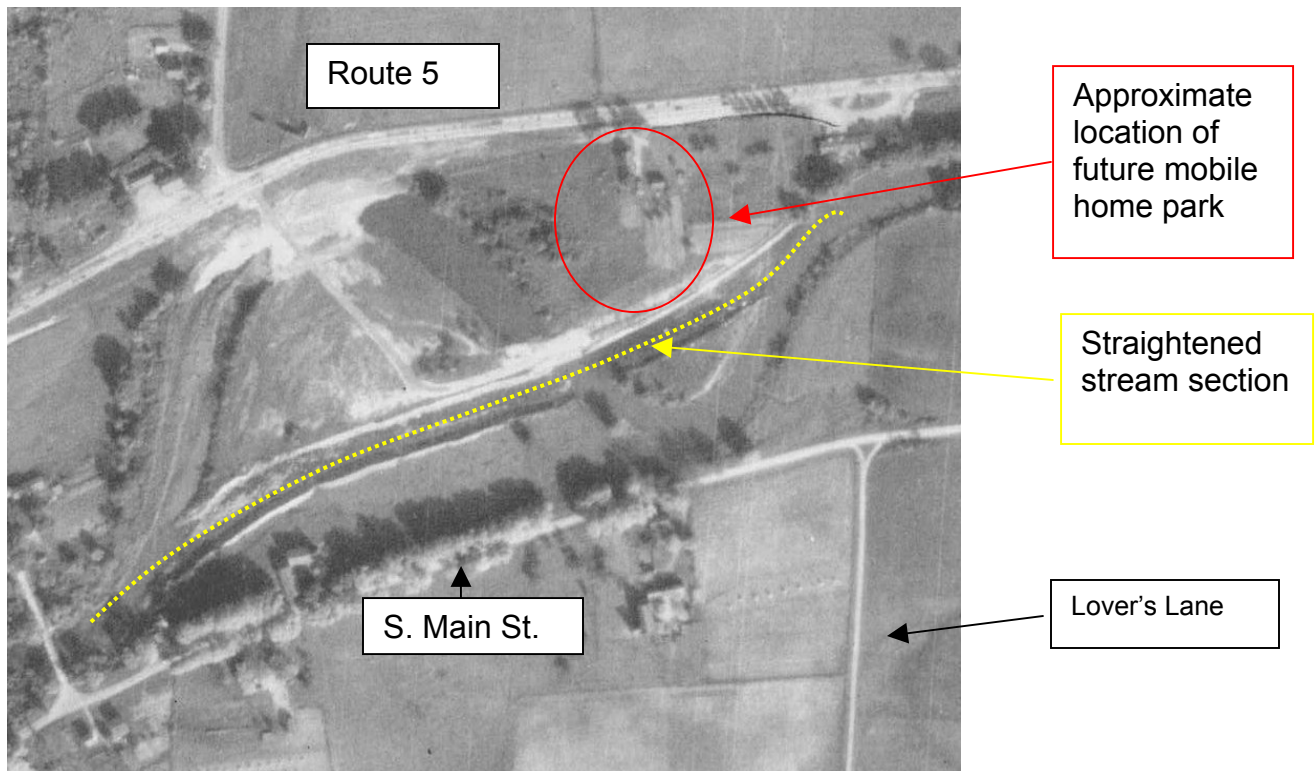


Figure 4.5a. Site of future Dreamland Mobile Home Park, Town of Batavia, 1938

The 1938 air photo shows that a stream channel meander was cut off when Tonawanda Creek was straightened near this site. Fill was placed across the northernmost point of the old meander to provide additional bank stabilization and reinforcement where NY Rt. 5 was being undercut. The Tonawanda Creek channel has no vegetation along either bank for approximately one half mile, indicating that the straightening was done within a year or two of the photograph date. The site of the mobile home park was used as a farmstead in 1938. One farm house and a barn structure are shown.

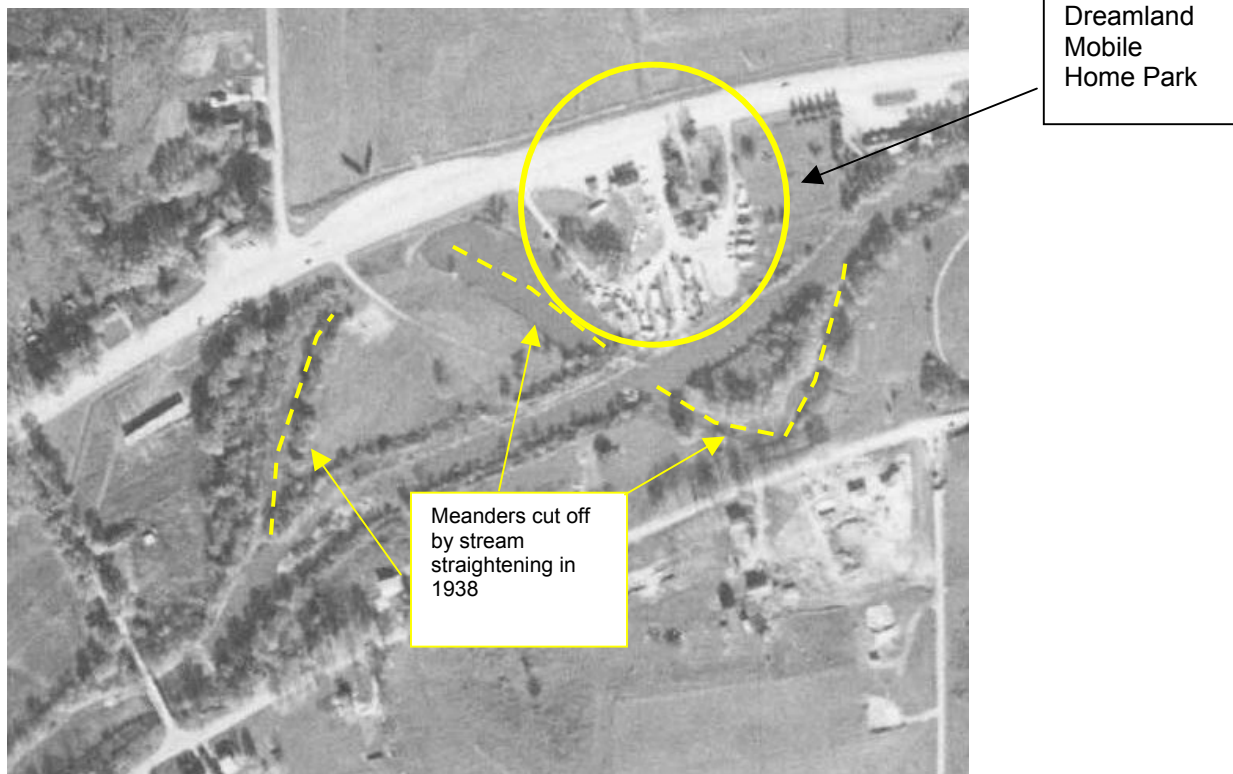


Figure 4.5b. Dreamland Mobile Home Park, Town of Batavia, 1954

The 1954 air photo shows a cul-de-sac road that serves the mobile home development. This road comes within 90 feet of the northern top of bank of Tonawanda Creek. Approximately 17 mobile homes are evident in the photo. The north bank of the creek is either mowed or unvegetated in the vicinity of the mobile home development. The south bank shows a line of young deciduous trees and shrubs. The old meander forms a pond on the west side of the mobile home development. Vegetation around this pond is mowed lawn.



Figure 4.5c. Dreamland Mobile Home Park, Town of Batavia, 1963

The 1963 air photo shows some expansion of the road system serving the development. The meander pond is still evident. Approximately 20-25 mobile homes are located on the site.



Figure 4.5d. Dreamland Mobile Home Park, Town of Batavia, 1968

The 1968 air photo shows approximately 21 mobile homes on the site. The stream configuration has not changed appreciably since the 1963 photo. The trees along the Tonawanda Creek have developed a larger canopy since 1963. Five mobile homes are located immediately adjacent to the creek bank.



Figure 4.5e. Dreamland Mobile Home Park, Town of Batavia, 1974

Twenty four mobile homes occupy this development in the 1974 photo. Six mobile homes are located within 50-60 feet of the channel top of bank. The channel bank is lined with a continuous canopy of deciduous woody vegetation.

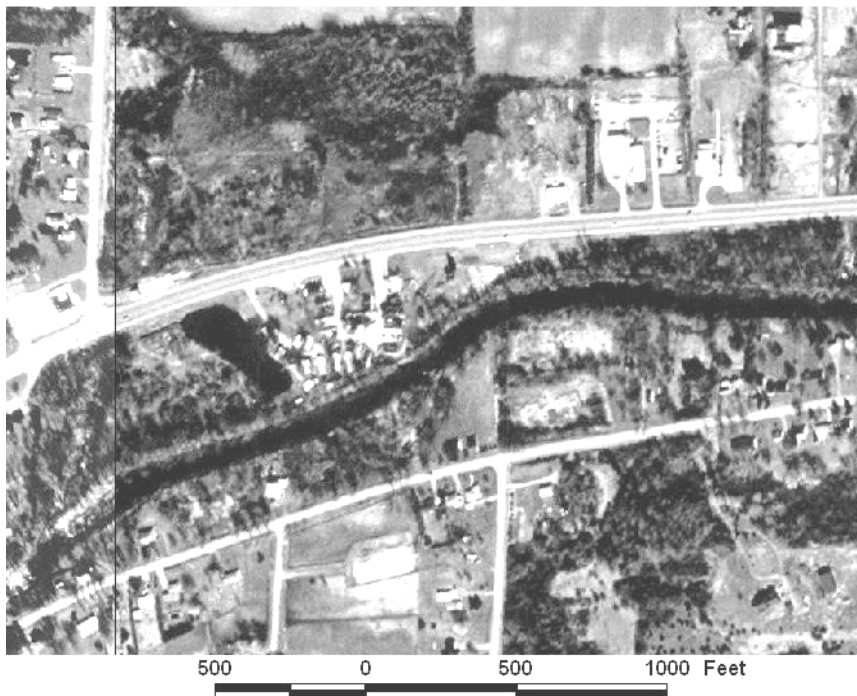


Figure 4.5f. Dreamland Mobile Home Park, Town of Batavia, 1994

Approximately twenty-one mobile homes are evident in a 1994 photo of the site. The stream channel is lined with deciduous trees on both sides. The old meander pond is still evident. Eight mobile homes are located within 100 feet of the top of bank.



Figure 4.5g. Dreamland Mobile Home Park, Town of Batavia, 2002

In a 2002 air photo, approximately fifteen mobile homes are evident. The nearest homes are approximately 60 feet from the top of the bank. Approximately 7 homes are located immediately adjacent to the creek channel.

Site 113 – Residential development along South Main Street adjacent to Tonawanda Creek, Town of Batavia

This site includes residential development on the north side of South Main Street between the Batavia City line and Wortendyke Road. The Oakfield and Batavia North NYSDOT planimetric maps show approximately 25 structures located on the north side of South Main Street. Site observation conducted in April, 2003 showed these structures to consist of single- and two-story, wood frame, single family residences, with accessory garages and outbuildings. Many of these structures appear to pre-date the National Flood Insurance Program. Several of the structures appear to be in fair to poor condition, but remain occupied.

County emergency management and health department officials report that South Main Street is often closed during flood events because most of the land is low-lying. Residents in this area must be evacuated to avoid injury or loss of life. Real estate on

South Main Street sustains damage regularly from flooding on the Tonawanda due to its low-lying topographic position and proximity to Tonawanda Creek. The area is served by public water, but individual residences rely on septic systems for sanitary waste disposal. During periods of high water, septic systems may be damaged or become unusable. County officials also installed a new water line along South Main Street from the Batavia City Line to Wortendyke Road in 2003.

Review of topographic maps of the area shows that the elevation of South Main Street ranges from a high of 893 feet at the Batavia City line to a low of 882 feet at Wortendyke Road. The 100 year flood elevation ranges from approximately 888 feet at the Batavia City line to approximately 877 feet at Wortendyke Road. The northern toe of slope for South Main Street defines the limit of the 100 year flood plain along much of this stretch of road.

Mapped soil types along this stretch of South Main Street include Eel silt loam, Arkport fine sandy loam (1-6%), Colonie loamy fine sand (2-6% and 6-12%), Galen and Minoa very fine sandy loam (0-2% slope), Galen very fine sandy loam (2-6% slope), Wayland silt loam. All of these soil types are erodible and form unstable streambanks.

Review of historic air photos dating from 1938 to 2002 show a pattern of stream channel meandering in response to flood events and stream straightening. The 1938 air photo shows that approximately 1500 feet of channel was straightened south of Kelsey Road. An additional section of channel was straightened 1.6 miles east of Kelsey Road. Remnant meanders were cut off from the main channel with fill. Parts of the old meanders were filled in. The straightened channel section closest to Kelsey Road appears to have remained stable from 1938 to the present. The other straightened section shows evidence of meandering.

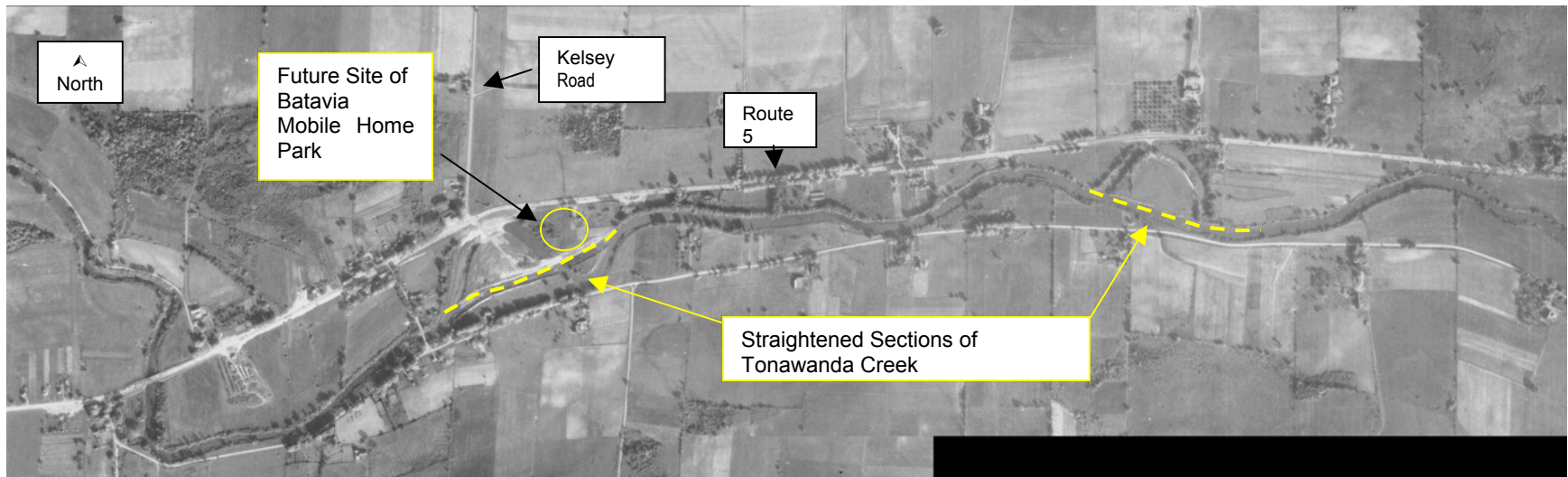


Figure 4.6a Tonawanda Creek from Wortendyke Road to just west of City of Batavia, 1938

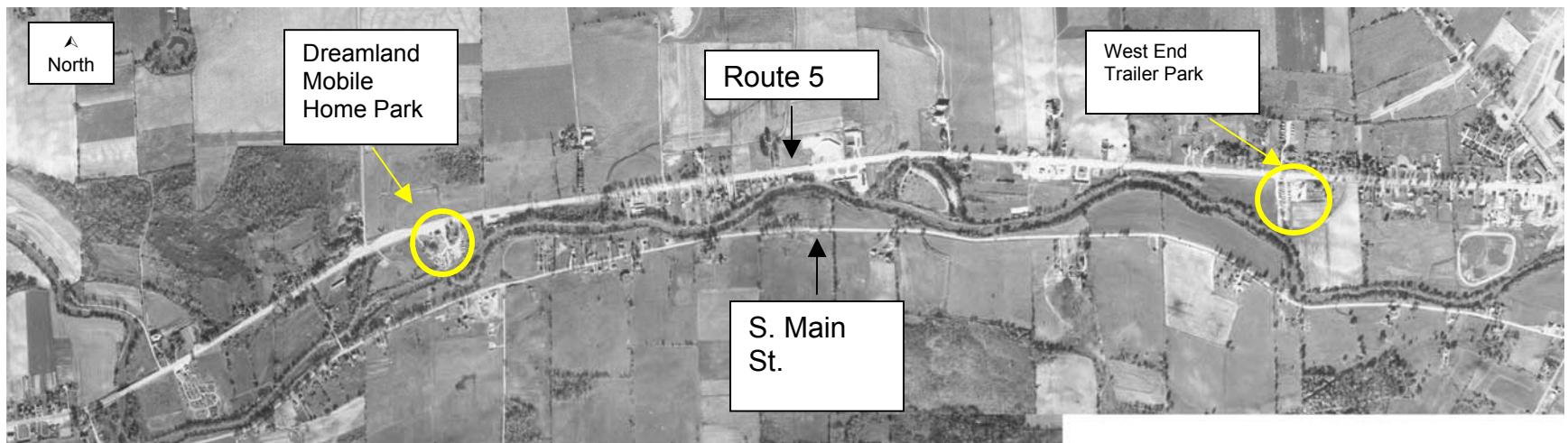


Figure 4.6b. Tonawanda Creek from Wortendyke Road to City of Batavia west line, 1954

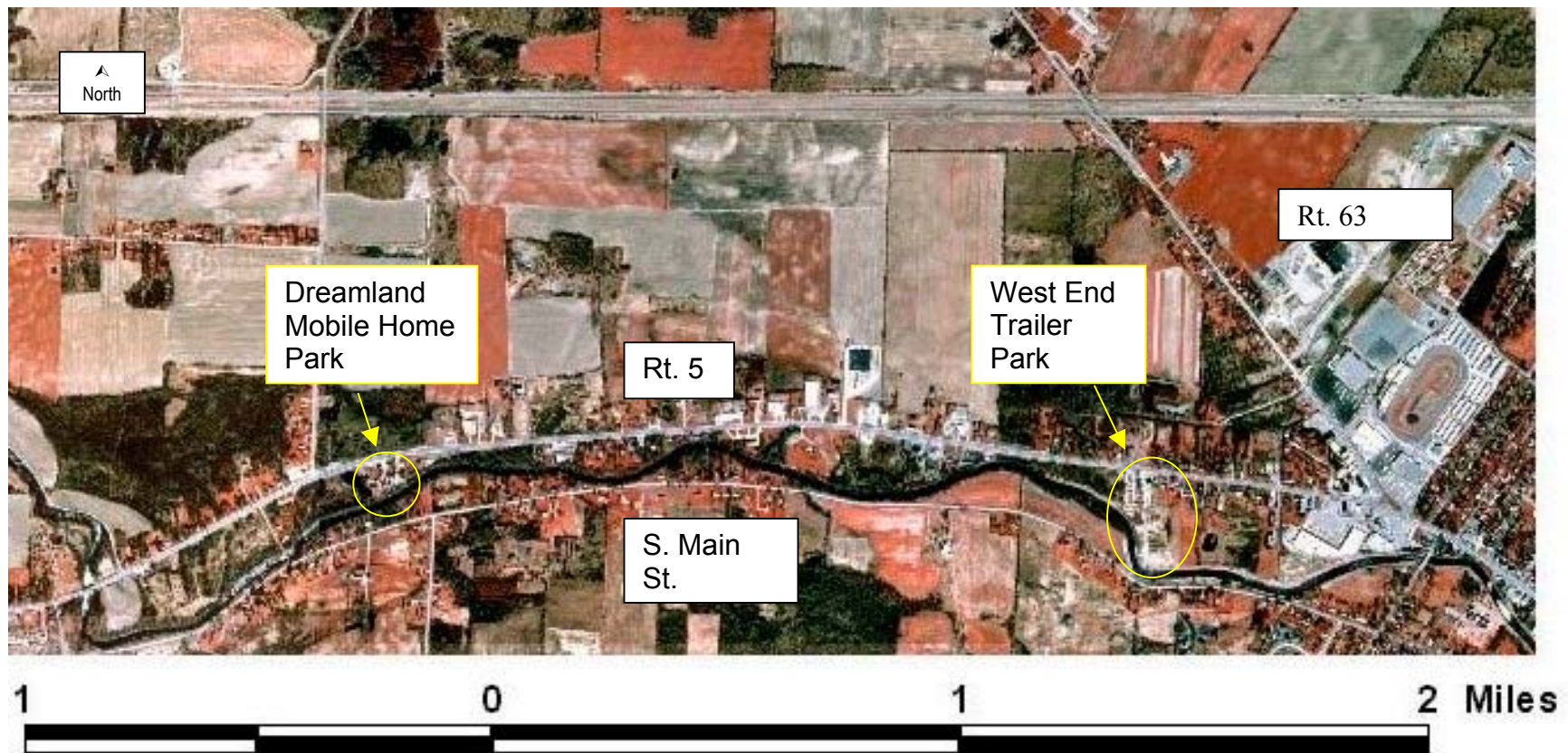


Figure 4.6c. Tonawanda Creek from Wortendyke Road to City of Batavia west line, 1994

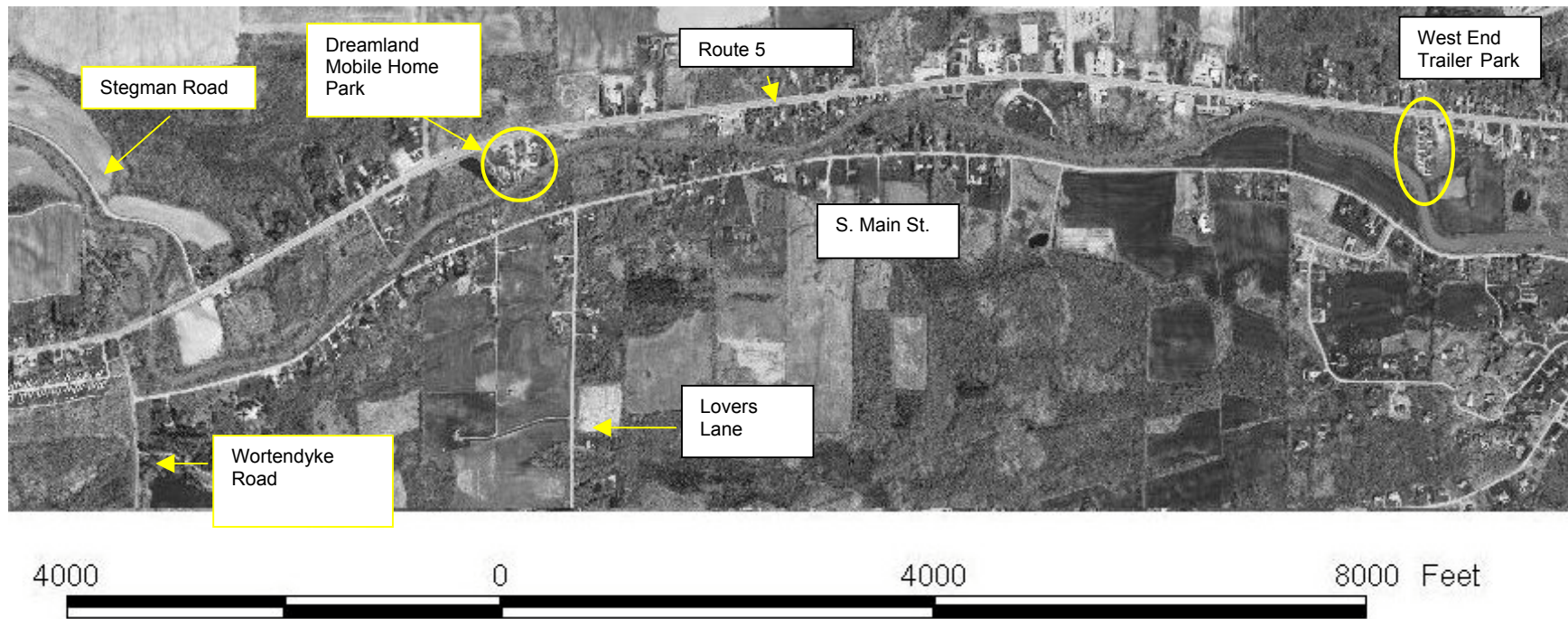


Figure 4.6d. Tonawanda Creek from Wortendyke Road to Batavia west line, 2002

Sections of the Tonawanda channel are located adjacent to South Main Street for 2200 feet west from the city line, from 4300 feet to 5100 feet west of the city line, from 1500 feet to 2200 feet east of Lovers Lane, and from Wortendyke Road to Mill Road (approximately 2400 feet). These sections appear to be the most flood-prone sections of South Main Street.

Site 109 – City of Batavia Water Treatment Plant

The City of Batavia Water Treatment Plant has been identified as a critical facility for maintaining adequate potable water to the City and Town of Batavia, the Village and Town of Oakfield, and in some circumstances, the Town of LeRoy, the Village of LeRoy and other areas. The City's Water Treatment Plant supplies most of the potable water needs of the community. The City and County also have several connections with the Monroe County Water Authority system. These connections, the piping, storage and pumping facilities are needed to supply them are currently being upgraded under a long-term agreement between Monroe County and Genesee County. It is anticipated that the City of Batavia Water Treatment Plant will remain a critical facility for the foreseeable future.

At the present time, the interconnections between the Genesee County (Batavia) system and the Monroe County system do not have sufficient capacity to supply all the needs of the City and Town of Batavia and the surrounding regions. Therefore, it is essential to maintain operations at the Batavia Water Treatment Plant.

The Batavia system includes a raw water intake on Tonawanda Creek, as well as two wells on Cedar Street. The Batavia Water Treatment Plant is located approximately 325 feet east of the east bank of Tonawanda Creek between the CSX and the bed of the former Lehigh Valley Railroad. The ground elevation at the water treatment plant is approximately 898 feet. The 100 year flood plain elevation is approximately 895 feet in the vicinity of the water treatment plant.

The channel of Tonawanda Creek changes directions about 200 feet south of the water treatment plant building, and again about 1000 feet north of the water treatment building. These two sharp bends experience ice jamming even under normal flow conditions during the late winter and early spring. Coupled with high flow conditions, ice jamming has produced significant flooding in this part of Batavia. City officials said they have used dynamite to break ice jams at Kibbe Park to protect the City's water treatment plant and other infrastructure.

The City water treatment plant has at least one operator on duty at all times. The City's position is that it would not be necessary to get a vehicle into the plant on an emergency basis in the event of a flood, because an operator would already be on duty. They also stated that most of the City's water comes from groundwater wells that would not be

affected by normal flood events. They also noted that the City keeps at least a day's supply of water in its storage facilities located throughout the service area.

Although the plant did not sustain damage in flood events during 1968 or 1998, county officials believe that this facility should be better protected during flood events. Access to the site is severely restricted by the presence of a railroad overpass. The overpass is subject to flooding and may present an obstacle to emergency vehicles during an extreme flood event. The raw water intake on Tonawanda Creek is also subject to flooding, and requires protection during flood events.

Review of historic aerial photographs from 1938 to 2002 indicated the following:

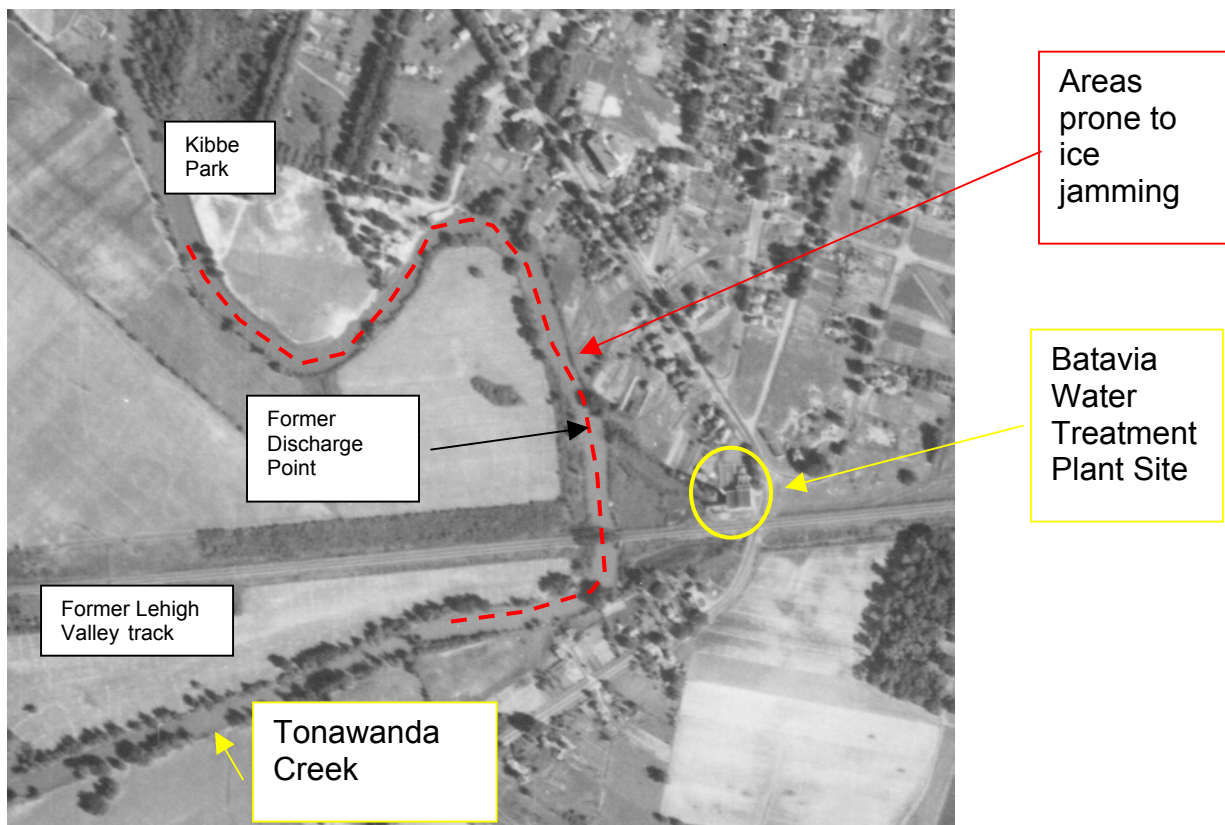


Figure 4.7a. Batavia Water Treatment Plant Site, 1938

1938 – The water treatment plant is in place. An outfall or discharge point for the facility is located approximately 450 feet north of a set of railroad tracks. A few trees line the channel of Tonawanda Creek. City development is encroaching on the plant from the east. Kibbe Park appears to be under development. A baseball diamond is evident in the photo at Kibbe Park. The remainder of land use is farm land around the treatment plant.

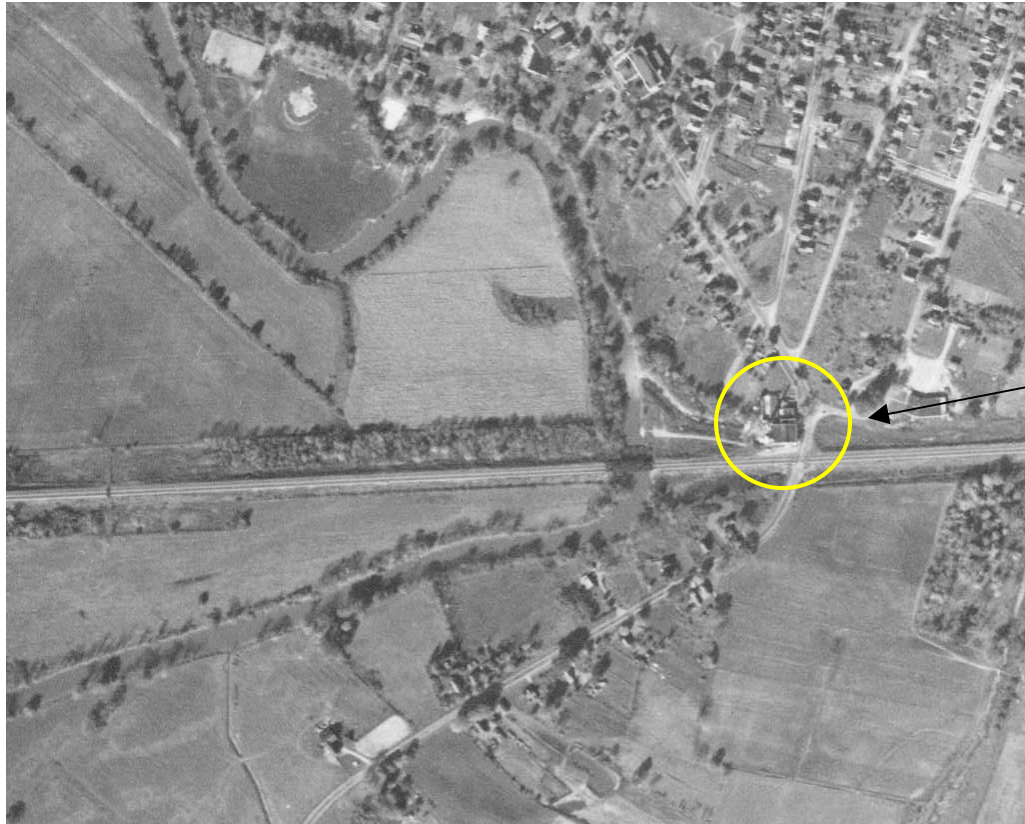


Figure 4.7b. Batavia Water Treatment Plant, 1954

1954 – The treatment plant outfall and building are in the same location as in 1938. The stream channel has a thin line of trees on either side. The channel is farmed almost up to the top of bank in most locations. City development continues to encroach into the flood plain.

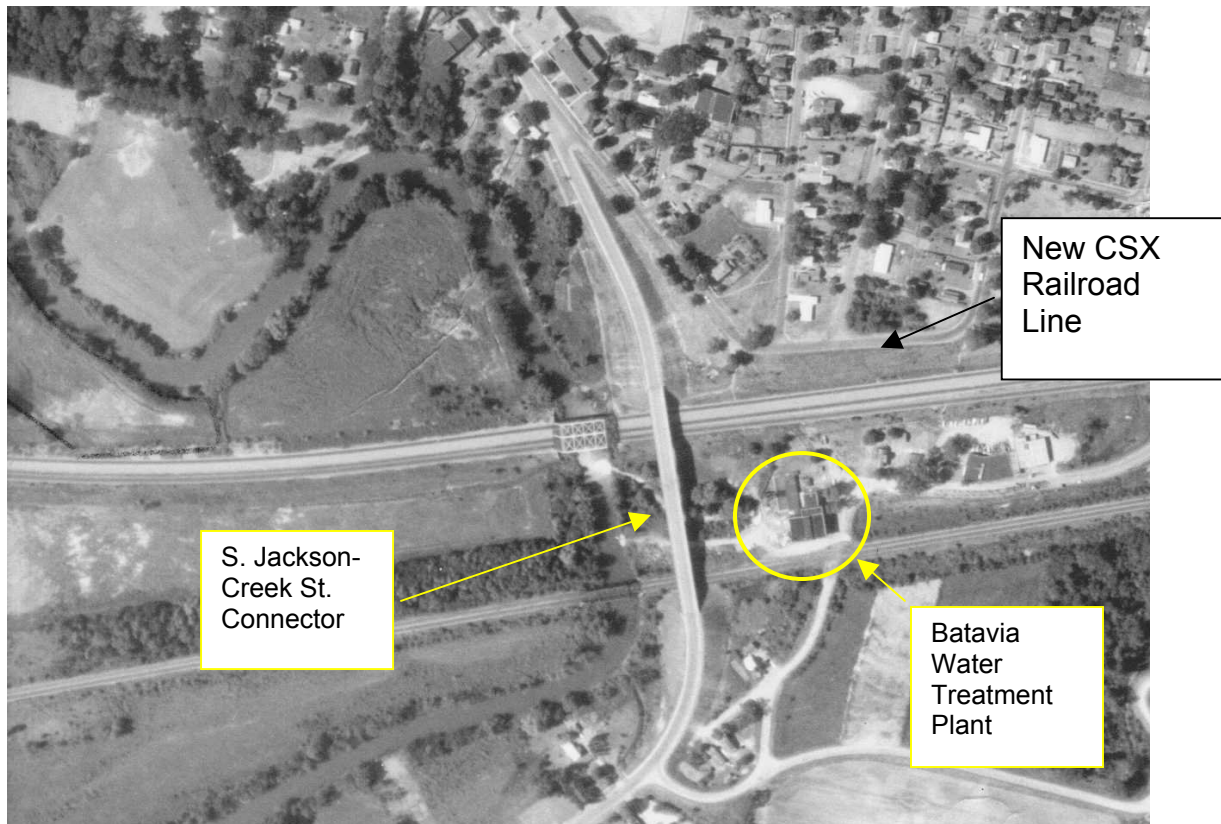


Figure 4.7c. Batavia Water Treatment Plant Site, 1963

1963 – An overpass connecting Creek Street and Jackson Street has been constructed over two east-west railroad lines. A new railroad line has been constructed approximately 500 feet north of the plant site. Both lines appear to be active. Farming has been abandoned on marginal, flood-prone lands between the tracks. Some filling is evident adjacent to the tracks north of the plant. The meander pattern adjacent to the treatment plant appears to be stable.



Figure 4.7d. Batavia Water Treatment Plant, 1974

1974 – Some filling is evident on the east bank of Tonawanda Creek approximately 400 feet north of the north railroad track. The plant outfall appears to be in the same location. Plant access appears to be via an underpass under the CSX tracks or an at-grade crossing off Creek Street from the south.



Figure 4.7e. Batavia Water Treatment Plant, 1985

1985 – Plant site appears to consist of four buildings. The outfall previously evident appears to have been eliminated. The overpass road (Creek Street) is still present. Access to the site is via an at-grade crossing off of Creek Street over the southern railroad track. The southern track appears to be unused.



Figure 4.7f. Batavia Water Treatment Plant, 2002

2002 – The overpass road first described in the 1963 photo has been removed. The bridge over Tonawanda Creek for the southern railroad track has been removed. The outfall appears to have been eliminated.

Site 515 – Village of LeRoy Sewage Treatment Plant

The Village of LeRoy Sewage Treatment Plant is located adjacent to the main channel of Oatka Creek approximately one mile downstream from the Rt. 5 bridge. The surface elevation at the plant site ranges from 820 to 810 feet. The ground surface slopes easterly toward Oatka Creek on a slope of approximately 5%. The mapped soil types at the plant site include Ontario loam (0-3% slope and 3-8% slope), Colonie loamy fine sand (1-6% slope), and Genesee silt loam. The Ontario and Colonie soils are found on the higher portions of the site. The Genesee silt loam is found on the alluvial floodplain portion of the site.

The Flood Insurance Rate Map (Panel No. 360281-0001B, August 1981) for the Village of LeRoy does not include the sewage treatment plant site. The Town of LeRoy Flood Insurance Rate Map (Panel No. 360280-002B, September, 1979) also omits this area because it is shown inside the Village limit. The corporate limits on the two maps do not match. Neither map has defined base flood elevations shown. Therefore, the base flood elevation is not well defined at this location.

Interviews with County and local representatives indicate that the plant is in a flood-prone area. The clarifier has been flooded in the past. The plant is a critical facility for the Village because it provides an essential service, and has no back-up facility in the event of flooding. County officials have recommended upgrades for the plant.

The former Village Public Works Director thinks that flooding at the sewage treatment plant is likely to occur more frequently since the northwest sector of the Village has been developed. The northwest quadrant of the Village was largely undeveloped until the mid-1980's. Since that time, the area has developed with a number of "big box" developments with large paved parking areas. Detention basins that were designed to provide temporary storage of storm water runoff are now full of water year around because they were constructed in high water table soils. A regional stormwater retention facility was proposed to serve the Copart development and other sites. This retention facility has not been constructed as of July 2003. Without these stormwater retention facilities, the Village sewage treatment plant is at a greater risk for flood damage because the tributary receiving discharge from this area forms a confluence north of the plant site.

Review of historic aerial photographs from 1938 to 2002 shows the following pattern of development. The 1938 air photo shows several buildings at the end of the driveway serving the plant site, but no clear definition of a sewage treatment plant in operation. The driveway serving the site is in place, but the plant site is in a wooded meander channel. The 1954 photo shows a similar situation to the 1938 photo. No development is shown in the present day plant site. The site is occupied by a wooded floodplain area.

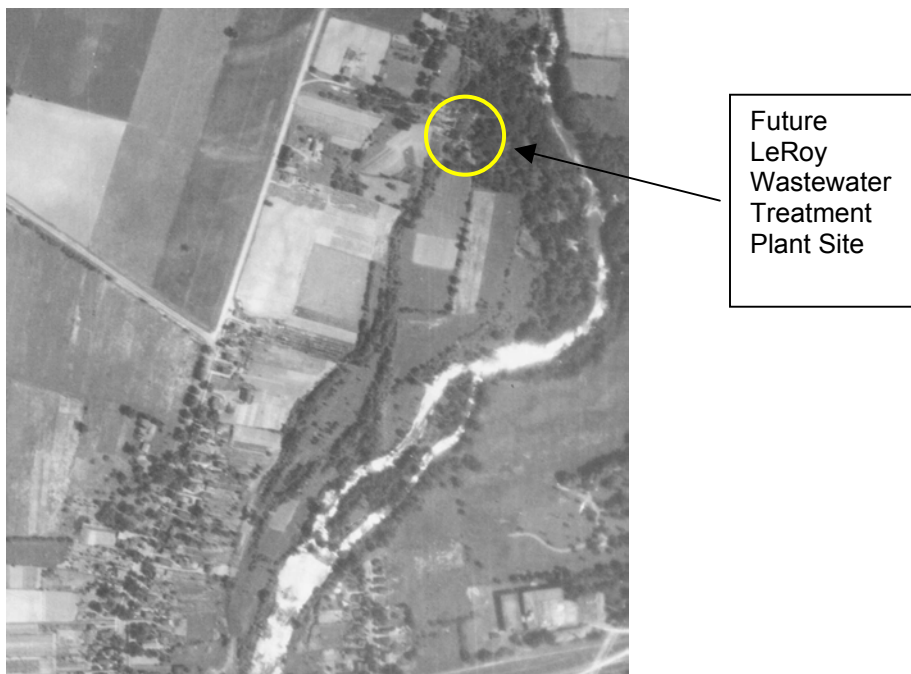


Figure 4.8a. Future LeRoy Village Wastewater Treatment Plant Site, 1938

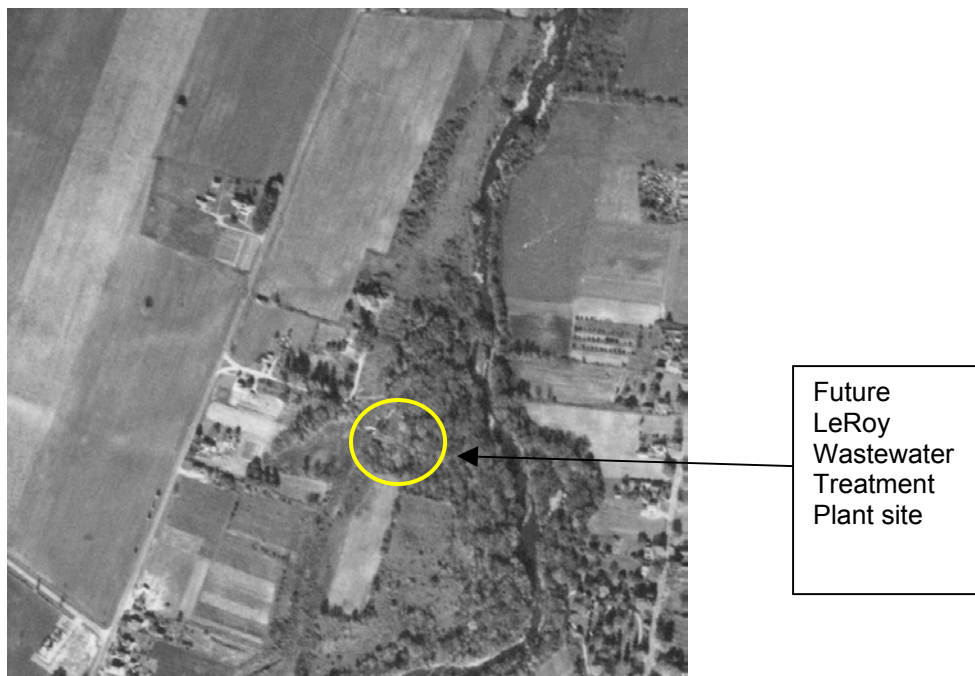


Figure 4.8b. Future Village of LeRoy Wastewater Treatment Plant Site, 1954

The first photograph showing the treatment plant in its present day location is from 1963. The digester is located approximately 933 feet east of Rt. 19 and 300 feet west of the west bank of Oatka Creek. A sixty-foot wide strip of deciduous trees buffers the channel bank from the developed area of the site. The water level in Oatka Creek is low in the photo. Several sand or gravel bars are evident. Several small rapids are evident immediately upstream from this site, indicating the presence of shallow bedrock.

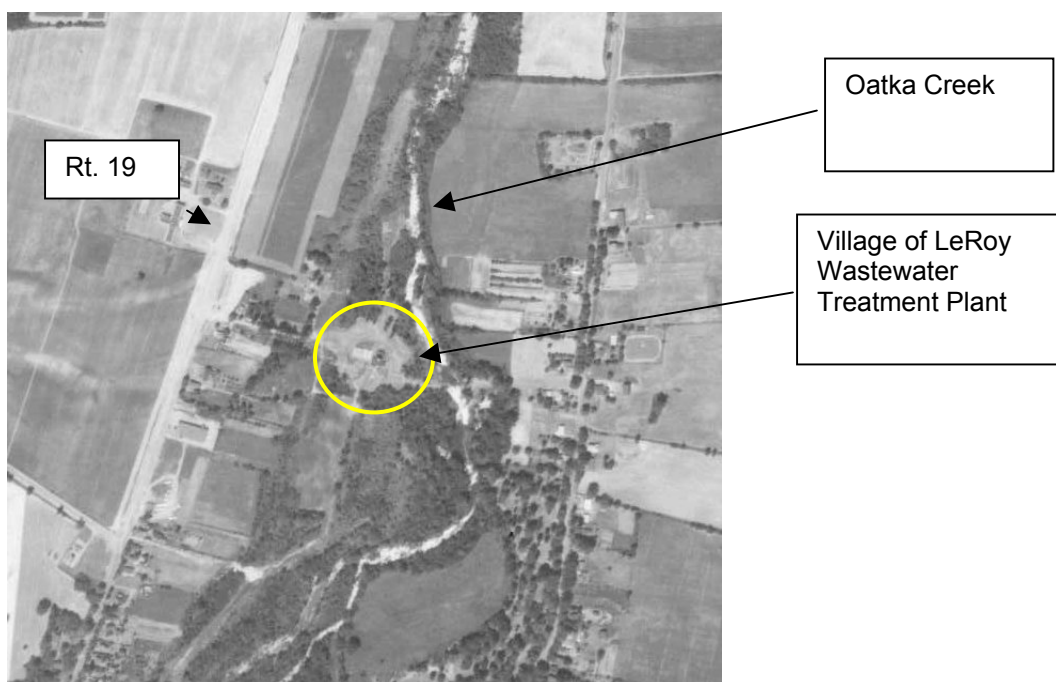


Figure 4.8c. Village of LeRoy Wastewater Treatment Plant, 1963



Village of
LeRoy
Wastewater
Treatment
Plant

Figure 4.8d. Village of LeRoy Wastewater Treatment Plant, 1968

The 1968 photograph of the site shows an additional digester or clarifier (round structure), and a new building. Trees have been removed on the plant site down to the stream bank. A few trees remain, but not a solid canopy as in earlier photographs.



Village of
LeRoy
Wastewater
Treatment
Plant

Figure 4.8e. Village of LeRoy Wastewater Treatment Plant, 1974

The 1974 photograph of the site shows the same building configuration as the 1968 photo. More trees have grown up along the stream banks, providing more canopy cover.

The digester buildings are approximately 250-300 feet from the west bank of the creek.

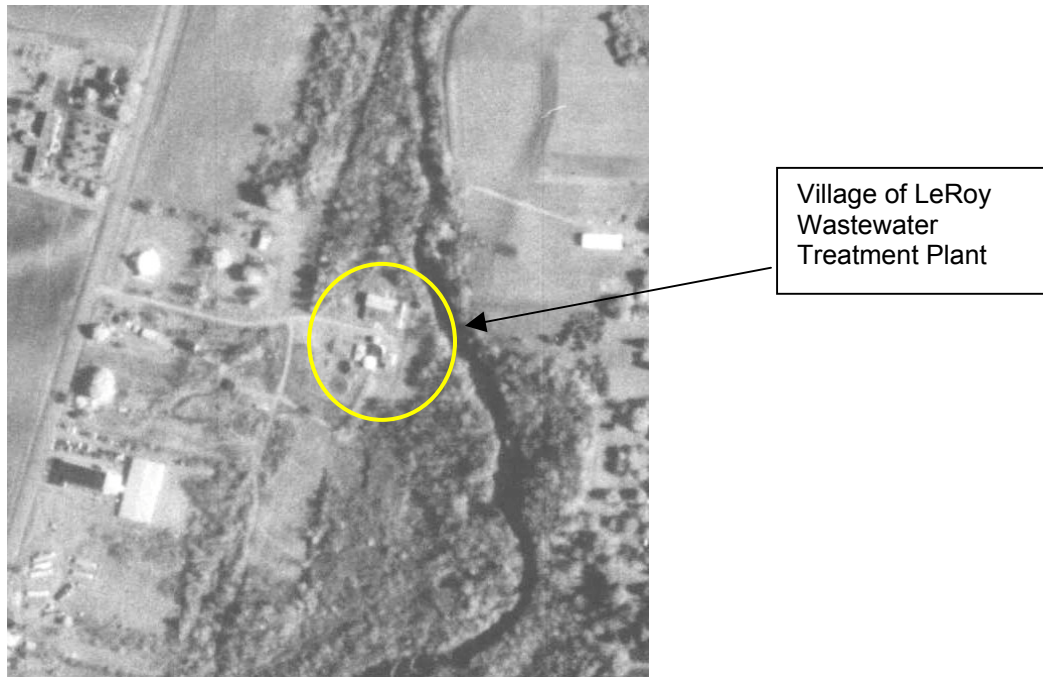


Figure 4.8f. Village of LeRoy Wastewater Treatment Plant, 1985

The 1985 photograph shows a new building north of the existing buildings on the site. This building is located approximately 110 feet from the western side of Oatka Creek. The stream channel appears to be in the same location relative to the location of the original digester on the site. The site may have 2 new aerators or clarifiers added. The photo is not clear enough to discern the function of the structure.

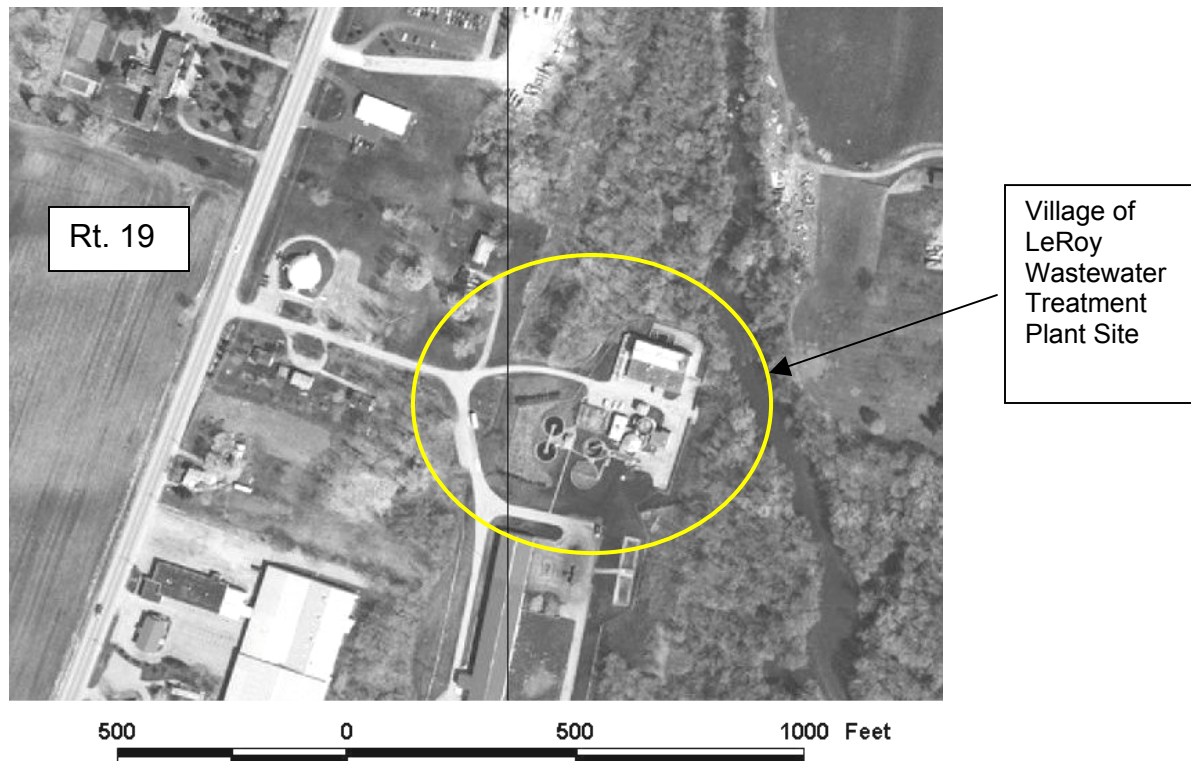


Figure 4.8g. Village of LeRoy Wastewater Treatment Plant, 2002

The 2002 photograph is similar to the 1985 photo. Buildings are in the same relative locations to the stream channel.

Site 517 – Village and Town of LeRoy – Development in Northwest sector of Village and adjacent areas of Town

This site is a 640+ acre site, bounded by Keeney Road on the west, Rt. 5 on the south, Quinlan and West Bergen (a.k.a. Gillette) Road on the north, and Rt. 19 on the east. It includes the northwest corner of the Village of LeRoy and adjacent portions of the Town of LeRoy.

Key physiographic features of the site include an unnamed tributary of Oatka Creek and that originates south of Rt. 5, west of Gilbert Street, several unnamed drainage ditches, and three railroad tracks, the former New York Central Line (northernmost line), an inactive CSX line, and the active Rochester & Southern Railroad line (former Baltimore & Ohio line). Surface elevations on the site range from 896 feet at the intersection of Rt. 5 and Keeney Road, to 881 feet at the intersection Keeney Road and Quinlan Road, to a low point of approximately 850 feet where the tributary passes under West Bergen Road.

The unnamed tributary of Oatka Creek flows under Rt. 5 approximately 1200 feet west of the intersection of the Rochester and Southern Railroad tracks and Rt. 5. The stream is piped through the Rite-Aid property south of Rt. 5, and emerges on the west side of the Tops Property. From this point the tributary flows northeasterly through a series of

railroad culverts, ditched and natural channel areas and wooded wetlands, forming a confluence with Oatka Creek north of the Village Wastewater Treatment Plant.

Mapped soil types for this area include the well drained Ontario and Arkport soils, moderately well drained Lima, and Hilton soils, somewhat poorly drained Appleton and Lyons-Kendaia soils and significant amounts of poorly and very poorly drained muck soils and Lamson sandy loam. No alluvial soils are mapped for this area, indicating that it is not subject to flooding from Oatka Creek. However, much of the area is low-lying and has poor drainage. Natural drainage from the site is controlled by culverts under the three railroads. These drainage culverts are silted up or clogged with vegetation due to poor maintenance by the railroads.

Flooding on this site has resulted from the placement of large areas of impervious surface (parking lots, big box buildings) in low-lying areas without adequate stormwater detention. The problem has been exacerbated by the lack of maintenance on existing railroad culverts and adjacent drainage ditches. Residents have reported flooding on the Rite-Aid and Tops properties when drainage facilities are surcharged. The Soil and Water Conservation District Office noted that the Tops Market stormwater detention pond was constructed in an area mapped as Canandaigua soil, a very poorly drained soil. As a result, the pond, which is supposed to be dry under normal circumstances, contains water and has a reduced capacity to receive stormwater runoff from the parking areas it is supposed to serve.

The principal behind constructing stormwater management ponds is to contain runoff that drains rapidly from parking lots and other impervious surfaces, and release it slowly into an adjacent waterway, so that the natural drainage capacity of the original channel is overwhelmed with runoff directly from the parking area. In the case of the Tops pond, this function is diminished because the pond is filled with groundwater.

Recently, the Town and Village installed a 30-inch line to relieve some of the drainage problems in the Village, but this is viewed as only a partial solution. The Village recently approved construction of a large auto parts processing facility, Copart, within this area. The Village agreed to permit development if a regional stormwater mitigation wetland was constructed on a site north of the Copart development. This project has not been constructed as of the date of this report. Interviewees reported that this project is stalled in the permit process.



Note large wetland
area north of New
York Central Tracks

Figure 4.9a. 1938 Photo of Village of LeRoy, northwest quadrant

A review of historic aerial photographs of this site showed a steady progression of development along Rt. 5. The 1938 photo shows very little development of this site, except for road front farmsteads and a few businesses on Rt. 5.

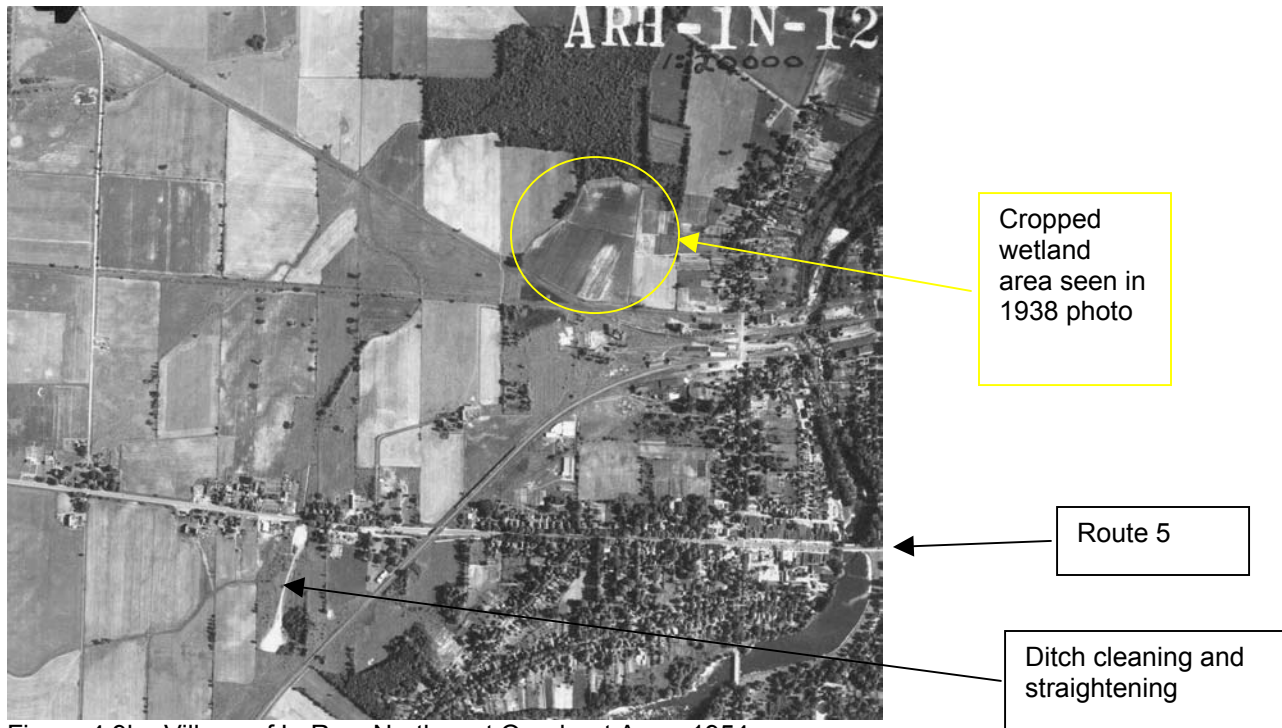


Figure 4.9b. Village of LeRoy, Northwest Quadrant Area, 1954

A large area of marshland is shown north of the intersection of the former NY Central Railroad and the CSX line. The 1954 photo shows that this marshland was ditched, drained and cropped.

Round-shaped ponds and disappearing stream channels indicate the potential for karst conditions in this area. Further investigation would be necessary to confirm the presence of solution channels that cause the disappearance of accumulated surface water.

Between 1963 and 1974, development filled in the gaps of open space along Route 5 between Rt. 19 and Keeney Road.



Figure 4.9c. Village of LeRoy Northwest Quadrant, 1985 (composite)

The 1985 photo shows filling adjacent to the unnamed tributary west of the Rite Aid site.

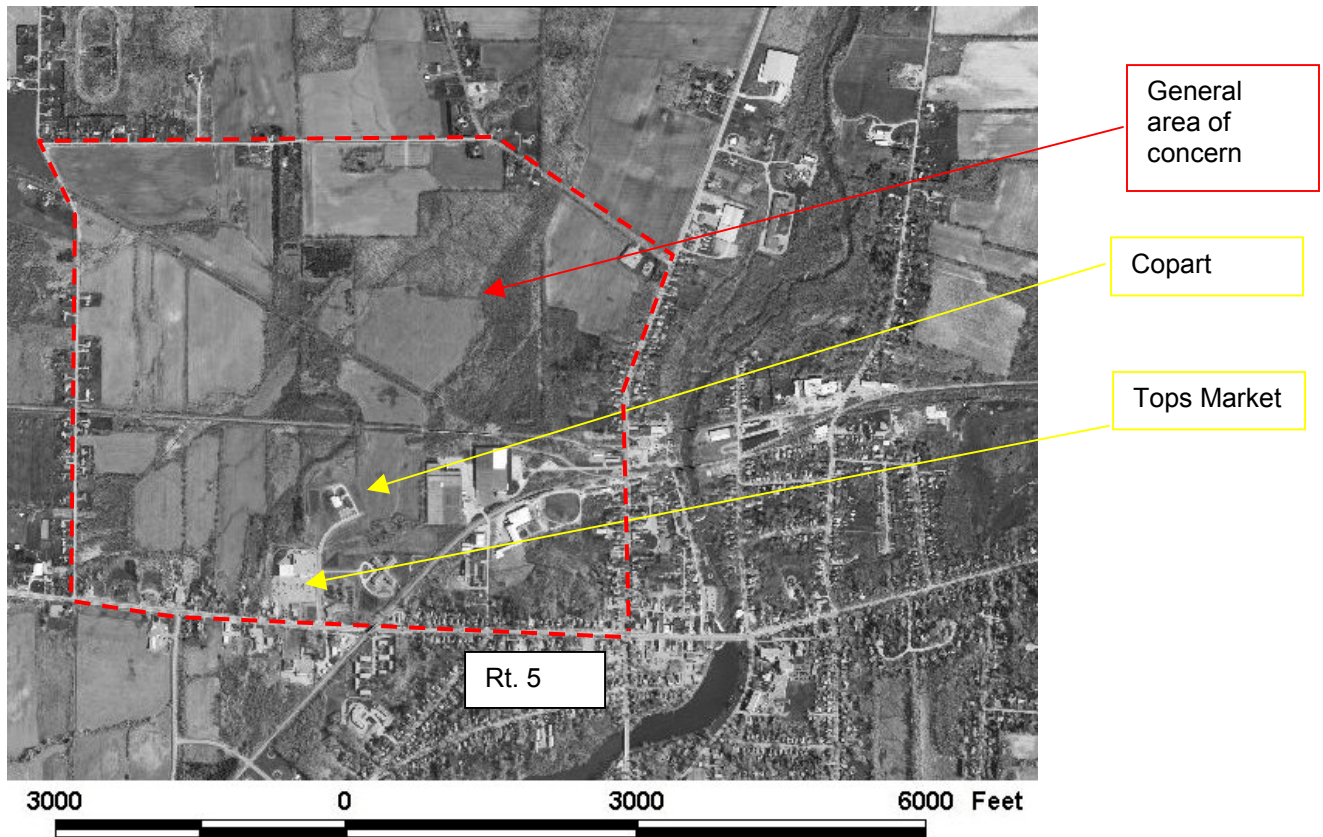


Figure 4.9d. Village and Town of LeRoy, Northwest Quadrant, 2002

The 2002 photo shows the completed Tops Market, the Rite Aid store, a senior apartment complex, and the Copart building. The 2002 photo also shows the Rite Aid detention basin full of water.

Unnumbered site – includes City of Batavia Fire Headquarters, to and including the Holland Land Office, the City Pump Station, the Sheriff's Headquarters, Batavia City Hall, County Courthouse and County Building #1.

This site was suggested as a priority site by Genesee County staff because it includes so many municipal buildings and critical facilities. The Holland Land Office, the City Pump Station, and the Courts facility are located immediately adjacent to the north bank of Tonawanda Creek as it flows through the center of downtown Batavia. Batavia City Hall is located north of Main Street in the same vicinity.

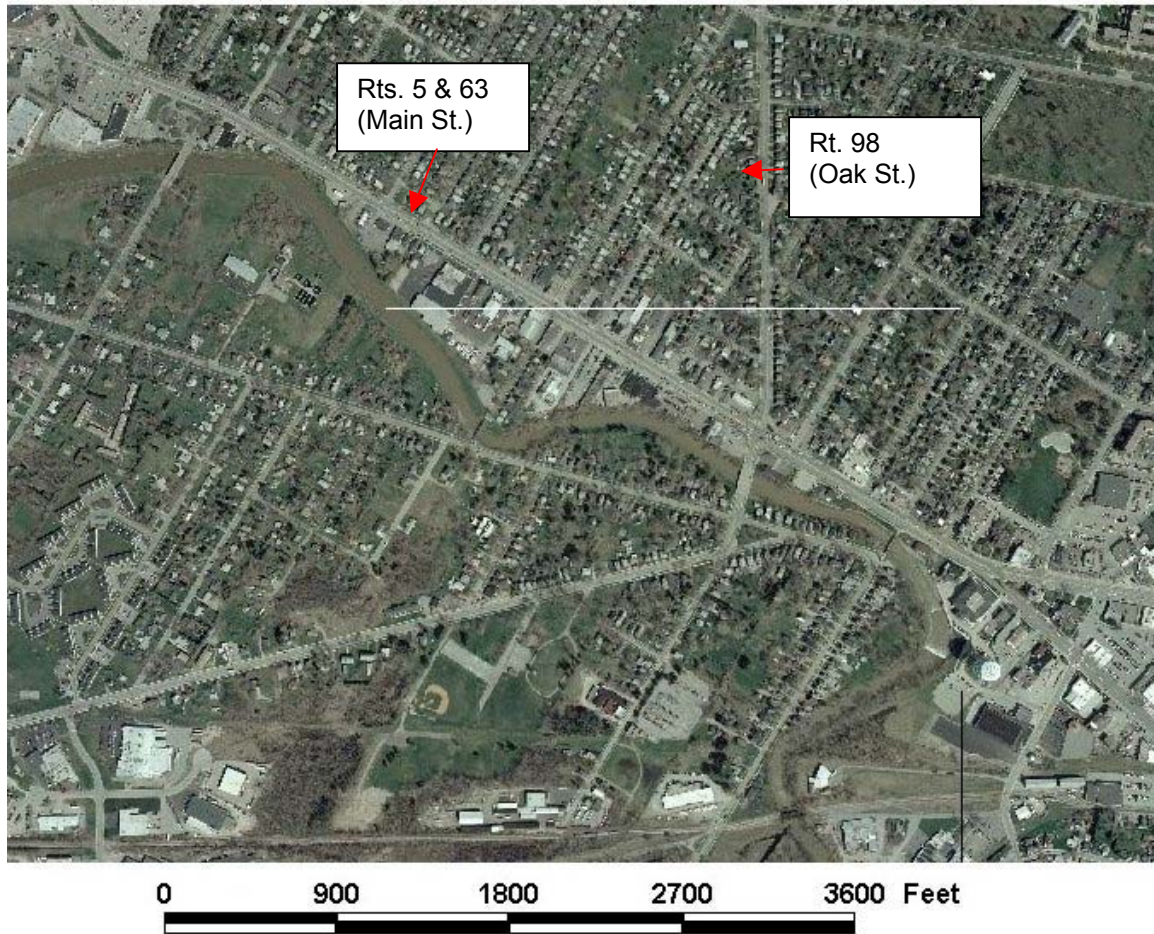


Figure 4.10a. Tonawanda Creek in downtown Batavia, 2002

Tonawanda Creek has flooded this section of the City of Batavia several times over the past 150 years. The most notable flood was in 1942, which prompted installation of a berm around Kibbe Park, and any many streambank stabilization measures. Two low dams were also constructed in the channel of Tonawanda Creek near the water tower, with the apparent purpose of slowing the channel current and reducing the erosive power of the stream. Given the past history of channel meandering in the section between the western City limit and Wortendyke Road, it appears that the dam construction in the City has ameliorated the meandering tendency in the area west of the city.

A significant amount of filling has also been done adjacent to the Tonawanda Channel, particularly in the vicinity of the water tower and several locations south of this point.

The stream channel in this reach is clear of vegetation. The stream banks have been stabilized with gabions and riprap. Flood stage at the gage in Batavia is 9.0 feet. The January 1998 flood reached a stage of 12.02 feet. The highest stage ever recorded for the downtown Batavia gauging station was 14.5 feet on March 1, 1942, with a flow of 4500 cubic feet per second (cfs). The highest flow ever recorded for the Batavia

gagging station occurred on 3/31/1960 with a rate of 7200 cfs. The stage was 12.7 feet for this event.

Several factors influence flooding and stream flow in this reach. If the stream channel has overflowed its banks south of downtown Batavia, much of the flow that would otherwise reach the city, has been spread over the wide flood plain south of Batavia. In many areas south of the city, these widespread floods are confined by railroad tracks that limit back flow toward the creek. In the City of Batavia, several railroad tracks cross the channel of Tonawanda Creek.

South of the water tower, the channel of Tonawanda Creek is less restrained. Small areas of riprap and gabions have been placed to protect strategic points at the outside edges of channel meanders, but the remainder of the channel is vegetated for deciduous woody vegetation.

The NYS Department of Environmental Conservation holds easements along the Tonawanda Channel to do maintenance from the dams west to the city line. The City of Batavia has sought to obtain channel maintenance easements from private property owners in the City to remove debris and make repairs to the stream banks. However, their success in obtaining these easements has not been consistent. A proposal to construct a trail along the channel was not well received by affected residents.

Village of Attica, Sewage Treatment Plant, 122 Prospect Street (Site 145) and Medical Building, Village of Attica, 116 Prospect Street (Site 144)

The Village of Attica Sewage Treatment Plant and a medical building are located adjacent to the channel of Tonawanda Creek at the north end of the Village of Attica. These sites are located in Genesee County. The elevation of these facilities is between 950 and 960 feet above sea level. The top of the channel bank is approximately 950 feet above sea level in this reach.

Buildings on Prospect Street north of Tonawanda Creek have been flooded at least twice in the last ten years, most recently 1998. Two persons lost their lives trying to rescue animals from a veterinary clinic in 1998. The sewage treatment plant is considered a critical facility for the Village of Attica. The site also houses the Department of Public Works. The medical building is located at the northwest quadrant of Prospect Street and Tonawanda Creek. It was constructed in the last ten years.

Soil types mapped for the Prospect Street area north of the Tonawanda Creek channel include Wayland silt loam, Genesee silt loam, Eel silt loam, and Chenango shaly silt loam (0-3% and 3-8% slopes). The Wayland silt loam is a poorly drained, frequently or permanently flooded alluvial soil located within or immediately adjacent to the stream channel. The Eel silt loam is a similar soil, but slightly better drained. The Genesee silt loam soil is the well drained member of this group of alluvial soil. Areas mapped as Genesee soils still flood frequently, but do not remain flooded for more than a few days.

Chenango shaly silt loam soils are found on the lower banks of valley walls in this part of Wyoming County.

Review of historic aerial photographs show major meander shifts in this reach of the stream channel. This change is best shown in **Figures 4.11a and 4.11b**.

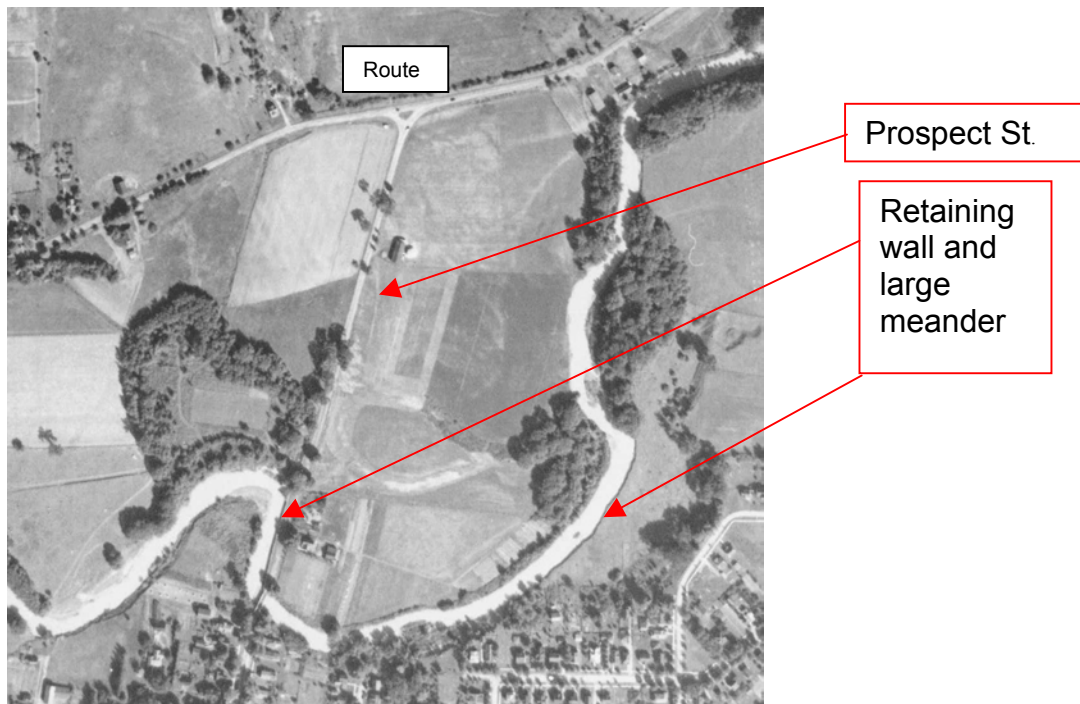


Figure 4.11a. 1938 air photo showing Prospect Street and Channel of Tonawanda Creek. Note location of large meander and retaining wall protecting a section of Prospect Street.

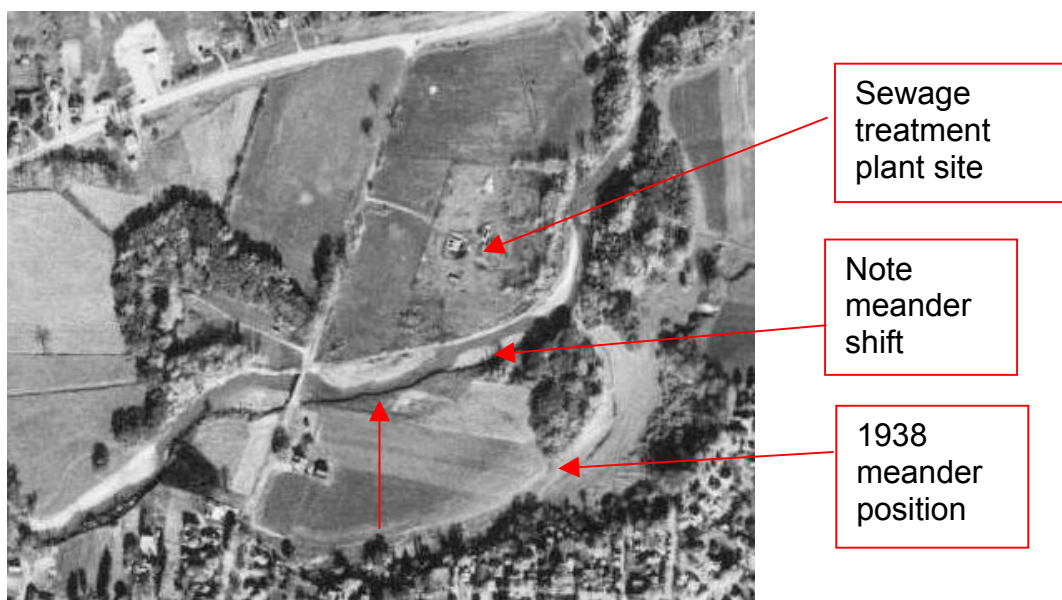


Figure 4.11b. 1954 air photo of Prospect Street and Tonawanda Creek Channel. Note the northward shift in the main channel.

The 1938 photo shows little development except for two farmsteads between Tonawanda Creek and Route 98. The main channel of Tonawanda Creek is located approximately 1650 feet south of Route 98. A retaining wall or other reinforcing structure is located along the west side of Prospect Street, along the east stream bank. The purpose for this structure appears to protect an existing farmstead and the roadway. Two sharp meanders are compressed between Route 98 and Prospect Street in this reach. The channel appears to be very silty, and actively eroding unvegetated streambanks. A large barn on the east side of Prospect Street is located near the present-day site of the sewage treatment plant. No treatment plant is evident in the photo.

The 1954 photo shows the same farmstead in place across from where the retaining wall was located; however the retaining wall has been removed, and the channel of Tonawanda Creek has moved approximately 500 feet north of its 1938 location. A road entrance is evident at the location of the present-day medical building. Several small buildings are evident at the present-day location of the sewage treatment plant. A gravel bar appears to be accreting on the east side of the Prospect Road bridge over Tonawanda Creek.

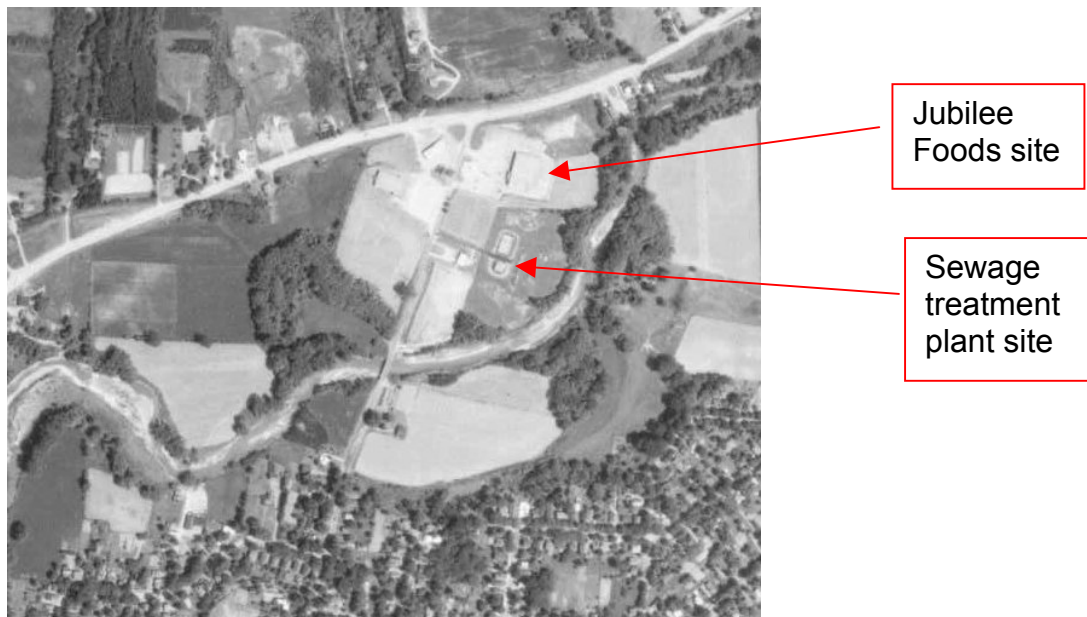


Figure 4.11c. 1963 air photo of Prospect Street sites.

The 1963 air photo shows the development of the Jubilee Foods building, a car dealership, and the sewage treatment plant. The sewage treatment plant consists of one aerator, one digester, and several drying beds. The digester building is located approximately 160 feet west of the Tonawanda Creek bank.



Note filling at
northeast
quadrant of
Prospect St.
bridge

Note new
development
along
Prospect St.

Figure 4.11d. 1968 air photo of Prospect Street Sites.

The 1968 air photo shows a few additional buildings north of Tonawanda Creek in the vicinity of the sewage treatment plant. Five new houses are evident between the old meander channel and the present location of the creek channel. The medical building site shows as an old meander channel. The digester building is approximately 175 feet from the west bank of Tonawanda Creek.



Figure 4.11e. 1974 air photo of Prospect Street sites.

The 1974 photo shows evidence of some filling and clearing on the site of the medical building. The stream channel appears to be moving eastward, away from the digester building on the sewage treatment plant site. The distance between the west bank and the digester has increased to about 300 feet.



Figure 4.11f. 1985 air photo of Prospect Street sites

The 1985 air photo shows continuing development of the sewage treatment plant site. The channel meandering does not appear to be threatening the sewage treatment plant buildings directly; however, the nearest digester is approximately 140 feet from the channel. The medical building site remains undeveloped.

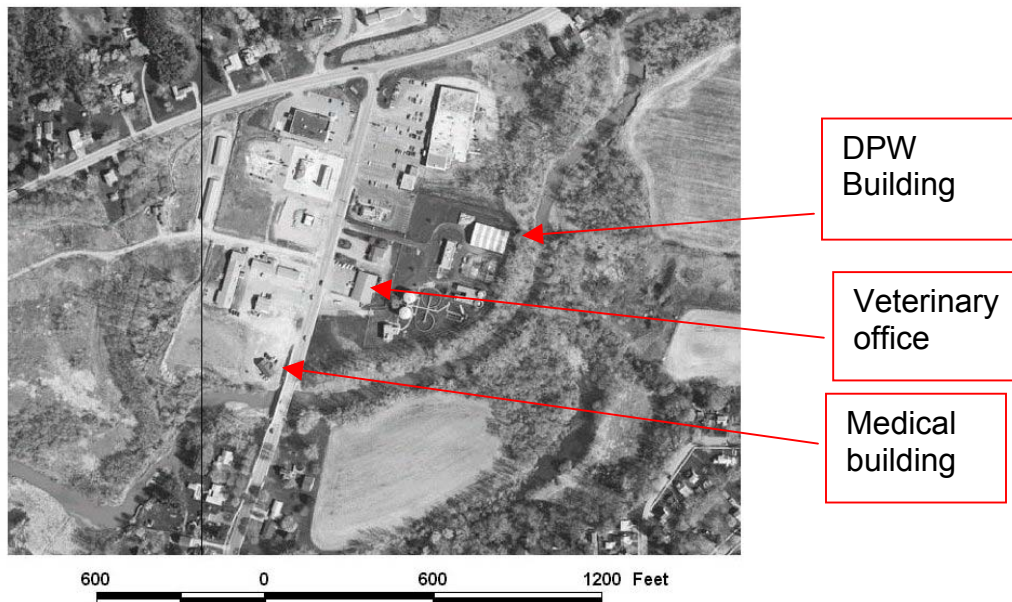


Figure 4.11g. 2002 air photo of Prospect Street sites

The 2002 air photo shows the closest digester is approximately 180 feet from the stream channel. A large building has been added north of the sewage treatment plant complex. The medical building shows in the 2002 air photo of the site. Impervious surface on the medical building/plaza site has increased from 6.4 acres in the 1985 photo to 7.7 acres in the 2002 photo.

Investigation of these sites showed the Prospect Street bridge over Tonawanda Creek to be new (ca. 2000). A large accumulation of gravel debris was observed immediately east and west of the Prospect Street bridge. A sharp right angle bend in the channel east of the bridge may cause ice jamming. The medical building is located immediately adjacent to the creek channel. The building shows no evidence of flood damage, but construction is very recent.

4.6.2 Critical Facilities

Critical facilities are structures or sites that warrant identification because they are of special importance to the community or have special needs that need to be met during flood emergencies. [Table 4.3](#) and [Map 4.5](#) identify the critical that are in the Tonawanda and Oatka Creek Watershed. [Table 4.4](#) identifies the critical facilities that are in or adjacent to the flood zone. Specific flood hazard issues associated with critical facilities are noted in [Section 4.6](#).

Table 4.3 - Critical Facilities, Genesee County

Map ID	NAME	ADDRESS	MUNICIPALITY
1	LeRoy Volunteer Ambulance	1 Tountas Ave	Leroy
3	LeRoy Town Hall	48 West Main St	Leroy
4	LeRoy Sewage Treatment Plant	7500 Red Mill Rd	Leroy
5	U.S. Post Office	2 Main St	Leroy
2	LeRoy Police Department	3 West Main St	Leroy
6	LeRoy DPW Garage	58 North St	Leroy
7	LeRoy Highway Department	7819 East Main St Rd	Leroy
8	Dominion Transmission, Inc.	Asbury Rd	Leroy
9	PAX Television Transmission Tower	10733 S Lake Rd	Pavilion
10	LeRoy Water Filtration Plant	7683 Walker Rd	Pavilion
11	U.S. Post Office	11142 S Lake Rd	Pavilion
12	Pavilion Town Hall/Highway Department	1 Woodrow Dr	Pavilion
13	Pavilion Fire Department	11310 S Lake Rd	Pavilion
14	Rochester Gas & Electric	6903 Ellicott St Rd	Pavilion
15	Pavilion Central School	7014 Big Tree Road	Pavilion
16	Pavilion Elementary School	7071 York Road	Pavilion
17	LeRoy Central High School/Elementary School	Trigon Park	Leroy
18	Hartwood Park	9200 South Street	Leroy
19	Village Green Nursing Home	10 Munson Street	Leroy
20	Heritage Manor Nursing Home	8678 Lake Road	Leroy
21	Lapp Insulator	127 Gilbert Street	Leroy
22	St. Lawrence Explosives	8250 Gulf Road	Leroy
23	Dyno Nobel North America	8451 Circular Hill Road	Leroy
24	Jefferies	6905 Ellicott Street Road	Pavilion
25	LeRoy Airport	8267 East Main Road	Leroy
26	NYS Thruway		Batavia
27	Rochester & Southern Railroad		Pavilion
28	Batavia City Hall	10 West Main Street	Batavia
29	Genesee Valley Transportation	8364 Lewiston Road	Batavia
30	Genesee County Building #1	14 West Main Street	Batavia
31	Alexander Village Hall	3350 Church	Alexander
32	Alexander Post Office	10506 Main Street	Alexander
33	Batavia Post Office	2 West Main Street	Batavia
34	City of Batavia Bureau of Maintenance	147 Walnut Street	Batavia
35	City of Batavia Water Filtration Plant	480 Lehigh Avenue	Batavia
36	Genesee County Old Courthouse	101 West Main Street	Batavia
37	Unified Courts Facility	1 West Main Street	Batavia
38	Genesee County Building #2	3837 West Main Road	Batavia
39	Genesee County DSS/Mental Health	5130 East Main Street	Batavia
40	Genesee County Highway Department	153 Cedar Street	Batavia
41	Town of Batavia Town Hall/Highway Department	3833 Est Main Road	Batavia
42	Verizon Central Office	27 Jackson Street	Batavia
43	Empire Telephone Corporation	2461 Main Road	East Pembroke
44	Time-Warner Communications	29 Cedar Street	Batavia
45	City of Batavia Fire Station #1	18 Evans Street	Batavia
46	City of Batavia Fire Station #2	443 Ellicott Street	Batavia
47	Genesee County Sheriff's Department	14 West Main Street	Batavia
48	Alexander Central School	3000 Buffalo Street	Alexander
49	St. Anthony's School	110 Liberty Street	Batavia
50	Migrant Day Care Center	14 Brooklyn Ave	Batavia
51	East Pembroke Primary School	2486 Main Road	East Pembroke
52	St. Joseph's School	12 Summit Street	Batavia
53	OATKA Milk Products	Cedar and Ellicott Streets	Batavia
54	U.S. Chrome Corporation of NY	31 Swan Street	Batavia

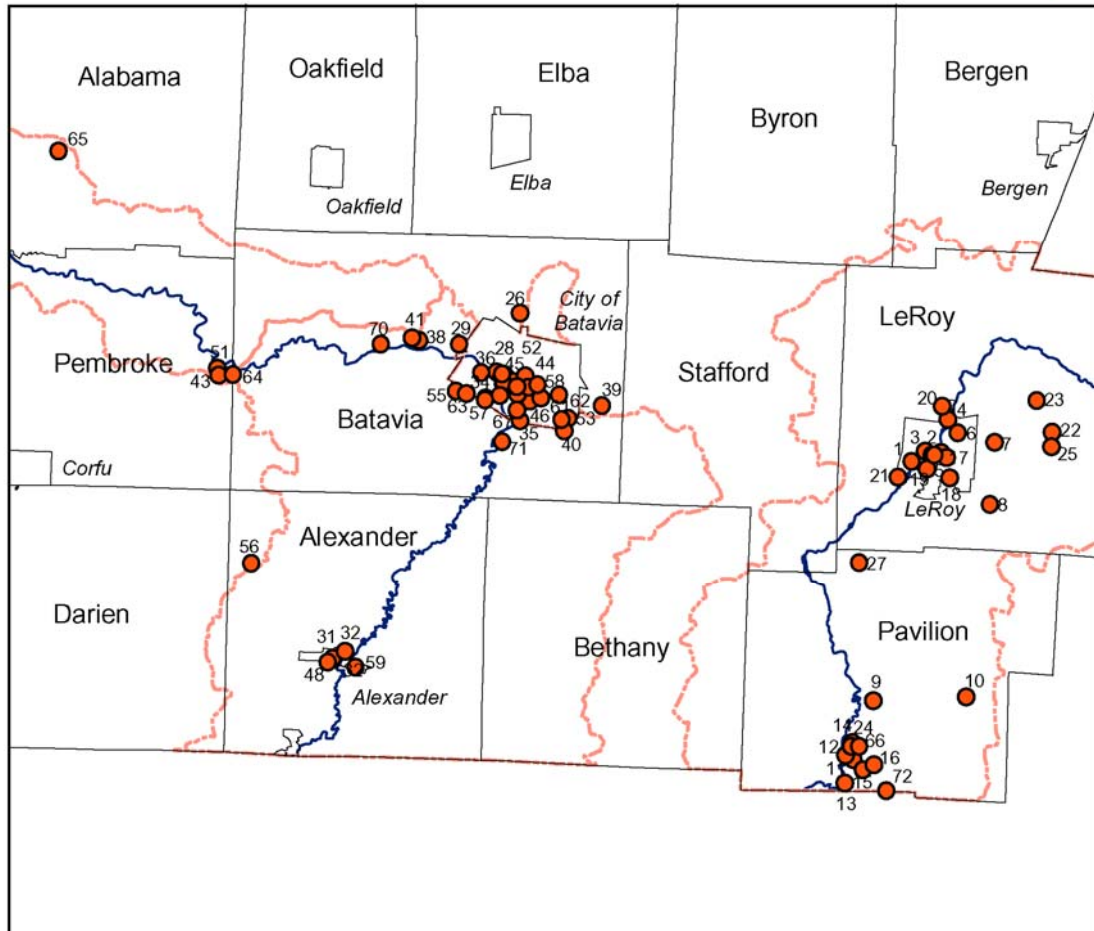
55	Interstate Chemical Co.	4 Treadeasy Ave	Batavia
56	Geer Farm Service	9920 Hickox Road	Batavia
57	Exide Corporation	23 Ganson Ave	Batavia
58	Batavia Agway Crop Center	14 Howard Street	Batavia
59	Norfolk Southern Railroad		Alexander
60	CSW Transportation	45 Center Street	Batavia
61	Laidlaw Bus Service	147 Cedar Street	Batavia
62	City of Batavia Well Field	161 Cedar Street	Batavia
63	City of Batavia Sewer Treatment	9 Treadeasy Ave	Batavia
64	East Pembroke Post Office	8643 Read Road	East Pembroke
65	Basom Post Office	7156 Alleghany Road	Basom
66	Frontier Telephone	11029 S. Lake Road	Pavilion
67	Jackson School	411 S. Jackson Street	Batavia
68	WBTA Radio	438 East Main Street	Batavia
69	LeRoy Nursery School	7 Clay Street	Leroy
70	National Fuel Gas Garage	3593 West Main St Road	Batavia
71	WBTA Radio Transmission Tower	Creek Road	Batavia
72	Pavilion Bus Garage	7166 Big Tree Road	Pavilion

Table 4.4 - Critical Facility At or Adjacent to Flood Zone - Genesee County

Map ID	Facility
8	Pax Transmission
10	LeRoy Water Filtration Plant
12	Pavilion Town Hall, Highway Dept.
19	Village Green Nursing Home
34	City of Batavia Bureau of Maintenance
35	City of Batavia Water Filtration Plant
36	Genesee County Old Courthouse
37	Genesee County Unified Courts Facility
40	Genesee County Hwy Dept., Radio Tower & Batavia Bus Service
43	Empire Telephone Corporation
45	City of Batavia Fire Sta. #1
46	City of Batavia Fire Sta. #2
49	St. Anthony's School
50	Migrant Day Care Center
53	O-at-ka Milk Products
57	Exide Corporation
58	Batavia Crop Center
59	Norfolk Southern Railroad
61	Laidlaw Bus Service
62	City of Batavia Well Field

Map 4.5

Genesee County Critical Facilities

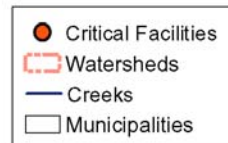
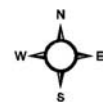


Data Sources:

Critical Facilities - Genesee County Planning
 Watersheds - NRCS
 Creeks - NYS DEC
 Municipal Boundaries - NYS DOT

0 5 10 Miles

Prepared by Genesee/Finger Lakes Regional Planning Council



4.7 Flood Warning System

While no formal warning system is in place in either the Tonawanda or Oatka watershed, downstream communities have benefited from informal warnings of flooding. Dating back to the 19th century, places like Attica and Warsaw have telegraphed or telephoned downstream communities such as Batavia and LeRoy to warn them of rising waters. The geography of the region causes enough of a lag time between rainfall in

the upland areas and flooding downstream for this informal warning system to be effective.

4.8 Parcel Survey

As part of the outreach and information gathering portion of the planning process a survey was sent to each parcel in the flood zone.

4.8.1 Flood Survey Methodology Outline

Survey Creation

For each county, a survey was created for each of the following categories: Agriculture / Undeveloped / Mixed Use, Commercial / Industrial, Residential. Classifications were derived from parcel centroid data obtained from NYS Office of Real Property Services; using the Property Classification Codes. The selection of parcels to be included in the survey process was done geographically based on their location relative to the flood zones. Again, utilizing the data from NYS ORPS, all parcel centroids that are either within the flood zones or are within a 250 foot buffer zone around the flood zones were selected. Parcels that had a Property Classification Code between 300 and 399 were removed because they are classified as Vacant. Parcels with insufficient location information in the Location Number attribute were also removed.

Survey Distribution

In preparation of the survey mailing, address labels and corresponding survey labels were printed utilizing a mail-merge process resulting in labels containing address information extracted from the NYS ORPS database and a unique identification number that would identify the survey when returned. One of the three surveys was then sent to each of the selected parcels, based on the Property Classification Code for that parcel (example: parcels classified as Residential were sent a Residential survey). Surveys were also sent to all project contacts from Planning Committee, each municipality's highest elected official (supervisor, mayor, etc.), Emergency Management Office (Genesee and Wyoming Counties), Planning Departments (Genesee and Wyoming Counties), and Soil & Water Conservation Districts (Genesee and Wyoming Counties). Of the surveys returned by the U.S. Postal Service, surveys were resent to parcels in which address information could be corrected

Survey Follow-Up

A large number of surveys were returned by the U.S. Postal Service. Of these, surveys were resent to parcels in which address information could be corrected. In addition, to increase the response rate and to obtain as much valuable information as possible, a reminder postcard was sent to those parcels who had not returned the completed surveys

Survey Response and Analysis

As surveys were returned, the data contained in the surveys was entered into databases, organized by survey type and county and any and all comments were noted

and compiled for future reference. When the survey process was completed and all data had been compiled, the parcels were mapped based on their unique identification number to determine response rates by municipality, county and watershed for purposes of analysis. Finally, an analysis was performed based on the data contained in the survey response. This analysis was again done by municipality, county and watershed.

Survey Distribution and Response Rates

Total Parcels (in flood zone or in 250 foot buffer area):	4,935
Excluded Parcels:	1,051
Vacant (according to RPS):	251
Insufficient Address Information:	800
Surveys Sent:	3,884
Returned by U.S. Postal Service:	966
Resent (with attempted Address correction):	566
Not Resent (unable to correct Address Information):	400

Returned by U.S. Postal Service (2 nd group of resent surveys):	252
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**Reminder postcards sent to 2,341 parcels (March 24, 2003)*

Surveys Reaching Destination:	3,884
	- 400
	- 252

Surveys returned from parcels not originally included:	+ 4
	3,236

Responses:	1,119
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Percent (%) of Response (1,119 of 3,236):	34.6%
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Distribution of Responses:

Genesee – Residential:	702
Genesee – Commercial/Industrial:	78
Genesee – Ag/Undeveloped/Mixed:	20
Wyoming – Residential:	283
Wyoming – Commercial/Industrial:	30
Wyoming – Ag/Undeveloped/Mixed:	6

4.8.2 Survey Analysis

Genesee County - Agricultural

Responses (Response Rate): 20 out of 47 responded (43%)

In Flow Path: 70% of respondents said that the Tonawanda, Little Tonawanda, Oatka, or one of its tributaries flowed through their property

- Included those people that noted that a particular creek functions as a property line and therefore flows through their property

Flooded: 55% of respondents reported that they had been flooded at that property

- Included those people that noted “property only” flooding and no structural flooding

Flooded Yearly: 50%

Depth: reported any amount of depth

Depth - Other: most of the respondents noted other as yard, field, or property

Damage - Structure: Respondents reported \$500 or more of damage to structures

Damage of Contents (basement, garage, 1st floor, or property): noted \$200 of damage or more

Recovery - Days: Reported between 1 and 6 days for recovery time

Recovery - Weeks: Number of respondents that reported 1-4 weeks

Insurance: Out of 20 respondents in Genesee County 1 had Flood Insurance (5%).

Insured and Flooded: 100% of people who have insurance were flooded (1 of 1).

Flooded and Insured: 9% of people who were flooded had insurance (1 of 11).

Assistance:

- Flood Insurance & FEMA aid: None
- Other federal funds: 2 respondents in Pavilion reported having other federal aid.
- State Emergency Management Agency Funds: None
- Flood Insurance: None
- Other Insurance: 17% of those reporting flooding also reported receiving aid from other Insurance.
- Other Sources: None.

Genesee - Commercial/Industrial

Responses (Response Rate): 78 out of 243 responded (32%)

Flow Path: 14% of respondents said that the Tonawanda, Little Tonawanda, Oatka, or one of its tributaries flowed through their property

- Included those people that noted that a particular creek functions as a property line and therefore flows through their property

Flooded: 19% of respondents reported that they had been flooded at that property

- Included those people that noted “property only” flooding and no structural flooding

Flooded Yearly: 0%

Depth: reported any amount of depth

Depth - Other: most of the respondents noted other as yard, field, or property

Damage - Structure: Respondents reported \$500 or more of damage to structures

Damage of Contents (basement, garage, 1st floor, or property): noted \$200 of damage or more

Recovery - Days: Reported between 1 and 6 days for recovery time

Recovery - Weeks: Number of respondents that reported 1-4 weeks

Insurance: Out of 78 respondents in Genesee County 14 had Flood Insurance (18%).

Insured and Flooded: 21% of people who have insurance were flooded (3 of 14).

Flooded and Insured: 20% of people who were flooded had insurance (3 of 15).

Assistance:

- Flood Insurance & FEMA aid: Only 13 out of 30 respondents that reported flooding and having flood insurance also reported receiving aid from FEMA (43%).
- Other federal funds: None
- State Emergency Management Agency Funds: None
- Flood Insurance: None
- Other Insurance: None
- Other Sources: None

Genesee - Residential

Responses (Response Rate): 702 out of 2,071 Responded (34%)

Flow Path: 28% of respondents said that the Tonawanda, Little Tonawanda, Oatka, or one of it's tributaries flowed through their property

- Included those people that noted that a particular creek functions as a property line and therefore flows through their property

Flooded: 21% of respondents reported that they had been flooded at that property

- Included those people that noted “property only” flooding and no structural flooding

Flooded Yearly: 5%

Depth: reported any amount of depth

Depth - Other: most of the respondents noted other as yard, field, or property

Damage - Structure: Respondents reported \$500 or more of damage to structures

Damage of Contents (basement, garage, 1st floor, or property): noted \$200 of damage or more

Recovery - Days: Reported between 1 and 6 days for recovery time

Recovery - Weeks: Number of respondents that reported 1-4 weeks

Insurance: Out of 702 respondents in Genesee County 185 had Flood Insurance (26%), 150 of which were in the City of Batavia

Insured and Flooded: 19% of people who have insurance were flooded (35 of 184).

Flooded and Insured: 24% of people who were flooded had insurance (35 of 146).

Assistance:

- Flood Insurance & FEMA aid: only 4 out of 36 respondents that reported flooding and having flood insurance also reported receiving aid from FEMA (11%)
- Other federal funds: None
- State Emergency Management Office Funds: 2 people reported receiving SEMO
- Flood Insurance: Only 19% of the respondents that were flooded and had flood insurance checked that they received aid from their flood insurance
 - 3 out of the 9 Flood Insured respondents in Alexander that reported flooding received Flood Insurance Assistance (33%)
- Other Insurance: 4% of those reporting flooding also reported receiving aid from other insurance
- Other Sources: 4 responded noted that their local fire departments provided assistance (those local fire departments were in the City of Batavia, Town of Batavia, Village of LeRoy, and Town of Pavilion)

5 - Flood Mitigation Action Plan Goals and Objectives

Goals:

- To develop a watershed wide and municipal approach for mitigating and reducing flood hazards along the Oatka and Tonawanda Creek Watersheds.
- Adopt plans for participating communities that identify the most effective means of implementing measures to eliminate or reduce the impacts of flood hazards.

Objectives:

- Apply a planning process that will insure a cooperative effort between all interested parties, public and private.
- Identify the flood hazards and assess the risks associated with those hazards.
- Involve the public to create awareness and understanding of local flood hazards and their associated risks and build public support for actions to mitigate those risks.
- Develop and evaluate appropriate mitigation activities to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program (NFIP).
- Develop and evaluate appropriate mitigation activities to reduce or eliminate the long-term risk of flood damage to natural resources.
- Identify and evaluate alternative incentives and resources available to encourage flood mitigation activities by the affected municipalities.
- Adopt implementation-ready flood mitigation plans for participating communities and counties.
- Assist in securing state and federal approval for each of the municipal flood mitigation plans.

6 – Flood Mitigation Action Steps

The flood mitigation action items presented here are measures that the Planning Committee has determined will meet the flood mitigation goals set forth by the Committee. The action items are based on the risk assessment in Chapter 4 and/or attempt to build upon efforts and projects previously undertaken or currently underway.

The action items are divided into six categories:

- Public Awareness and Information
- Preventive Measures
- Natural Resource Protection
- Property Protection
- Structural Measures
- Emergency Services

6.1 General Flood Mitigation Action Steps

Preventive Measures

All Hazard Mitigation Plan

It is recommended that the Joint Flood Mitigation Plan be used as the first phase in the development of a All Hazard Mitigation Plan. The Disaster Mitigation Act (DMA) of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988. The DMA authorizes the creation of a pre-disaster mitigation program to make grants to State, local and tribal governments. It also includes a provision that defines mitigation planning requirements for State, local and tribal governments. This new section (Section 322) establishes a new requirement for local and tribal mitigation plans; authorizes up to 7 percent of the HMGP funds available to a State to be used for development of State, local and tribal mitigation plans; and provides for States to receive an increased percentage of HMGP funds from 15 percent to 20 percent if, at the time of the disaster declaration, the State has in effect a FEMA approved State Mitigation Plan that meets the criteria established in regulations.

Community Rating System

It is recommended that the municipalities along the Oatka and Tonawanda Creek take advantage of the development of the Joint Flood Mitigation Plan and any subsequent implementation by participating in the Community Rating System. The NFIP's Community Rating System (CRS) recognizes community efforts beyond minimum standards by reducing flood insurance premiums for the community's property owners. Trained Flood Plain Administrator

Flood Plain Administrator

Every community that participates in the NFIP has a Flood Plain Administrator identified in their local FPO. In some cases it is the Town Board, but in most cases it is the Zoning Enforcement Officer or Building Inspector. That person should be trained by

attending training sessions provided by NYSDEC. The FPO issues floodplain development permits for activities in the floodplain.

Floodplain Mapping

While all municipalities have their floodplains mapped with the exception of Middlebury, not all municipalities have a detailed base flood elevation mapped. Therefore, all communities should be mapped so that there is a defined base flood elevation (A Zone). If there is no defined base flood elevation an engineer should be used, along with design standards for siting of new development in the floodplain.

Natural Resource Protection

It is recommended that Tonawanda and Oatka Creeks be classified using the Rosgen Stream Classification System. Classification of the creeks, particularly at priority sites identified by this study will provide a means to understand the existing conditions of the stretch of the stream. Based on the classification of the stream, appropriate stream management technologies can be evaluated and recommended for the specific stream type and concern at the location.

The Rosgen Stream Classification System uses the stream morphology to categorize the stream. The following is a list of the items evaluated to categorize a stream by the Rosgen process:

1. Channel type (Single versus Braided)
2. Degree of Entrenchment
3. Width to Depth Ratio
4. Sinuosity
5. Water Surface Slope
6. Median Size of the Bed material.

Rosgen has developed the following objectives for conducting a stream classification using his method:

1. Predict a river's behavior from its appearance,
2. Develop specific hydraulic and sediment relationships for a given stream type,
3. Provide a mechanism to extrapolate site-specific data to stream reaches having similar characteristics.
4. Provide a consistent frame of reference for communicating stream morphology and condition among a variety of disciplines and interested parties.

Several state and federal agencies utilize the Rosgen Stream Classification system to manage river and revitalize stream systems.

The following in-stream measures may be appropriate for use in upper reaches of the Oatka and Tonawanda Creek, particularly in areas with sandy or gravelly substrates. Further evaluation is needed to determine appropriate placement and usage.

J-Hook Vanes

J-hook vanes are single-arm structures whose tip is placed in a “J” configuration and partially embedded in the streambed such that they are submerged even during low flows. The J-hook vane is designed to reduce accelerated stream bank erosion on the outside bend of meanders through the diversion of the thalweg away from unstable banks (Rosgen, No date). When properly positioned, J-hook vanes induce secondary circulation of the flow thereby promoting the development of scour pools.

Cross Vanes

Cross vanes are low profile in-stream “U” shaped structures with the apex of the “U” directed up stream. Cross vanes are designed to form pools and riffles, typical of natural streams. If designed properly the cross vanes decrease the near bank shear stresses diverting the energy to the center of the channel thus reducing scour along the banks (Rosgen, No date). Cross vanes can be utilized to reduce scour at bridge abutments.

W-Weir

W-Weirs are low profile in stream “W” shaped structures if looking in the down stream direction. W-weirs are similar to cross vanes, providing a riffles and pools, but the of the stream is directed away from the banks and the center of the stream. If designed properly the W-weir will reduce scour along the stream bank bridge abutments as well as a mid-stream bridge pier.

Debris

Debris in the streams is one of the main issues associated with flooding in the Oatka and Tonawanda Creeks. Therefore debris removal should be a high priority for implementation. All communities should work cooperatively with county agencies, Soil and Water Conservation District, NYSDEC, ACE and neighboring counties and municipalities on the following:

- Inventory and prioritize sites
- Discuss permitting issues with NYSDEC and ACE
- Acquire land owner cooperation/partnerships, including easements
- Develop a mechanism/model for funding debris removal

Additionally, consideration should be given to the following timing and location issues:

- Start downstream and work upstream
- Consider conservation easement areas so that water can be stored temporarily in low-lying, flood-prone areas
- Consider time of year. In most cases late summer to early winter might be best
- Consider restrictions on clearing such as trout spawning season

Siltation

Siltation is caused by erosion. The following mitigation measures are recommended:

- Maintain riparian buffers on stream channels
- Discourage agricultural practices within 50 to 100 feet of stream. This could include grass filter strips, agricultural best management practices, and keeping livestock out of stream channel.
- In places that are experiencing streambank erosion consider streambank restoration
- Vegetate and maintain road ditches

Property Protection

Repetitive Loss

It is recommended that properties covered by a contract of flood insurance under the NFIP, that has suffered flood damage on two or more occasions over a 10-year period ending on the date when a second claim is made, in which the cost to repair the flood damage, on average, equals or exceeds 25% of the market-value of the structure at the time of each flood loss event consider filing for Repetitive Loss coverage to implement long-term structural solutions to flooding problems.

Structural Measures

Development and impervious surfaces

In general all municipalities should consider the impact of impervious surfaces for stormwater management and facilities should be designed accordingly to meet current flood plain and stormwater regulations.

Culvert Maintenance and Sizing

Culvert maintenance and sizing is one of the main issues associated with flooding along the Oatka and Tonawanda Creeks. Therefore culvert maintenance should be a high priority for implementation. This should include an aggressive program of monitoring, cleaning, and partnering with NYSDOT (state and federal roads). Additionally, sizing of culverts associated with private driveways crossing roads or streams should be installed using a hydraulic analysis that is handled by an engineer or qualified professional.

Little used and/or abandoned railroads are also a major issue associated with flooding along the Oatka and Tonawanda Creeks. The following process is recommended:

- Establish ownership and responsibility
- Inventory problem areas
- Work with owner to make aware of the problem and, if necessary, enforce drainage laws

Dams

In a few cases dams are failing. In all cases dams need regular inspection and maintenance, including the old NYSDEC wildlife dams cited in [Section X](#). The process should include improvement to the existing inventory that would establish ownership and establish which dams could be removed or replaced where appropriate.

6.2 County-Wide Flood Mitigation Action Steps

Public Awareness and Information

Official Flood Information

An important part of raising awareness of flood hazards is providing residents with a way of determining the potential risk they face during periods of heavy rainfall. The availability of residents to view the FIRM and understand it is essential to informing them of flood hazards affecting them. Revisions to the FIRM are documented by FEMA and confirmation is sent to the municipality. The following official flood information dissemination is recommended:

- Make copies of the FIRM available at libraries and town and village halls
- Make copies of the Letters of Map Amendments (LOMA) at libraries and town and village halls
- Make copies of the Flood Mitigation Plan available at libraries and town and village halls

Disclosure of flood hazards to potential property owners is another important aspect of informing those at risk to flood hazards. Real estate agents are an important resource in disseminating flood hazards to potential property owners. It is recommended that a package be prepared for real estate agents that outlines the risks inherent in purchasing a property that lies in a floodzone and a description of the NFIP and who to contact for further information.

Flood Prevention Ordinances

While the majority of land in the flood zones is zoned appropriately- agricultural or low density residential, as was noted throughout the municipal interview process, there needs to be a greater awareness of a municipality's own ordinances on the part of the elected officials, local government staff, and citizens. In many cases, there are Flood Prevention Ordinances on the books but varying degrees of knowledge and/or enforcement of them. Many flooding problems can be avoided with thorough understanding and rigorous enforcement of the existing regulations. One way that could potentially improve this situation is to make the flood zones an official zoning designation, as the Town of Byron in Genesee County has done. Then, the flood prone areas automatically show up on zoning maps of the municipality, they are seen more often by residents, officials, and staff, and the flood prevention ordinance is more completely integrated into the general land use regulations of the community, rather than being more of a stand-alone law and separate map.

Preventive Measures

Land Use Controls

While the majority of land in the flood zones is zoned appropriately- agricultural or low density residential- there are a few recommended changes to consider.

- First would be to reduce the amount of commercial, industrial, and higher density residential land located in floodplains. Commercial and industrial buildings are often harder to flood-proof or elevate, as required for buildings in a flood zone, and are more expensive to repair/replace in the event of flooding. In addition, should such buildings ever get flooded, the ripple effects through the community in terms of lost days of work could be significant.

Also, higher density residential units such as mobile homes and apartment complexes are more susceptible to flood damage and can present problems in the event of evacuations.

- Second, there is minimal land zoned for parks or recreational areas in the flood zones. This type of land use is ultimately the most appropriate for flood prone areas. Not only do they take advantage of the stream as a community amenity and provide public access to this amenity, but parks and open space suffer relatively little damage in the event of flooding.
- Finally, to implement these recommendations, it is suggested that municipalities regularly review their zoning ordinances and land use regulations. Not only does this make newer officials and staff aware of them, but it allows for the possibility of more frequent updates or re-writes.

6.3 Community Flood Mitigation Action Steps

Town of Alabama

Preventive Measures

Every community that has NFIP has a Flood Plain Administrator identified in their Flood Prevention Ordinance. At present there is no designated Flood Plain Administrator. It is recommended that a Flood Plain Administrator should be designated

Town of Alexander

Preventive Measures

Every community that has NFIP has a Flood Plain Administrator identified in their Flood Prevention Ordinance. At present there is no designated Flood Plain Administrator. It is recommended that a Flood Plain Administrator should be designated

There is flooding of residences in the floodplain along Genesee and Maplewood Avenue (Site 104.01). This is a priority site. Consider the following preventative measures:

- Flood proofing basements of structures that have been damaged by repeated flooding.
- Examine the issue of land use controls in flood prone areas. Determine if additional restrictions are needed to prevent or reduce residential use of flood prone areas. Consider an overlay district that restricts structural development in active meander areas.

- Support county efforts to inspect and maintain road and railway culverts with in-kind labor and equipment use.

The Town of Alexander DPW Garage and Salt Storage (Site 157) is a priority site. It is located in the Village but is owned by the Town. The barn has experienced frequent flooding. The following preventive measures should be considered:

- Flood proofing essential utilities
- Relocation of the highway garage and salt storage building to an upland site

Natural Resource Protection

The stream channel has little or no buffer from cropland on Dorman Road (Site 107). Adoption of agricultural practices to accommodate flooding should be considered, including the maintenance of riparian buffers.

There are erosion problems on West Bethany Road south of Brookville Road (Site 194). Streambank and roadside ditch stabilization should be considered.

Property Protection

There is flooding of residences in the floodplain along Genesee and Maplewood Avenue. Additionally, based on the parcel survey conducted for this planning process nine parcels in the Town have been listed as flooded outside of the areas designated on the FIRM (see [Table 4.1](#)). Flooding included basement and property damage. The Town/Village of Alexander should consider a remapping of the floodplain in known flood damage areas to reflect conditions more accurately.

Structural Measures

The Cookson Road bridge over Tonawanda Creek (Site 106) is out of service. Consider possible consequences of road abandonment.

There is flooding of residences in the floodplain along Genesee and Maplewood Avenue (Site 104.01). This is a priority site. Consider raising the elevation of structures that have been damaged.

The Peaviner Bridge over Tonwanda Creek (Site 191) floods frequently. Consideration should be given to raising the road profile and reconstructing the bridge if needed.

There are several residences in the floodplain on Dorman Road (Site 107). Consideration should be given to relocation or floodproofing. Some funding could be supplied by the Repetitive Loss program (see [Section X](#)).

Culvert maintenance and sizing is an important issue throughout the watershed (see Culvert Maintenance and Sizing Section above). A specific high priority location in the Town of Alexander is the railroad grades through the town (193).

Emergency Services

There is flooding of residences in the floodplain along Genesee and Maplewood Avenue (Site 104.01). This is a priority site. Consider the following measures:

- Offering relocation assistance to residents whose homes have been damaged repeatedly
- The use of the NFIP Repetitive Loss program
- Develop an emergency notification system for use with area residents
- Participate in emergency response exercises to assure that personnel are adequately trained for flood emergencies.

Village of Alexander

Preventive Measures

The Village of Alexander has 6.1 acres of flood zone in the Tonawanda Creek watershed. A significant portion of this, 4.5 acres or nearly 74% has an industrial designation, with an additional 6.9% zoned for higher density residential. While this is partially explained by Alexander's historic village center being very close to the creek, it is crucial for the Village to re-examine its zoning to ensure that industrial development is kept out of flood prone areas. There may be additional lands outside the flood plain more appropriate for industrial zoning while flood plain lands might be re-zoned to open space or lower density residential.

Every community that has NFIP has a Flood Plain Administrator identified in their Flood Prevention Ordinance. At present there is no designated Flood Plain Administrator. It is recommended that a Flood Plain Administrator should be designated

State Route 20 over Tonawanda Creek bridge at Alexander - DEC recommends a conservation easement or purchase of land in the Tonawanda Creek floodplain to preclude development.

The Village of Alexander Sewer Pump Station (Site 156) is a priority site. It is prone to frequent flooding because it is the lowest point in the surrounding area. The following preventive measures should be considered:

- Flood proofing the pump station and its utilities.
- Develop a program to monitor the Tonawanda Channel for log, debris and ice jams.

The Town of Alexander DPW Garage and Salt Storage (Site 157) is a priority site. The barn has experienced frequent flooding. The following preventive measures should be considered:

- Flood proofing essential utilities
- Relocation of the highway garage and salt storage building to an upland site

Natural Resource Protection

Log jam and debris clearance is important throughout stream corridor (see above section for details). Specific high priority locations include:

- Railroad Avenue bridge piers (Site 104.04)

- Route 20 bridge over Tonawanda Creek (Site 155)

The sewer plant outfall (Site 158) is threatened by streambank erosion. Rip rap or rock gabion should be considered near outfall site.

Property Protection

Based on the parcel survey conducted for this planning process 6 parcels have been listed as flooded outside of the areas designated on the FIRM (see [Table 4.1](#)). Flooding included damage to basements and first floor of structures. The Village of Alexander should consider a remapping of the FIRM.

The Village of Alexander Sewer Pump Station (Site 156) is a priority site. It is prone to frequent flooding because it is the lowest point in the surrounding area. The following preventive measures should be considered:

- Provide in-kind labor and materials, and funding support to the Soil and Water Conservation District or other agency to remove debris and ice jams from the Tonawanda Creek channel before an emergency develops.
- Develop a memorandum of agreement with the owners of the railroad rights of way east of the pump station to clean out clogged culverts under the railroad beds.

Structural Measures

The Village of Alexander Sewer Pump Station (Site 156) is a priority site. It is prone to frequent flooding because it is the lowest point in the surrounding area. Consider raising the pump station above the base flood elevation.

The Village of Alexander Highway DPW and Salt Storage barn (Site 157) is a priority site. It has experienced frequent flooding. The following structural measures should be considered:

- Flood proofing essential utilities
- Relocation of the highway garage and salt storage building to an upland site

There is potential for exposure of sanitary sewer mains along streambank (Site 102.01). Because of streambank erosion area needs to be cleared of snags and logjams regularly and area should be considered for rip rap or stone gabion. Additionally, flood-proofing utility lines should be considered.

Culvert maintenance and sizing is an important issue throughout the watershed (see Culvert Maintenance and Sizing Section above). A specific high priority location in the Village of Alexander is Railroad Avenue, from Main Street eastward to the old railroad grade (Site 153).

On Route 20 east of the Tonawanda Creek (Site 154) NYSDOT should consider options of raising the roadway profile to avoid roadway flooding.

The school bridge over a Tonawanda Creek tributary (Site 159) is subject to frequent washouts. The school should consider building a new bridge with a larger hydraulic opening.

Emergency Services

The Village of Alexander Sewer Pump Station (Site 156) is a priority site. It is prone to frequent flooding because it is the lowest point in the surrounding area. Consider adding a high water level alarm and notification system for area residents.

The Village of Alexander Highway Garage and Salt Storage barn (Site 157) is a priority site. It has experienced frequent flooding. The following measures should be considered:

- Develop an emergency response plan to assure prompt notification of appropriate personnel, and to relocate vehicles and equipment to upland sites.
- Install a high water level alarm to notify key department personnel
- Participate in emergency planning and response exercises

Village of Attica (Genesee County portion)

The Village of Attica straddles the Wyoming-Genesee County line, with the bulk of the Village's land area, and its historic business district, in Wyoming County. However, the Genesee County portion contains the newer, auto-oriented, commercial area that has developed in the past 30-40 years.

Preventive Measures

The Genesee County portion of the village contains 2.5 acres of flood zone in the Tonawanda Creek watershed. All of this land is designated as commercial. While it may be argued there is a need to reinforce existing development and infrastructure through zoning, this area needs to be re-examined, since it is frequently flooded and especially since this is where the two deaths occurred in the 1998 flood. Re-zoning to open space should be actively pursued, as should measures to protect, elevate, or even purchase and relocate any buildings that exist in this flood prone area. The Village of Attica should work with the Town of Alexander to ensure appropriate amounts and types of zoning in this commercial corridor area.

The Village of Attica Sewage Treatment Plant (Site 145) and the medical building at 116 Prospect Street are priority sites. The site has been flooded at least twice in the last ten years. Consideration should be given to flood overlay zones in the Village code.

Natural Resource Protection

The Village of Attica Sewage Treatment Plant (Site 145) and the medical building at 116 Prospect Street are priority sites. The site has been flooded at least twice in the last ten years. Evaluation of the feasibility of additional streambank stabilization on the outside edge of the meander west of prospect street, behind the Department of Public Works and near the sewage treatment plant should be considered.

Structural Measures

The Village of Attica Sewage Treatment Plant (Site 145) and the medical building at 116 Prospect Street are priority sites. The site has been flooded at least twice in the last ten years. Consideration should be given to purchase and relocation of the medical center, restaurant, day care center and related properties in the small plaza on Prospect Street and the homes on the west side of Water Street north of the Village/Town Hall. Consider a feasibility study to determine which facilities at the sewage treatment plant could be flood-proofed effectively. Consider raising aeration chambers to prevent overflow.

Emergency Services

The Village of Attica Sewage Treatment Plant (Site 145) and the medical building at 116 Prospect Street are priority sites. The site has been flooded at least twice in the last ten years. The following emergency service measures are recommended:

- Develop an emergency response plan to move vehicles and all important equipment out of the DPW complex.
- Determine an appropriate notification sequence and procedures.
- Conduct training exercises focusing on notification, shut-down sequence, and emergency measures to protect the plant facilities.
- Development an emergency notification system for residents and businesses on Prospect Street, particularly those between the old meander and Route 98.

City of Batavia

Preventive Measures

The City of Batavia has 65.2 acres of flood zone in the Tonawanda Creek watershed. It is the largest community and only city in the Joint Flood Plan study area. It is also historic, with settlement dating back to 1802. Fully 50% of the 65.2 acres is designated as low density residential and open space. Reflecting the more developed nature of the City though, the other 50% is designated commercial, industrial, or special incentive zoning. While recognizing the difficulty of finding land for larger scale commercial and industrial development in an older community, as well as the importance of encouraging investment to reinforce the historic city core, there may be other areas more appropriate for commercial and industrial zoning. The city should review its zoning in flood prone areas and be exceedingly vigilant in enforcing design standards and building codes for structures in these areas.

Although the City of Batavia Water Treatment Plant (Site 109) did not sustain damage in flood events during 1968 or 1998, county officials believe that this facility should be better protected during flood events. A feasibility study should be considered to determine options for upgrading and flood-proofing portions of the plant.

The Fire Headquarters, to and including the Holland Land Office, the City Pump Station, the Sheriff's Headquarters, City Hall, County Courthouse, and County Building #1 is a priority site. The Tonawanda Creek has flooded this section of the City several times over the past 150 years. Potential preventive measures include:

- Review the feasibility of flood proofing basement areas of municipal structures not already protected. Determine whether this can be done within the architectural requirements for historic structures (e.g. the Holland Land Office, the Historian's Office). Consider flood proofing vital utilities such as pump stations, electrical substations and other facilities.
- Review locations for vital communications centers and determine needed improvements to assure that these facilities remain functional during flood events.
- Review storm and sanitary utilities in the affected area for potential use of one-way valve gates and other means of preventing backflow from affecting sanitary and storm sewers in low lying areas of the City.

The County Highway Department is isolated during flooding events. It is recommended that vehicles and equipment be prepositioned off site in the case of flooding events and alternative access should be explored.

Natural Resource Protection

The City would like to obtain more easements along Tonawanda Creek south of the DEC dams. At the present time, they have no easements and cannot go in and clean debris out of the channel. The land along the channel is all in private ownership. A trail idea was floated at one time, but had significant public opposition. If an easement program is pursued, it would have to be strictly voluntary with land owners.

The former Chapin/Sylvania Plant (Site 110) may have industrial contaminants on site and it located in the 100-year floodplain. The cleanup status and the assurance that remediation address the issue of flooding should be determined.

Property Protection

Based on the parcel survey conducted for this planning process 14 parcels have been listed as flooded outside of the areas designated on the FIRM (see [Table 4.1](#)). Flooding included basement, first floor and general property damage. The City of Batavia should consider a remapping of the FIRM.

Fire Headquarters, to and including the Holland Land Office, the City Pump Station, the Sheriff's Headquarters, City Hall, County Courthouse, and County Building #1 is a priority site. The Tonawanda Creek has flooded this section of the City several times over the past 150 years. It is recommended that record storage locations be reviewed and determine the need to move vital records to upper floors or other sites. Also, reduce or eliminate computer work stations in the basement and first floor of the buildings.

The Cedar Street wells (Site 109.01) are in the floodplain and may have casing tops below the height of the 100-year flood plain. These should be floodproofed as needed.

Structural Measures

The Cedar Street railroad underpass (Site 110.01) should consider the use of a back-up pump station.

The Oakland Avenue levee should be regularly inspected and maintained to ensure functionality.

Erosion problems have been experienced at a private residence at the intersection of Jackson and Oakland Avenues (Site 171). It is recommended that the outbuilding located near the creek bank be removed.

A determination should be made as to whether the big ditch area (Site 175) floodplain should be remapped given that it is based on a former natural drainage feature. Additionally, the structural condition should be continually assessed.

Emergency Services

Although the City of Batavia Water Treatment Plant (Site 109) did not sustain damage in flood events during 1968 or 1998, county officials believe that this facility should be better protected during flood events. Emergency services mitigation recommendations include:

- Develop an emergency plan to address flooding at the water treatment plant. The plan should discuss plant accessibility during flood events and steps to protect the physical plant facilities. The plan should address specific issues such as shut-down sequence, notification procedures, location and quantities of emergency supplies and other issues. This plan should be reviewed with plant employees and managers, and county emergency management staff on an annual basis.
- Review plant access routes and determine options to improve accessibility in the event of flooding.

The Fire Headquarters, to and including the Holland Land Office, the City Pump Station, the Sheriff's Headquarters, City Hall, County Courthouse, and County Building #1 is a priority site. The Tonawanda Creek has flooded this section of the City several times over the past 150 years. Potential emergency services mitigation measures include:

- Consider installation of a high water level alarm at the gauging station in Batavia and in the Village of Attica that would alert City officials and County emergency personnel.
- Review emergency plans to assure that emergency response vehicles are moved away from flood-prone areas if a flood alert is received.
- Review notification procedures in emergency plans to assure that appropriate parties are notified and have adequate response time.

Town of Batavia

Public Awareness and Information

The West End Trailer Park (Site 112.01) is a priority site. It has residential structures that are located below the base flood elevation and are at risk during future flood events. Park residents should be educated about emergency evacuation procedures including the use of a brochure showing evacuation routes and emergency shelter locations.

The Dreamland Mobile Home Park (Site 112.02) is a priority site. It has residences that must be evacuated during every flood event. Park residents should be educated about emergency evacuation procedures including the use of a brochure showing evacuation routes and emergency shelter locations.

Residential development along South Main Street adjacent to Tonawanda Creek (Site 113) is a priority site. South Main Street is often closed during flood events because most of the land is low-lying. Residents in this area must be evacuated to avoid injury or loss of life. Consideration should be given to development of an educational brochure for residents in flood-prone areas about evacuation procedures and flood protection steps that can be taken by individual property owners.

Preventive Measures

The Town of Batavia has 382.8 acres of flood zone in the Tonawanda Creek watershed, the most of any municipality in the study. While a significant portion, 77%, has an agricultural designation, 23% has an industrial, commercial or higher density residential designation, which is a very high percentage compared to the other rural towns in the study area. It is high compared even to other towns that surround more developed areas, such as Warsaw and LeRoy.

It is crucial for the Town to re-examine its zoning to ensure that industrial and commercial development is kept out of flood prone areas. As Batavia is still largely rural, there are additional lands outside the flood plain more appropriate for industrial or commercial zoning while flood plain lands might be re-zoned to open space or lower density residential. This is especially critical in that the Town of Batavia faces higher than average development pressures in the Route 5 corridor west of the City and this area also has greater potential for flooding problems. It is very important that the town be aware of, understand, and vigorously enforce appropriate building codes for anyone wishing to build in a flood prone area.

The Town was unsure if it has a designated Flood Plain Administrator. It is recommended that the Town look into whether it has one or not and if not a person should be designated

Residential development along South Main Street adjacent to Tonawanda Creek (Site 113) is a priority site. South Main Street is often closed during flood events because most of the land is low-lying. Residents in this area must be evacuated to avoid injury or loss of life. The following preventive measures should be considered:

- Evaluate the feasibility of flood-proofing public utilities along the roadway
- Require any new development proposed within the 100 year floodplain to conform to floodplain development standards.
- Seek easements from private property owners along the channel to permit access for stream channel monitoring and removal of woody debris and ice jams.

Property Protection

Based on the parcel survey conducted for this planning process seven parcels have been listed as flooded outside of the areas designated on the FIRM (see [Table 4.1](#)). Flooding included basement damage. The Town of Batavia should consider a remapping of the FIRM.

Purchase and relocation of the trailer park on West Main Road (Route 5)

Purchase and relocation of houses along Dorman Road. The Dorman Road houses are gradually being abandoned anyway, and there is little chance that anything new could get built there, given that it would have to comply with modern standards (essentially houses would have to be on stilts).

There is significant residential development along South Main Street adjacent to Tonawanda Creek (Site 113). It is a priority site. South Main Street is often closed during flood events because most of the land is low-lying. Residents in this area must be evacuated to avoid injury or loss of life. Additionally, the areas south of South Main Street (Site 163) are not shown on the FIRM, but perhaps should be. Consideration should be given to a remapping of this area. It is recommended that the area south of South Main Street be reviewed for a letter of map revision.

Structural Measures

Place rip-rap along the outside bend just north of Route 5 near Stegman Road, to protect the road and/or move the roadway north, away from the Creek.

The West End Trailer Park (Site 112.01) is a priority site. It has residential structures that are located below the base flood elevation and are at risk during future flood events. Consideration should be given to upgrading structures with first floor elevations below the base flood elevation and site infrastructure to meet current floodplain development standards.

The Dreamland Mobile Home Park (Site 112.02) is a priority site. It has residences that must be evacuated during every flood event. Consideration should be given to upgrading structures with first floor elevations below the base flood elevation and site infrastructure to meet current floodplain development standards.

The residential development along South Main Street adjacent to Tonawanda Creek (Site 113) is a priority site. South Main Street is often closed during flood events because most of the land is low-lying. It is recommended that the Town evaluate the feasibility of raising the first floor elevation of non-conforming residential structures in the floodplain to conform with flood plain development regulations.

The Route 5 (Bushville) bridge over Tonawanda Creek area (Site 116.01) is subject to ice jamming in the spring, which wears away the bridge abutments. The condition of the bridge should be monitored and repaired or replaced as needed.

The Valu Plaza on West Main Street (Site 162) is experiencing flooding problems consistent with other locations along West Main Street. Retrofitting a stormwater management facility should be considered in this area.

There is a flooding problem with a small, unnamed tributary of Tonawanda Creek near Route 63 and Veterans Road (Site 164). It is recommended that the area be reviewed to develop an appropriate stormwater management option. This could include a comprehensive stormwater management study.

Emergency Services

The West End Trailer Park (Site 112.01) is a priority site. It has residential structures that are located below the base flood elevation and are at risk during future flood events. The following emergency service measures should be considered:

- Relocation assistance to residents whose mobile home pads are most frequently affected by flooding
- Develop and emergency flood notification system for all mobile home park residents
- Request the mobile home park operator advise emergency management personnel of any park residents who may require special assistance during an evacuation.

The Dreamland Mobile Home Park (Site 112.02) is a priority site. It has residences that must be evacuated during every flood event. The following emergency service measures should be considered:

- Relocation assistance to residents whose mobile home pads are most frequently affected by flooding
- Develop and emergency flood notification system for all mobile home park residents
- Request the mobile home park operator advise emergency management personnel of any park residents who may require special assistance during an evacuation.

The Wortendyke Road bend in the Tonawanda Creek (Site 116) experiences frequent ice jamming. It is recommended that an alarm system be installed to warn residences if ice builds up.

Town of Bethany

Preventive Measures

Due to possible interest and need, the Town should consider forming a townwide Drainage district.

Natural Resource Protection

Log jam and debris clearance is important throughout stream corridor (see above section for details). Additionally, due largely to debris, streambank erosion is now an issue and the banks need to be stabilized. Specific high priority locations include:

- Gick Creek and Conway Road (Site 180)
- Mill Road (178)
- Francis Road (179)

- Little Tonawanda Creek, Mill-Linden area (Site 182)
- Smith Road (Site 183)

Property Protection

Based on the parcel survey conducted for this planning process two parcels have been listed as flooded outside of the areas designated on the FIRM (see [Table 4.1](#)). Flooding included property and structural damage. The Town of Bethany should consider a remapping of the FIRM.

Consider relocation of homes on Mill Road (Site 178) and Little Tonawanda Creek at the Hamlet of Linden (Site 124).

Town of Darien

Preventive Measures

Every community that has NFIP has a Flood Plain Administrator identified in their Flood Prevention Ordinance. At present there is no designated Flood Plain Administrator. It is recommended that a Flood Plain Administrator should be designated

Structural Measures

Culvert maintenance and sizing is an important issue throughout the watershed (see Culvert Maintenance and Sizing Section above). A specific high priority location in the Town of Darien is Route 20 (Site 185).

On the Darien-Alexander Townline Road and Old Attica Road (Site 186) flooding causes shoulder erosion. Consideration should be given to reinforcement of road shoulders and use of check dams and other energy dissipation mechanisms.

Town of LeRoy

Preventive Measures

The Town of LeRoy has 113.5 acres of flood zone in the Oatka Creek watershed. 86.7% has an agricultural or low density residential designation. However, 12.5% or 14.3 acres has a commercial or industrial land use designation. This is a relatively high percentage of flood prone land designated for more intensive development. It is recommended that the town be extremely vigilant in enforcing flood plain ordinances on any commercial or industrial development that does occur and review its zoning in flood zones and possibly re-zone to agriculture, low-density residential, or open space.

There is flooding in the northwest sector of the Village and adjacent areas of the town due to development in low-lying areas without adequate stormwater detention and lack of maintenance on railroad culverts and adjacent drainage ditches (Site 517). This is a priority site. The following preventive mitigation measures are recommended:

- Consider remapping the floodplain for the Town and Village. The remapping should include flood-prone areas along Quinlan, Keeney, Route 5, and West Bergen Road, and the northwest quadrant of the Village.

- Contact the applicant for the Copart project and determine what is required to obtain the permit to construct the stormwater detention facility. The permit application should be completed and this facility should be constructed.
- Organize a program to monitor the problem areas for culvert clogs and stream channel maintenance.
- Consider a culvert clean-out memorandum of understanding with the owners of the railroad rights of way that cross the site.
- Consider a review of land uses permitted in flood prone areas, and determine any needs for code revision.

Property Protection

Based on the parcel survey conducted for this planning process five parcels have been listed as flooded outside of the areas designated on the FIRM (see [Table 4.1](#)). Flooding included basement and general property damage. The Town of LeRoy should consider a remapping of the FIRM.

There is a greenhouse (Site 505.01) and several residences in the Oatka Trail-Wilcox Road area (Site 522) that are in floodplain and experience frequent flooding. Relocation should be considered for homes with repeated damage.

Structural Measures

The LeRoy Airport area (Site 509) should be reviewed for impacts and determine whether mitigation is required.

There is heavy potential flooding at the LeRoy Water Filtration Plant (Site 516), which is located in the Town of Pavilion. It is recommended that operation of the water filtration plant be discontinued. LeRoy and Pavilion should consider the use of Monroe County Water Authority.

Village of LeRoy

Preventive Measures

The Village of LeRoy Sewage Treatment Plant (Site 515) is in a flood-prone area. It is a priority site. The following preventive measures should be considered:

- A feasibility study to determine which facilities at the plant are critical for operation and require flood proofing to comply with flood plain development regulations.
- Remapping the Oatka Creek floodplain in the vicinity of the Village. Publicly available FIRMs only show an unnumbered A zone.

There is flooding in the northwest sector of the Village and adjacent areas of the town due to development in low-lying areas without adequate stormwater detention and lack of maintenance on railroad culverts and adjacent drainage ditches (Site 517). This is a priority site. The following preventive mitigation measures are recommended:

- Consider remapping the floodplain for the Town and Village. The remapping should include flood-prone areas along Quinlan, Keeney, Route 5, and West Bergen Road, and the northwest quadrant of the Village.

- Contact the applicant for the Copart project and determine what is required to obtain the permit to construct the stormwater detention facility. Consider providing funding assistance to complete the permit application and begin construction of this needed facility.
- Organize a program to monitor the problem areas for culvert clogs and stream channel maintenance.
- Consider a culvert clean-out memorandum of understanding with the owners of the railroad rights of way that cross the site.
- Consider a review of land uses permitted in flood prone areas, and determine any needs for code revision.

Natural Resource Protection

Wolcott Street (Site 514) is an area of extensive streambank erosion. It is recommended that rip rap be used along the shoreline.

Property Protection

Based on the parcel survey conducted for this planning process four parcels have been listed as flooded outside of the areas designated on the FIRM (see [Table X](#)). Flooding included damage to basements. The Village of LeRoy should consider a remapping of the FIRM.

The Pro-Fac Plant (Site 520) flood regularly. Consideration should be given to retrofitting opportunities for stormwater detention. Site should comply with new federal Stormwater Phase II regulations.

The new school is in a potential flood-prone area (Site 521). The floodplain in the area should be remapped and the area should be evaluated to ensure adequate stormwater detention.

Structural Measures

The Main Street Dam (Site 513) should continue to be monitored and repaired as needed.

Munson Street Dam (site 524) has structural issues. It is recommended that the general dam mitigation measures (see above) be followed.

Emergency Services

The Village of LeRoy Sewage Treatment Plant (Site 515) is in a flood-prone area. It is a priority site. It is recommended that a flood hazard emergency plan be developed for the plant that reviews contingencies and shut-down sequences with all operators and emergency response personnel.

Town of Pavilion

Preventive Measures

The Town Hall, Library, and Highway Garage (Site 563) are located in a flat, flood-prone area adjacent to Oatka Creek. This is a priority site that tends to flood for a number of reasons. Consider the following preventive measures:

- Participating in a county-wide program of stream channel inspection and channel maintenance. Consider remapping the floodplain of Oatka Creek in the Town to establish known base flood elevations.
- Construct flood proof storage facilities for vital records and library supplies

Natural Resource Protection

The Town Hall, Library, and Highway Garage (Site 563) are located in a flat, flood-prone area adjacent to Oatka Creek. This is a priority site that tends to flood for a number of reasons including debris buildup. Consider participating in a county-wide program of stream channel inspection and channel maintenance. Inspect all stream channel and tributary culverts regularly and clean as needed.

There is bank erosion between Route 20 and Route 63 (Site 567). It is recommended that there be revegetation of eroded streambank and adoption of appropriate agricultural management practices so that riparian buffer is maintained.

Property Protection

Based on the parcel survey conducted for this planning process nine parcels have been listed as flooded outside of the areas designated on the FIRM (see [Table 4.1](#)). All nine reported basement flooding. The Town of Pavilion should consider a remapping of the FIRM.

There are homes on Pavilion Center Road by the Rochester Southern Railroad (Site 511) where flooding occurs regularly. Consideration should be given to elevating and floodproofing.

There are flooding problems in the Hamlet along small tributary between Route 19 and Route 63 (Site 561). The Creek runs close to building foundations in this area. Consideration should be given to relocation.

The Hanson's Concrete Plant and headquarters (Site 566) has been subject to flooding. It is recommended that the plant consider relocation of the headquarters building or moving of vital records and business operations to a less flood-prone location.

Structural Measures

The Town Hall, Library, and Highway Garage (Site 563) are located in a flat, flood-prone area adjacent to Oatka Creek. This is a priority site. Consider raising the elevation of the affected buildings above the base flood elevation.

Culvert maintenance and sizing is an important issue throughout the watershed (see Culvert Maintenance and Sizing Section above). A specific high priority locations in the Town of Pavilion are the clogged railroad culverts south of the Hamlet (Site 562.01) and the culverts clogged along Route 19 south of the Hamlet (Site 562).

There is heavy potential flooding at the LeRoy Water Filtration Plant (Site 516), which is located in the Town of Pavilion. It is recommended that operation of the water filtration plant be discontinued. LeRoy and Pavilion should consider the use of Monroe County Water Authority.

Emergency Services

The Town Hall, Library, and Highway Garage are located in a flat, flood-prone area adjacent to Oatka Creek. Consider the following measures:

- Develop an emergency notification system for flood alerts
- Install a high water level alarm on the main channel of Oatka Creek to alert key personnel.

Town of Pembroke

Preventive Measures

The Town of Pembroke has 81.1 acres of flood zone in the Tonawanda Creek watershed with much of it, 88.2%, having an agricultural or low density residential designation. However, there is an area of 8.2 acres that has a higher density residential designation. The Town may want to re-examine this zoning to ensure that higher density residential development does not occur in flood prone areas. As Pembroke experiences more rural development, as well as development in the Thruway interchange area, it is important to enforce appropriate building codes for anyone wishing to build in a flood prone area.

Every community that has NFIP has a Flood Plain Administrator identified in their Flood Prevention Ordinance. At present there is no designated Flood Plain Administrator. It is recommended that a Flood Plain Administrator should be designated

Structural Measures

The North Pembroke Dam (Site 115) is an old mill structure. It is recommended that this structure be removed.

The East Pembroke Dam (Site 114) is an old structure that may be failing. NYSDEC has recommended that the dam be removed.

The Thruway bridge over Tonawanda Creek (Site 114.01) flooded some years ago. Studies have shown undersized culverts and the need for additional detention. These, along with raising the profile of the bridge should be considered.

Town of Stafford

Preventive Measures

The Town of Stafford has 8.7 acres of flood zone in both the Tonawanda Creek and Oatka Creek watersheds; however the Town was never completely mapped by FEMA, so the actual flood prone land is probably greater. All of the land in the current flood zone has an agricultural/low density residential designation. As Stafford experiences more rural development, it is important to enforce appropriate building codes for anyone wishing to build in a flood prone area.

Tonawanda Reservation

Preventive Measures

The Tonawanda Reservation appears to have a floodplain mapped but they are not listed on the Community Status List. The Seneca Nation of Indians in Erie, Cattaraugus, Chautauqua, and Allegany Counties are listed, so it's not an issue of Indian Reservations being left off the list. DEC Region 9 has worked on flooding issues with the Seneca Nation of Indians so was concerned about the status of the Tonawanda Senecas in relation to the list. It is recommended that the Tonawanda Senecas work to coordinate between DEC Regions 8 and 9 on how to best serve the Reservation (since it lies in both Regions).

Appendix A - Municipal Resolutions

Appendix B - Planning Committee

Roger	Becker	Town of Orangeville
Rod	Cook	Town of Batavia
Thomas	Douglas	Town of Bethany
James	Duval	Genesee County Planning
William	Gick	Town of Bethany
Jason	Haremza	G/FLRPC
Henry	Hooper	Town of Darien
John	Hurst	Town of Middlebury Supt of Highways
William	Hurst	Town of Middlebury
Mike	Kehl	Town of Sheldon Highway Department
Dan	Kelsey	Supervisor, Town of Alexander
Neil	Kingdon	Supervisor, Town of Pavilion
Roger	Lander	Genesee County Emergency Mgmt
Thomas	Lowe	Town of Alexander Supt of Highways
James	Mallory	Town of Pembroke
Felipe	Oltremari	Genesee County Planning
Doug	Post	Village of Attica
Ronald	Pritchett	Supervisor, Town of Alabama
Dave	Reckahn	Wyoming County SWCD
Fran	Reese	Lu Engineers
Jim	Reger	Wyoming County Emergency Mgmt
Richard	Scharlau	Mayor, Village of Alexander
Gene	Sinclair	Town/Village of LeRoy
Tom	Skoglund	Wyoming County Planning
Jerome	Smith	Town of Warsaw
George	Squires	Genesee County SWCD
James	Starr	Town of Pavilion
John	Strathearn	Town of Pavilion, Supt of Highways
William	Wagner	Village of Alexander
Len	Walker	City of Batavia
David	Zorn	G/FLRPC

**Tonawanda and Oatka Creek Watersheds
Municipal Flood Mitigation Planning
Organizational Meeting Notes
November 25, 2002**

Present: Courtnie Simmons, G/FLRPC, George Squires, Genesee County Soil & Water Conservation District (SWCD), James Duval, Genesee County Planning, Felipe Oltremari, Genesee County Planning, Tom Skoglund, Wyoming County Planning, Dave Reckahn, Wyoming County SWCD, Roger Lander, Genesee County Emergency Management, Jim Reger, Wyoming County Emergency Management, Fran Reese, Lu Engineers, David Zorn, G/FLRPC

Introductions

The following project specific items were discussed:

General Organization

County Level/Hazard Assessment/Technical Committee

County Meetings - Village of Attica Fire Hall, 4th Tuesday, starting January 28, 2003 at 10 am

County contacts - see attached list

Municipal Level - Genesee and Wyoming County Emergency Management will mail out a letter to each municipality asking for a resolution and a contact person. David Zorn will get list of goals, objectives and benefits to Genesee County Planning to include in the letter. The return letter will allow for the following:

Identify participating municipalities

Identify key contact person in each municipality

Identify potential municipal representatives to county meeting

Identify key people in each municipality

Work with key person/people in each municipality to explore expectations for meeting with each community

Watershed Management Plan Processes - Dave Reckahn and George Squires are part of the Oatka Creek Watershed Management Plan process. The Oatka Creek Watershed Committee is planning a series of four public meetings. They have also produced a summary of their public findings. David Zorn will also contact Rick Venvertloh, Chairman of the Oatka Creek Watershed Committee and ask about the public findings summary and coordinating with their public meetings and web site.

Existing studies, plans and reports - G/FLRPC will set up a time to review existing studies, plans and reports at Genesee County Planning and SWCD, and review HAZNY reports at Genesee and Wyoming Counties Emergency Management office. Other documents include:

City and Town of Batavia Flood Study

Town of Alexander Flood Study

Tonawanda Creek (AOC)

Warsaw and Attica Studies - Jim Reger will check

USGS Gaging Stations - Attica (Tonawanda Creek), Batavia (Tonawanda Creek), Warsaw (Oatka Creek), and Garbutt (Oatka Creek)

Public Participation and Awareness

Public Participation Committee in each municipality for the purposes of public education and outreach will be based on municipality key contacts and various municipalities working together. Jim Duval and Roger Lander will check with Genesee County Association of Municipalities.

Residential and commercial surveys to assess properties that have been flooded in the past and the damage incurred will be reviewed by Technical Committee. A suggestion was made to check with Doug Post in Attica to see what their survey was.

Public Hearings - one at draft for review and input and one at final.

Assess the Flood Hazards and Risks

Utilize a Geographic Information System to analyze and map known flood hazards in relation to existing land uses. This will include:

- Floodways and floodplains as shown on FEMA Flood Insurance Rate Maps

- Areas not identified on the FIRM that are known to flood based on existing studies, surveys, historical records, and public meetings

- Digital parcel boundaries based on county tax maps (Genesee will supply), parcel images and centroids (Wyoming will supply parcel images) and Real Property parcel data to analyze property-specific attributes.

- Digital orthophotos (including Pictometry (November 2001) in Genesee County)

- Slope and elevations

- Surface water

Utilize aerial photography to determine changes in stream patterns and land use (county based).

Genesee County SWCD has 1938, 1954, 1963, 1974, 1985, 1990. Genesee County Planning has 1938, 1954, 1968, 1974, 1985. Wyoming County SWCD has similar aerial photography.

Describe the known flood hazards. (Municipal and county) This will include:

- Source of floodwater,

- Discussion of past floods, and

- Depths, velocities, and warning times of previous flooding if available.

Evaluate streambank erosion based on previous studies by county, state, and federal agencies (SWCDs). Genesee County SCS did a study many years ago. Wyoming County SWCD has some records.

Identify the locations of critical facilities and structures (town/village halls, schools, power substations, bridges, culverts, roads (county) - identify with counties, etc.). The process will include the following:

- Develop a list of critical facilities and structures

- Review list with Technical Committee and municipalities

- Map critical facilities and structures

- Review draft map

- Final map

Action Items

Appointments need to be made to go through the libraries at the county and municipal offices

Addition of Upper Tonawanda Creek to the map

A summary report should be made after every meeting to post to the Genesee County website

Provide the planners with a one-page fact sheet about the project's goals and benefits to be included in the municipal mailing.

Counties will put together a draft letter that will go to municipalities

Contact Rick Venvertloh of the OWMP to get a summary of their meetings, possible coordination of public meetings, and possibly gain information from State of the Oatka Creek Watershed publication.

Genesee County Planning Department will supply G/FLRPC with digital tax parcels. Wyoming

County Planning Department will supply G/FLRPC with scanned images of tax parcels.

G/FLRPC will get gauging station data

G/FLRPC to develop a draft list of critical facilities and structures

Next Meeting: January 28, 2003

**Tonawanda and Oatka Creek Watersheds
Municipal Flood Mitigation Planning
Technical Committee
Meeting Minutes
January 28, 2003**

**Attica Fire Hall
Attica Village Offices
9 Water Street
Attica, NY 14011**

Present: Courtnie Simmons, G/FLRPC, George Squires, Genesee County Soil & Water Conservation District (SWCD), James Duval, Genesee County Planning, Felipe Oltremari, Genesee County Planning, Tom Skoglund, Wyoming County Planning, Dave Reckahn, Wyoming County SWCD, Roger Lander, Genesee County Emergency Management, Jim Reger, Wyoming County Emergency Management, Fran Reese, Lu Engineers, David Zorn, G/FLRPC, James Mallory, Town of Pembroke, Dan Kelsey, Town of Alexander, Thomas Lowe, Town of Alaxander, William Glick, Town of Bethany, Len Walker, City of Batavia, Rod Cook, Town of Batavia, Pearl Granger, Wyoming County Emergency Management, Jim Starr, Neil Kingdom, Town of Pavilion, Douglas A. Post, Village of Attica, Henry J. Hooper, Town of Darien, John W. Hurst, Town of Middlebury, Gene Sinclair, Town/Village of LeRoy

Introductions

Project Updates

Meetings where held with Genesee and Wyoming County EMO, SWCD, Planning Departments to gather county level data and information

The following items are mapped

- Revised watersheds
- Floodplains (except for Middlebury)
- Parcels/centroids
- Digital orthophotos
- Slope and elevation
- Surface water
- Critical facilities

- Need to do some follow-up to pinpoint sites that were not initially pinpointed on map

- Some sensitive sites will not be pinpointed on map but will be noted by municipality for report

- SPDES permits (Genesee)

Dam inventory has been started

First Technical Committee minutes were sent to Technical Committee and supplied to Genesee County web site

Letter to municipalities and Indian Reservation asking for participation with goals and benefits summary sent out

Contacted Oatka Creek Watershed Committee Chairman regarding working together on public education

Upcoming Tasks

Additional County Interviews - Department of Health, Highway Superintendent, County Historian, County Code Officer (Wyoming)
Municipal Interviews
NYS Department of Environmental Conservation and Army Corps of Engineers Interviews
Survey distribution
Finalize dam inventory
Analyze municipal regulation in the flood zone
Analyze land use in flood zone

Residential, Commercial, Agricultural Floodway Survey Review and Approval

Additional changes to survey or survey process
Include major tribs on survey and add map
Include "Structure and impervious surface" category to "Damage or loss incurred from event" section on Agriculture survey
Include "mixed use" category on survey
Indicate on survey cover letter that individuals that have questions can contact the municipal contact as well as G/FLRPC
Survey cover letter will be on County Emergency Management stationery
Include project goals/objectives/benefits with survey
Send copy of survey mailing to municipal contact, village mayors, and town supervisors
Deadline for survey review and comments back to David Zorn is January 31, 2003

Additional County Contacts - Department of Health, Highway Superintendent, County Historian, County Code Officer (Wyoming)

Municipal Sample Interview and Resource Checklist (see enclosed Sample Interview and Resource Checklist) - Committee decided to have all review comments back to David Zorn by 1/31/03

Municipal Participation - County EMOs will finalize list of participating municipalities and get municipal resolutions by end of first week in February

NYSDEC/ACE/SEMO Technical Committee Involvement - The committee felt that it would be a good idea for these state and federal agencies to be involved with Technical Committee

Additional Streams/Tributaries Not Delineated in Upper Tonawanda and Oatka Creek Watershed in Genesee and Wyoming County - Committee decided to only do flood mitigation plan for areas in delineated watersheds.

Oatka Creek - George Squires distributed copies of the Oatka Creek State of the Basin Report and indicated that Oatka Creek would be doing public meetings in support of the State of the Basin Report and the Joint Flood Mitigation Plan project.

Action Items

Finalize survey as per comments at meeting and any additional comment that come in by 1/31/03
Do final location of critical facilities that are going to be point located
Set up meeting with additional county contacts
Set up meeting with NYSDEC and ACE contacts
Finalize municipal participation and resolutions by first week in February
Develop survey cover letter and put on County EMO stationary
Send out survey after municipal participation is finalized
Set up municipal contact interviews for information and data collection
Invite NYSDEC, ACE, and SEMO representative to join Technical Committee

Next Meeting: February 25, 2003 at Attica Village Hall/Fire Hall

**Tonawanda and Oatka Creek Watersheds
Municipal Flood Mitigation Planning
Technical Committee
Meeting Minutes
February 25, 2003**

**Attica Fire Hall
Attica Village Offices
9 Water Street
Attica, NY 14011**

Present: Frances Tucker, Genesee County Soil & Water Conservation District (SWCD), James Duval, Genesee County Planning, Felipe Oltremari, Genesee County Planning, Tom Skoglund, Wyoming County Planning, Dave Reckahn, Wyoming County SWCD, Roger Lander, Genesee County Emergency Management, Jim Reger, Wyoming County Emergency Management, Fran Reese, Lu Engineers, David Zorn, G/FLRPC, James Mallory, Town of Pembroke, Dan Kelsey, Town of Alexander, Thomas Lowe, Town of Alaxander, William Gick, Town of Bethany, Len Walker, City of Batavia, Neil Kingdon, Town of Pavilion, Douglas A. Post, Village of Attica, John W. Hurst, Town of Middlebury, Gene Sinclair, Town/Village of LeRoy, John Strathearn, Town of Pavilion, Roger Becker, Town of Orangeville, Thomas Douglas, Town of Bethany, James Stan, Town of Pavilion, William Hirsch, Town of Alexander, William Wagner, Village of Alexander, Mike Kehl, Town of Sheldon, Jason Haremza, G/FLRPC.

Introductions

Distribution of January 28, 2003 meeting minutes

Project Updates

Additional county meetings held (DOH, Highway Supt, Historian, Enforcement)

Information and data collection

Survey distribution

Mapping

Revised Floodplains

County Issues

Parcels/centroids

Digital orthophotos

Slope and elevation

Surface water

Critical facilities

Web Site - has been set up at www.co.genesee.ny.us, click on What's Happening

Technical Committee Summary Reports

Maps

Oatka Creek Watershed Committee contact has been made - public meetings in the Oatka Creek Watershed for the Flood Mitigation Plan will be held in association with the Oatka Creek Watershed Management Plan public meetings.

Municipal interviews

Finalized process based on Technical Committee input

Interviews

Initial interview with City of Batavia has been done

Scheduled additional interviews at Technical Committee meeting

Will need to have all municipal interviews complete by the end of March/beginning of April

Upcoming

Municipal Interviews

NYSDEC and ACE Interviews

Survey follow-up and tabulation

Finalize dam inventory

Analysis of municipal regulation in the flood zone

Analyze land use in flood zone

Historical - floods, changes in stream

Description of known flood hazards - source, streambank erosion

Public Outreach

News article/release

Batavia Daily News (Roger Mulick)

County Currier

PennySavers - meeting notice (Roger Lander and Jim Reger will post)

Drummer

D&C (John Kohlstrand)

Buffalo News

Hold meetings in early April

Oatka Creek Watershed Meetings - LeRoy, Pavilion, and Warsaw in association with the Oatka Creek Watershed public outreach.

Tonawanda Creek Watershed - Alexander Recreation Hall

In notice ask people to bring significant information they have about flooding to public meeting.

Action Items

Get another map for web site to Felipe Oltremari

Schedule and hold remaining municipal interviews

Public meeting - locations, dates, news release/notice

Next Meeting: March 25, 2003 at Attica Village Hall/Fire Hall

**Tonawanda and Oatka Creek Watersheds
Municipal Flood Mitigation Planning
Technical Committee
Meeting Minutes
March 25, 2003**

**Attica Fire Hall
Attica Village Offices
9 Water Street
Attica, NY 14011**

Present: George Squires, Genesee County Soil & Water Conservation District (SWCD), James Duval, Genesee County Planning, Felipe Oltremari, Genesee County Planning, Tom Skoglund, Wyoming County Planning, Dave Reckahn, Wyoming County SWCD, Roger Lander, Genesee County Emergency Management, Jim Reger, Wyoming County Emergency Management, Fran Reese, Lu Engineers, David Zorn, G/FLRPC, James Mallory, Town of Pembroke, Thomas Lowe, Town of Alaxander, William Gick, Town of Bethany, Neil Kingdon, Town of Pavilion, Douglas A. Post, Village of Attica, John W. Hurst, Town of Middlebury, John Strathearn, Town of Pavilion, William Hirsch, Town of Alexander, Mike Kehl, Town of Sheldon, Rodney Cook, Town of Batavia, Don Beardslee, Village of Wyoming, Harold Bush, Town of Gainsville, Jason Haremza, G/FLRPC.

Introductions

Project Updates

Interviews

State - David Zorn reported on completed interviews with NYSDEC, will follow-up with Dam Safety Division

County - David Zorn reported on completed interviews with Planning, SWCD, Emergency Management, Highway Superintendent, Historian, Health Department, Enforcement (Wyoming)

Municipal - Jason Haremza reported on completed interviews, scheduled interviews, and interviews that need to be scheduled for March or early April (see enclosed Municipal Interview Schedule)

Information and data collection

Historical - David Zorn reported on progress of newspaper search from the 1800's through present.

Survey

Initial responses - David Zorn reported on status of survey (see attached Flood Survey Status).

Roger Lander asked that a list of those who have responded thus far be provided.

Follow-up - David Zorn reported that 2,341 reminder post cards have been sent.

Roger Lander asked that a news release be done on surveys

Additional survey forms - Jim Duval asked that additional surveys be available at the upcoming public meetings.

Public Meetings - David Zorn reported that preparation for the upcoming public meetings has been underway (see attached Joint Flood Presentation). Jim Duval asked that the flyer announcing the public meetings be emailed to Technical Committee.

Prioritization Criteria for Site Hazard Evaluation - Fran Reese explained the draft Evaluation form. She pointed out that it will be used to identify priority sites for further study and urgent need of mitigation. (An updated version of the form is attached based on recommendations at meeting)

Municipal Contacts and Resolutions

As of this meeting all municipalities have municipal contacts and all Genesee County municipalities have municipal resolutions. Felipe Oltremari requested that there be a Town of Stafford contact.

Public Outreach

Information on public meetings distributed at meeting (attached)

Action Items

Update Prioritization Criteria for Site Hazard Evaluation (update attached)

Email list of those returning surveys (emailed 3/25/03)

Bring extra surveys to public meetings

News release regarding surveys for Batavia Daily (sent to Jim Duval on 3/25/03)

Check Stafford contact

New digital ortho-photos - Genesee and Wyoming County Planning will send to G/FLRPC

Next Meeting: April 22, 2003, 10 am at Attica Village Hall/Fire Hall

**Tonawanda and Oatka Creek Watersheds
Municipal Flood Mitigation Planning
Technical Committee
Meeting Minutes
April 22, 2003**

**Attica Fire Hall
Attica Village Offices
9 Water Street
Attica, NY 14011**

Present: George Squires, Genesee County Soil & Water Conservation District (SWCD), James Duval, Genesee County Planning, Felipe Oltremari, Genesee County Planning, Jim Reger, Wyoming County Emergency Management, Fran Reese, Lu Engineers, David Zorn, G/FLRPC, William Gick, Town of Bethany, John W. Hurst, Town of Middlebury, Don Beardslee, Village of Wyoming, Jason Haremza, G/FLRPC, Linda Logan and Mardell Sundown, Tonawanda Seneca Nation, Jerry Davis, Town of Covington, Gene Sinclair, Town and Village of LeRoy, Len Walker, City of Batavia, William Wagner, Village of Alexander, Henry Hooper, Town of Darien, Jerome Smith, Town of Warsaw, Dale Slocum, Town of Attica.

Introductions

Project Updates

Interviews

State

County

Municipal - still trying to schedule Stafford and Alabama

Information and data collection

Historical - completed

Survey

Initial responses and follow-up completed

Additional survey forms - handed out at public meetings

Technical Committee was asked to follow-up with property owners in community so that more surveys could be sent back.

Web Site

Technical Committee Summary Reports

Maps

Public Meetings - completed four public meetings

Prioritization Criteria for Site Hazard Evaluation

Risk Assessment

Fran Reese and Jason Haremza reported on the initial Risk Assessment citing the following issues: streambank erosion, debris, relocation of affected structures, culvert maintenance and sizing, development in flood zones, dam maintenance.

Final Prioritization Criteria for Site Hazard Evaluation

Fran Reese reviewed the revised Prioritization Criteria for Site Hazard Evaluation and the list of sites in Genesee and Wyoming County (**enclosed if not at meeting**). She pointed out additions will be made to the list as municipal interviews are finalized.

Flood Mitigation Goals and Objectives

David Zorn handed out the original goals and objectives and asked for them to be reviewed for the May meeting when draft goals and objectives will have to be set for the plans.

Action Items

Survey follow-up

Check with NYSDEC on municipal participation in NFIP

Finalize Prioritization Criteria and develop list of priority sites

Review goals and objectives

Next Meeting: May 27, 2003, 10 am at Attica Village Hall/Fire Hall

**Tonawanda and Oatka Creek Watersheds
Municipal Flood Mitigation Planning
Technical Committee
Meeting Minutes
May 27, 2003**

**Attica Fire Hall
Attica Village Offices
9 Water Street
Attica, NY 14011**

Present: George Squires, Genesee County Soil & Water Conservation District (SWCD), James Duval, Genesee County Planning, Felipe Oltremari, Genesee County Planning, David Zorn, G/FLRPC, William Gick, Town of Bethany, John W. Hurst, Town of Middlebury, Len Walker, City of Batavia, Jerome Smith, Town of Warsaw, John Strathearn, Town of Pavilion, Thomas Douglas, Town of Bethany, Roger Lander, Genesee County Emergency Management Office, Tom Skoglund, Wyoming County Planning, Dave Reckahn, Wyoming County Soil & Water Conservation District, Lou Gayton, Town of Bethany.

Introductions

Project Updates

Interviews - Complete

Information and data collection - Historical inventory complete and cataloged

Survey - complete.

Recommended sites for further detailed evaluation - draft recommendations complete

Dam Inventory - George Squires pointed out that one dam was listed as being in Genesee County but in the Town of Orangeville. George was going to follow-up on the location of the dam.

Priority Sites

All sites were reviewed with the following comments:

Genesee County

522 - Russ Hand is the owner of the corner parcel where Oatka Creek makes right turn. George Squires is checking on permits for him. While research is done on this area please contact George Squires for up-to-date- details on what is going on with that parcel.

104.01 is in the TOWN of Alexander

112.02 - the trailer park west of West End is called Batavia Mobil Home Park

113 should read SOUTH Main St.

110.02 is called the Bureau of Maint.

110 - no one could recall anytime this building has been flooded but there is a beaver dam problem in this area that continues to back water up to wetland in close proximity.

Talk to Len Walker about including City of Batavia Fire HQ in priority sites

Check on Genesee County Court Facility and 3 W Main building - see if in or out of floodplain

if one of the two sites above are in the floodplain and have been flooded it was felt that they are more important then #124

Wyoming County

144 serves the Village of Attica but it is in Genesee County.

542 - spreading of manure in the floodplain should be considered. One recommendation for the report would be to do a Wellhead Protection Plan, which could get at the issue of such things as spreading manure in the wellhead protection zones.

531 is now called Francis Herrmann Trailer Park (not Schoff). Jerome Smith does not feel trailer park is in floodplain but others remembered that it did need to be sandbagged in the past

558 - In answer to the question in the comment column this site should not be listed as a critical facility in that it is not the official town hall and it is not owned by the Village.

526.02 - The WTP is at the same location (adjacent)

547 - Jerome did not feel that this was an issue

188 - the DEC permit should be checked

Both counties wanted until the end of this week -5/30- to review the prioritization list

Surveys Analysis

Sample analysis was distributed and the full analysis will be made available when completed by county, municipality and watershed.

Flood Mitigation Plan Goals and Objectives

David Zorn asked that any input on the goals and objective be sent to him in the next week.

Distribution of Draft Sections

David Zorn pointed out that draft sections of the reports for review would be available by the next Technical Committee meeting

Other

There will be a meeting on June 9, 2003 at 9:00 in the Genesee County Planning Conference room to discuss the NYSDEC permitting process with regard to flooding issues and practices

Action Items

Input on priority sites by May 30, 2003

Get out survey analysis by type of survey and county, municipality and watershed

Input on Flood Mitigation Plan Goals and Objectives by May 30, 2003

Next Meeting: June 24, 2003, 10 am at Attica Village Hall/Fire Hall

**Tonawanda and Oatka Creek Watersheds
Municipal Flood Mitigation Planning
Technical Committee
Meeting Minutes
June 24, 2003**

**Attica Fire Hall
Attica Village Offices
9 Water Street
Attica, NY 14011**

Present: George Squires, Genesee County Soil & Water Conservation District (SWCD), James Duval, Genesee County Planning, Felipe Oltremari, Genesee County Planning, David Zorn, G/FLRPC, William Gick, Town of Bethany, John W. Hurst, Town of Middlebury, Len Walker, City of Batavia, Jerome Smith, Town of Warsaw, Roger Lander, Genesee County Emergency Management Office, Dave Reckahn, Wyoming County Soil & Water Conservation District, Fran Reese, LU Engineers, Devon Lay, Wyoming County Soil & Water Conservation District, Neil Kingdon, Town of Pavilion, Thomas Lowe, Town of Alexander, Gene Sinclair, Town of LeRoy, Mardell Sundown, Tonawanda Seneca Nation, Linda Logan, Tonawanda Seneca Nation, Jerry Diskin, Genesee County EMO, Douglas Post, Village of Attica, James Reger, Wyoming County Emergency Management Office, Jason Haremza, G/FLRPC

Introductions

Project Updates

Permitting Meeting with NYSDEC ([minutes enclosed](#)). Discussion on debris removal included the following:

In many cases removal is the responsibility of the property owner

There is some 404 funding available but there was questions on how it was going to be distributed.

There was a question on county cooperation on sharing of equipment

An inventory needs to be done (Genesee and Wyoming County are working on)

Find out property owners - see if an easement can be obtained

Use local newspapers to get out the word - need sample article

SEQRA review

Survey Analysis (see draft report)

Priority Sites

Final priority sites listed in draft report. Historical photos are being scanned and analysis underway.

Distribution of Draft Sections

Draft sections of Chapters 1 through 4 were distributed. It was decided that comments were due back to G/FLRPC by July 4, 2003.

Discussion of Flood Mitigation Action Steps

Use Genesee County ArcIMS system to get data. In Wyoming County maps are available from county agencies.

Structural damage - add section on safety hazards and loss of life and property including warning system, how to get word out, reference to County Emergency Management Plan, and repetitive loss.

Floodplain development - discussion included retrofitting, Stormwater Phase II guidelines, local land use regulation and control, and building permit checklist

Public Meetings

Consensus was to schedule the meetings in Pavilion and Attica (Jim Reger will check on school) but do not schedule in week of August 10.

Action Items

Follow up on 404 funding

Comments on draft sections by July 4, 2003

Check on availability of Attica school for public meeting - Jim Reger

Next Meeting: July 22, 2003, 10 am at Attica Village Hall/Fire Hall

**Tonawanda and Oatka Creek Watersheds
Municipal Flood Mitigation Planning
Technical Committee
Meeting Minutes
July 22, 2003**

**Attica Fire Hall
Attica Village Offices
9 Water Street
Attica, NY 14011**

Present: George Squires, Genesee County Soil & Water Conservation District (SWCD), Felipe Oltremari, Genesee County Planning, David Zorn, G/FLRPC, William Gick, Town of Bethany, Len Walker, City of Batavia, Jerome Smith, Town of Warsaw, Dave Reckahn, Wyoming County Soil & Water Conservation District, Fran Reese, LU Engineers, Neil Kingdon, Town of Pavilion, Gene Sinclair, Town of LeRoy, Jason Haremza, G/FLRPC, Jerry Davis, Town of Covington, Tom Skoglund, Wyoming County Economic Development and Planning, Mike Kehl, Town of Sheldon

Introductions

Additions to the Agenda

Army Corps of Engineers flood study of Tonawanda Creek Watershed - George Squires handed out a press release entitled, "House approves Reynolds'\$100,000 request for Tonawanda Creek Watershed, Army Corps of Engineers authorized to study in order to stop flooding, aid environment". George stated that he had no other information on this project but that he would attempt to coordinate with ACE.

Project Updates

Fran Reese followed up on the Hazard Mitigation funding that was talked about at the last Planning Committee meeting by Roger Lander. She said she attended a pre-proposal meeting with Roger and felt that some funding was available and that Genesee County was going to apply. She pointed out that letters of intent to file a proposal must be in by August 8, 2003 and any questions on the content of the Genesee County proposal should be directed to Roger Lander.

Distribution of Draft Sections

The second revision of the draft report was distributed and discussed. The following timeline was agreed upon:

Comments on the second revision should be received by G/FLRPC by August 1, 2003
A copy of the full draft will be distributed to the Planning Committee on August 12, 2003
A comments on the full draft should be received by G/FLRPC by August 22, 2003
The final draft will be discussed at the August 26, 2003 Planning Committee meeting

Public Meetings

Consensus was to schedule the meetings in Pavilion (Town Hall - August 21) and Attica (school - August 19).

Action Items

Review and supply input to draft report

Municipalities sign and return authorization letters to release NFIP data to G/FLRPC

Next Meeting: August 26, 2003, 10 am at Attica Village Hall/Fire Hall

**Tonawanda and Oatka Creek Watersheds
Municipal Flood Mitigation Planning
Technical Committee
Meeting Minutes
August 26, 2003**

**Attica Fire Hall
Attica Village Offices
9 Water Street
Attica, NY 14011**

Present: Thomas Lowe, Town of Alexander, William Gick, Town of Bethany, Jim Duval, Genesee County Planning, Felipe Oltremari, Genesee County Planning, Douglas Post, Village of Attica, Jim Reger, Wyoming County Emergency Services, Jerome Smith, Town of Warsaw, Dave Reckahn, Wyoming County SWCD, Fran Reese, Lu Engineers, Jason Haremza, G/FLRPC, Dave Zorn, G/FLRPC, George Squires, Genesee County SWCD, Roger Lander, Genesee County Emergency Services

Introductions

Development of Executive Summary

It was felt that the report Executive Summary should include an introduction to the project, priority issues, priority recommendations, goals, objectives and benefits, and narrative on the need for municipal adoption and the concept of an All-Hazard Mitigation Plan. It was agreed that the first draft of the Executive Summary would be emailed to the Planning Committee for comment.

Final Draft Reports

Municipal final draft reports were distributed. County final draft reports were distributed to the County Emergency Management Office, County Planning, and County Soil & Water Conservation District the week of August 18, 2003. It was noted that the final draft should be used for adoption. After adoption a final version will be sent out with the adoption resolution and any corrections noted.

Action Items

Adopt final draft reports

Final reports - G/FLRPC will send one to the municipality and two to County Emergency Management

Jason Haremza will send both public meeting presentations to County Emergency Management

A draft resolution for adoption of the Plan will be sent to the municipalities

Check on SEQRA in relation to approval of Plans

Putting reports on Wyoming County web site - Jim Reger will followup with David Zorn

Appendix C – Municipal Interviews

Requested Participants, Resources, and Standard Questions

Participants:

- Lead as named by City/Town/Village
- Public Works Director
- Highway Superintendent
- Planner
- Zoning officer
- Code Enforcement Officer
- Building Inspector
- Watershed Inspector
- Clerk
- Historian
- Fire Chief/Marshal

Resources:

- Any flood studies or reports for the municipality
- Any flood maps
- Any municipal ordinances that deal specifically with waterways, floods, or land use in or near floodplains
- Pictures or records of past and historical flood events, including pictures of any damage

Questions:

1. Does your community participate in the National Flood Insurance Program (NFIP)?
2. What is the history of flooding along Oatka/Tonawanda/[name of tributary creek] in your community? Please show the limits or extent of flooding on this map, if possible.
3. Do you have any critical facilities located in areas of flooding? Examples: Highway Garage, police station, hospital, school, day care facility, senior center, senior living facility, nursing home, wells/water treatment plant, sewage treatment plant. Have list of mapped/listed critical facilities available.
4. Do you have any structures or infrastructure that has sustained damage from flooding? Do you have cost estimates or actual repair costs on these facilities? Examples: roads, bridges, pipelines, buildings

5. What protective/preventive measures have you taken to protect critical facilities from flooding? What measures would you like to see in the short and long term?
6. Have you experienced erosion problems along the streambanks in your community? Where are the main problem areas? Are any buildings, roads or infrastructure in immediate danger?
7. Do you have special permitted uses in flood prone areas? If so, what are they?
8. Do you have a flood damage prevention ordinance in your community? If so, how is it used or implemented? Who evaluates proposed development in flood prone areas?
9. Do you have a policy on stormwater management for new development in your community? What are the procedures? Who evaluates this?
10. Do you have Flood Insurance Rate Maps (FIRM) available in your community? Who keeps them? Do you use them when reviewing proposals for new development?
11. Do you have any information available on flood damage records for private structures (homes, businesses, etc.)? How is this information kept? Does the building inspector or code enforcement officer inspect properties that have been damaged by flooding before re-occupancy?
12. Do you have a community policy on rebuilding in flood prone areas?
13. Do you have a trained floodplain administrator?
- 14.** Do you have dams or flood structures? If so who maintains these?

Appendix D – Public Information Meetings

First Public Information Meetings

Issues

- Debris clearing vs. habitat disruption
 - Creek filling in
 - Eliminate log jams and sand bars
 - Permit issue
 - Land owner approval and/or cooperation
 - Clear tributaries first
 - Who is responsible for removal
 - Who would pay for debris removal
 - Ice jamming in areas of high debris
 - Opening channels upstream will cause more problems downstream (start downstream)
 - Liability of municipalities in maintenance of streams
 - Individuals who do not have equipment - getting assistance
- Streambank erosion and restoration
 - Slow creek flow with natural structures
- Siltation
- Culvert maintenance
 - Notably DOT
 - Route 19
 - Route 19 reconstruction in Wyoming County - culverts to handle increased runoff
- Dams
 - Create more problems in some areas
- Beaver dams - rechannel natural flow
 - Permit issue
 - Land owner approval and/or cooperation
- Education and awareness - need more
- Tributaries
 - Major causes of flooding
 - Identify to slow and alleviate flooding
 - Pearl and Oatka Creek junction recently cleared and improvement seen
- Increased impervious surface
 - Flooding issues of open land vs. impervious surface
- Creek straightening
- Perception that flooding is occurring more lately
- Flooding causing more damage than any other natural disaster in NYS
- Need buffer zones between creek and structures
- What is the Army Corps' role

Appendix E - Prioritization Criteria for Site Hazard Evaluation Methodology

All sites were ranked according to the following methodology:

Rank	Criteria	Yes	No	Previously repaired or mitigated (Y/N)	Does previous mitigation require repair?
16	Critical facilities affected by flooding or streambank erosion				
15	Critical facilities threatened by flooding or streambank erosion				
14	Residences affected by flooding or stream bank erosion				
13	Residences threatened by flooding or stream bank erosion				
12	Industrial structure affected by flooding or stream bank erosion				
11	Industrial structure threatened by flooding or stream bank erosion				
10	Agri-business structure affected by flooding or stream bank erosion				
9	Agri-business structure threatened by flooding or stream bank erosion				
8	Commercial structure affected by flooding or stream bank erosion				
7	Commercial structure threatened by flooding or stream bank erosion				
6	Road/bridge affected by flooding or stream bank erosion				
5	Road/bridge threatened by flooding or stream bank erosion				
4	Infrastructure affected by flooding or stream bank erosion				
3	Infrastructure threatened by flooding or stream bank erosion				
2	Property (not structures) affected by flooding or stream bank erosion				
1	Property (not structures) threatened by flooding or stream bank erosion				

Each site then received a total score. Ranked sites were then provided to the Planning Committee for review and input. Priority sites for further investigation are based on both the quantitative ranking and the qualitative review by the Planning Committee.

Appendix F – Residential/Agricultural & Commercial/Industrial Surveys

Flood Survey Results by County, Municipality & Watershed

		Total Parcels (in Buffer Zone)	Ag/Undev/Mixed			Commercial/Ind			Residential			Total		
			Surveys Sent	Surveys Delivered	Res- ponses	Surveys Sent	Surveys Delivered	Res- ponses	Surveys Sent	Surveys Delivered	Res- ponses	Surveys Sent	Surveys Delivered	Res- ponses
Genesee County		3,541	53	47	20	338	243	78	2,485	2,071	702	2,876	2,361	800
Batavia (C)		1,901	0	0	0	231	164	56	1,468	1,202	386	1,699	1,366	442
Alabama		16	0	0	0	1	1	1	6	3	1	7	4	2
Alexander		215	17	15	9	4	3	1	102	91	29	123	109	39
Batavia		405	9	6	2	39	27	4	252	213	70	300	246	76
*Bethany		83	5	6	1	0	0	0	54	48	20	59	54	21
Darien		9	0	0	0	0	0	0	7	6	2	7	6	2
LeRoy		197	9	8	2	4	4	2	131	126	51	144	138	55
Pavilion		136	6	7	4	9	8	4	66	59	21	81	74	29
Pembroke		206	6	4	1	12	6	2	139	106	35	157	116	38
Stafford		17	0	0	0	0	0	0	13	11	3	13	11	3
Alexander (V)		53	1	1	1	6	4	0	28	25	16	35	30	17
Attica (V)		15	0	0	0	3	3	0	0	0	0	3	3	0
LeRoy (V)		288	0	0	0	29	23	8	219	181	68	248	204	76
Wyoming County		1,394	21	20	6	98	73	30	889	782	283	1,008	875	319
Attica		93	2	2	2	7	7	2	51	47	21	60	56	25
Bennington		79	2	2	1	0	0	0	31	28	8	33	30	9
Covington		102	4	4	2	2	1	1	68	67	25	74	72	28
Gainesville		57	1	1	0	7	2	0	37	31	10	45	34	10
Java		33	1	0	0	1	1	1	16	13	3	18	14	4
Middlebury		36	3	3	1	0	0	0	7	7	2	10	10	3
Orangeville		104	3	3	0	1	0	0	56	53	21	60	56	21
Sheldon		123	2	2	0	3	3	2	81	77	30	86	82	32
Warsaw		106	2	2	0	8	6	1	60	54	20	70	62	21
Attica (V)		314	1	1	0	33	27	13	233	202	73	267	230	86
Warsaw (V)		264	0	0	0	29	19	9	197	156	56	226	175	65
Wyoming (V)		83	0	0	0	7	7	1	52	47	14	59	54	15
Tonawanda		3,639	48	41	17	341	246	82	2,520	2,111	714	2,909	2,398	813
Oatka		1,296	26	26	9	95	70	26	854	742	271	975	838	306
Totals		4,935	74	67	26	436	316	108	3,374	2,853	985	3,884	3,236	1,119

* The Town of Bethany was the only Municipality to have parcels in both the Tonawanda and Oatka Creek Watersheds.

The only survey response was in the Oatka Creek Watershed, indicating that no flooding has occurred.

Flood Damage Survey - Comments

Agricultural / Undeveloped / Mixed Use

ID #	Comment
1950	Wolfley Farms works over 100 acres of cropland in the Tonawanda Creek Watershed or flood plain. The biggest problem with frequent flooding is the Tonawanda Creek is filled in numerous places with logjams, which hold back the flow of water and causes frequent flooding. Logjams should be removed to give the Tonawanda more capacity to handle the water flow. – Willard Wolfley
2066	We become stuck in or out when <u>all</u> roads to home have road-closed signs and/or flood water across the road.

Commercial / Industrial

ID #	Comment
1881	In response to your survey questionnaire, the following information may be relevant. Chapin Manufacturing owns 126 acres of land, 80 acres in the Town of Batavia, and 40+ acres in the City. A large portion of the property is a State and Federal Regulated Wetlands that drains to the Celery Creek to the Tonawanda. The Creek is in the very far South corner of the property. In the past 5 years, flooding has occurred in areas North of the Niagara Mohawk Easement that were previously not wet. The cause of the flooding is not known but several factors may have contributed: <ul style="list-style-type: none"> - A local company discharges 500,000 to 700,000 gallons a day into a DOT easement onto Chapin property. Chapin is working with Dave Lange, DOT on several problems with the easement and flooding that is occurring in this area. Additional problems have been generated by this constant flow of water in attracting Beavers to the area. Several areas have been flooded, and some animals have been removed under a DEC nuisance permit. - I have spoken with Roger Lander about this survey; please contact him or myself (585) 343-3140 x3033 for further information.
4085	At our expense, we dug up our basement floor to set tile in the foundation and installed a sump pump. We also dug up the property to install tile in the ground and upgraded our gutter system. The greatest difficulty has been our frustration obtaining assistance – even insurance. Since our major work however, we've not had the same flooding difficulties.

Residential (Genesee County)

ID #	Comment
431	1941 Batavia Flood affected homes on Ganson Avenue, when the curve on Ganson Ave. was an open field. Since then St. has been extended and storm drains added. In 1989 the City of Batavia re-paved and redid storm drains. Area #2: Land mass between Ganson and Morton Ave has had flooding problem. A manhole in this area was covered with soil and disconnected (according to the city of Batavia). If cleaned out &

	re-connected flooding between these streets would be alleviated. Issue with mandated flood insurance: Suggestion- Ganson Ave. hasn't seen flooding since improvements to drainage and installation of discharge gate, please include renaming of the flood zone in Batavia. Why is my NFI rate \$577/yr for \$65,000 coverage and my brother's \$301/yr for \$284,000 in NC. Day phone: 344-0055, home: 716-308-2009.
501	Tonawanda flow obstructed by fallen trees, sedimentary erosion, and other natural debris. Deepening channel in shallow spots may be necessary since so much silt has been deposited filling in the basin. Grew up on Creek Road near "Whiskey Run" and saw it flood regularly.
922	Flood Insurance: Program is overpriced, coverage is poor, & deductibles are too high. People who have had to use flood insurance have complained about poor settlements and attempts to avoid paying. NFIP needs to be revisited. Flooding Remedies: Clean brush and trees from banks. Clear and deepen channel. Monitor yearly maintenance of channels and banks.
1472	We have lived at 160 Jackson St. for 33 years and have never seen flooding. We would like to know who determined our property and when this was done. We believe Insurance Companies are trying to get rich off of people who don't really need flood insurance. Ann Brzezniak 334-0126.
2308	Several years ago I sat on the Tonawanda Watershed Advisory Committee and creek clean up was an issue we discussed. However, instead of the much-needed removal of logjams south of the city, the advisory council organized a "clean-up" of stretch that flows under the Rt. 98 bridge as well as just upstream and downstream from the bridge. Why not remove logjams from Rt. 20 all the way to the WBTA radio tower on Creek Road? Wouldn't this speed the flow of water through the area?
1534	61 years ago, the Tonawanda creek overflowed its banks and reached South Liberty Street forcing residents to leave homes in rowboats. Hasn't happened again in past 53 years I've lived here. For past 19 years I've lived on Liberty St. I've had to pay \$500/yr in flood insurance, which only covers structure/foundation, not contents or appliances in basement. I'd rather take the risk of flooding than pay the insurance premium. I feel nobody should be forced to pay for flood insurance.
1572	Recent changes on Law St in Batavia have helped alleviate flooding across the street. One area of concern I see is flooding at Kibbee Park. Also, I do not agree that I should be required to carry flood insurance by the bank. In the 30 years I have lived at 114 S. Swan St in Batavia, I have not been aware of any floodwaters in this area. The flood zone should be revised.
1248	I was an original member of the Tonawanda Creek Watershed Committee and after months of study, I made a motion which was passed by the committee to proceed with the Upper Tonawanda (just S of City of Batavia) for a flood control project. This project was to control flooding by retention ponds to release the water in a timely manner into the creek to prevent flooding. Unfortunately during President Reagan's term cutback were made in programs that would have funded this project. Town of Amherst would have benefited the most and should have born the greatest burden for maintenance.
1018	My neighbor has lived on his property for 50 years and has never seen the Tonawanda Creek cross the road. He said the Army Corp of Engineers redesigned it years ago so it wouldn't flood. I live on the South side of south Main Street at Eastern end, I've only

	seen yards flooded on the North side of the Street on the Western end. I pay \$500/yr unwillingly for flood insurance (mandatory by mortgage).
2779	The Oatka Creek is full up to banks every Spring thaw (occasionally overflows banks) preventing drainage tributary from releasing into the Oatka. Flood waters back up and 10+ acres of farmland. In LeRoy, the problem has worsened over past few years as the village and Town have approved more development and parking lots (more roofs and landcover).
1100	Although the Tonawanda Creek has not flooded our property since we've owned it, flooding is a concern of ours as the creek rises every Spring. The Tonawanda did flood this property and most of the South side of Batavia in the 1940's before the creek bed was widened and deepened.
2249	I owned the nursery and greenhouse during the devastating floods of 1959-60. This flooding occurred after flood control work was done by the city of Batavia. I decided to close the business as a result of the flooding. My daughter and son have since reactivated the business and made some flood prepared changes. We now have gas heating and are able to elevate the units. Also ice jams are no longer an issue b/c the city's wastewater deposits warm water in the creek. I believe those who defeated the building of a flood control dam south of the city did the area.
429	Flood insurance is worthless in the city of Batavia b/c it isn't valid unless the whole city is declared in a state of emergency. My street & house may be flooded, but unless there is an SOE insurance would be of no use. Flooding in the city kept to a minimum since the widening of the creek plus pump stations run by the city. Hasn't been a flood in the city of Batavia since early 40's.
1024	Since house was built in 1898 no flooding damage has occurred. During 100-yr. flood peak, water was still 175' from house. I find it ridiculous that I must pay \$547/yr in flood insurance. Flood zone needs to be adjusted.
3001	Built house in 1989 knowing that could be in flood zone we built it on top of a hill. Army Corp flood maps show we were in flood zone so we hired a surveyor to map elevations. Report is attached. First floor elevation of new home: 862.5' Top bank of Tonawanda Creek: 848.4' (difference 14.1')
2071	We live directly on the Attica-Alexander boarder just South of Attica 2000' from Tonawanda, but 300' from inlet that feeds into it and floods our yard every year. We are having problems with our septic system due to the flooding. Flooding increased after a bridge going under Genesee St was made smaller.
2384	Concern with floodwater at 9557 Creek Rd in Bethany: We have well water at our house and are concerned with water quality during flooding b/c of local farming. Also concern with nearby culvert being blocked during spring flooding.
747	Serious problem with flood control dike on Jackson Ave in city of Batavia. This cement dike is undermined at its base. City is aware but has done nothing. For more info. about this problem contact RJ Smith (585) 345-6350.
2187	Old mill dam behind E. Pembroke Fire Dept needs to be removed. No longer of any use. It backs up water into Bowen Creek onto my property. If removed it would allow water to flow faster and lower level of Bowen Creek. Tonawanda Creek needs cleanup countywide. Trees and brush needs to be removed.
385	Drainage ditch in yard about 4' wide turns into lake during flooding. I believe a dam between Batavia and Alexander should have been built on the Tonawanda about 30

	years ago.
1122	Tonawanda Creek concerns in City of Batavia: South side of Creek near Walnut St pedestrian bridge needs stone work done to bank like North Side. Ice jams cause water to back up every Spring. My backyard is slowly sliding into the creek. Original fence posts are 4 to 6' down the sloop. Garage has broken cement pad on North side and leans to the North.
20	Flash flooding in Batavia: stormwater drainage ends up at our end immediately adjacent to Main St (RT 5) and directly in front of our house. Problem began with increase of commercial development on west side of Batavia and indicates that there is not adequate drainage in our immediate vicinity.
1038	See attached Flood/Elevation survey of 2-4 Davis Ave. in Batavia: First floor elevation is 3.1' above base flood elevation of 889.5'
1079	Our house has never been flooded, but many years it has come close. Every year we worry it could be the year our house does get flooded. I will be glad to see a Flood Mitigation Project for the Tonawanda Creek.
1152	Concern with accuracy of being in flood zone: Attached is fax from City of Batavia showing tax parcels and 100Yr flood zone.
2771	Oatka Tributary crosses under Rt 19 into Rusk's fields between their greenhouses and 8547 Lake St Rd. making land unusable until water leaves.
1904	Storm sewer under Rt. 98 in Alexander needs to be replaced. Tonawanda Creek needs to be cleaned out.
157	In my opinion, you cannot control mother nature. Making costly changes to the environment would only have higher maintenance costs in the future. We moved here knowing the risk and with that the Tonawanda near me is left just the way it is. Previous homeowner built the house in 1900 and only recalled one flood since.
17	Flooding is always a concern here in the area every Spring. The City of Batavia has made drainage improvements and we recently purchased a generator for emergency pumping in case of power outage. We have been fortunate through the history of flooding nearby.
2748	Marked location on Oatka Creek in LeRoy where removed many large boulders and tried to change the flow at a bend in the creek. Area of lime pit mining where creek overflows in wet years. Creek needs to be cleaned out, increasing its depth.
2086	Tonawanda Creek should be dredged from Batavia to East Pembroke to allow more water to be held within its banks and provide more opportunities for recreational uses. Removing trees, garbage and other debris would help increase rate of flow.
18	Main and Redfield intersection in Batavia floods every time there are heavy rains. Water spreads across Redfield as it goes down the street.
1607	They built a new dyke years ago to prevent floods in this area. Why must I still have flood insurance?
2162	Floodwaters have come up to our house, but not inside 3 times in past 8 years. We are slightly more elevated than our neighbors. We were asked to leave our house in Jan 1998 but stayed and were fine. We feel there is a great need for flood control. Given the right conditions (melting snow pack + rain) we are in danger of a disaster. Other concern: our neighbor's gray water leaches into the Tonawanda.
2304	Our property floods each spring and after heavy rains due to water backing up in drainage ditch across the road from the Tonawanda and poor drainage in back yard. No

	history of structural damage, but water gets 2' deep in yard.
2431	For many years there was an "S" curve to the creek on my property. Over the years, flooding has completely straightened out the curve and as a result each spring the waters rush by rapidly causing erosion of my land and higher water on the land itself.
2532	Concerned with: 1) Silt build up behind dam on Munson St. 2) Erosion of bank on East side of Oatka on Wolcott St - vicinity of school 3) Condition of retaining walls on West side of Oatka, below Post Office and Falls on North side of Main St. bridge.
2230	Ice Jam at Brushville Bridge caused flood in 1959. After 1959, we built a dyke along the bank to prevent future flooding. Ice jams would be prevented if trees and other debris along the banks were cleared out as they did to the West City line. Most years we get some "surface water" but don't see damage.
122	Only flood in area over past 70 years was in 1942. In 25 years I have lived at 136 S. Main in Batavia water has only come 25' into my yard. At \$500/Yr NFI is a waste of money.
2935	I am strongly opposed to any project that would alter the natural flow of the Tonawanda. Aquifer my well water is supplied by required Tonawanda to remain unchanged. Years ago the Army Corps of Engineers did a study to dam the Creek to prevent flooding in Erie County. Project would have permanently flooded large areas of agricultural lands in Genesee County, adversely affecting the livelihood of the farming and dairy industry here.

Residential (Wyoming County)

ID #	Comment
3153	N. Washington St: problems every year. Man changed flow of creek years ago from end of street. Now old creek bed fills up near house and doesn't drain. In 1998 flood, this was the source of flooding in our basement and 1st floor, doing much damage (electrical, furnace, carpets, and walls). Old creek bed needs to be leveled out so water drains into creek. Also, much debris (i.e. downed trees) blocking flow of water in existing creek bed.
3185	Severe flooding occurs along Washington / N. Washington neighborhoods every spring. Little has been done to protect this area in past 58 yrs.
3513	Oatka and tributary Pearl Creek fears: Work on Pearl Creek bed over summer with DEC & NRCS. When Oatka overflows banks here, flows over 1200' of farmland in some places. Backs up Pearl Creek sending water across Rt. 19, just south of Wyoming Rd. across our fields and towards the farmstead. Many basements flooded in Pearl Creek Hamlet. In major floods (i.e. 1972 & 1989) Oatka and Pearl send water over G&W railroad tracks into gravel pit, which fills then spills across our fields, cutting deep channels and depositing hundreds of tons of sand and sediment. Silt also blocks flow in ditches and tile outlets affecting underground drainage tile that costs thousands of dollars to install. Silt deposits these rates seen will cause loss of many acres of valuable farmland over next decade. Need to clean up logjams, dig out key sandbars between North of Pavilion and South of Wyoming. <i>R.L Jeffres & Sons, Inc. and Jeffres Farms</i> willing to donate time and equipment to facilitate project. Phone (585) 584-3110
3700	Creek Bank erosion major is during flooding. Spring floodwaters in 2001 & 2002 rose 6ft over bank and approaching house. Contacted WCSW, est. cost \$14,000-

	\$16,000, but no funding available. Please contact with any advice: Robert Schmieder 585-535-0259
4089	Severe erosion & loss of property along Oatka Creek just south of village of Warsaw on Rt. 19. Loss hundreds of ft of acreage along Oatka as result of high water and debris in the creek. Daughter's driveway that was 150 ft from creek when install is now less than 20 away. Recently received permission and instructions from DEC for a channel to reroute some of the water.
4124	Main concern is Relyea Creek stream bank erosion. Rt. 19 bridge compromised during flooding.
3629	Village Brook in Wyoming causes severe erosion in back yard along break wall. The creek direction was changed some years back forcing water to make 2 right angles before continuing to bridge. Village brook should be straightened behind my house.
3748	17 years ago, bridge in front of house was replaced with a box culvert, which was about one-third the size of the original bridge. This was the reason for my flooding in 98.
3236	Flooding at 11247 Genesee Street, Attica. Flooding was not a problem prior to county rebuilding bridge those Tonawanda tributary flows under.
3133	Water Street flooding, Attica: flooding where I live could be helped by building dike on landowners back property lines from Water Street to North Street. Part of problem caused by a dam, which carries sewage from west to east side of village. Dam doesn't cross-stream at 90 degrees, causing erosion along banks on Water Street. Wall and trees fallen into creek behind old theater (now a tavern). Flood issues along lower Prospect Street where 2 loves lost.
3852	Oatka Creek, village of Warsaw: creeks narrows, twists and turns as it flows North from Court St bridge, creating bottleneck and causes it to overflow banks < 1/2 mi from bridge. We feel Oatka creek should be widened and straightened from the Court St bridge to "old Buffalo Rd" (village limits), greatly reducing flooding in the populated area of the village.
3876	1955 Flood: Still building house, flooding basement up to 1st floor. Lost furnace and water heater, freezer. Grease on rafters from gas station on Buffalo St.
3753	After 97 flood, path of creek moved couple hundred ft. toward road destroyed a cabin. Erosion is continuing towards my house and neighbor's. All levels of government will not assist in problem, only issue permit to do work ourselves. I have a video of flooding in the area and other flood damage in the town if interested. <i>Frank Piacente. 2168 Route 98 Attica NY</i>
3814	Between 1973-1974 the state came in and altered the natural flow of the Tonawanda in back yard, where it previous flowed straight and caused no problems. They created a berm 12' high along the 500 ft. of creek bank in our yard. Each year high water would flow behind this bank leaving a trail of debris, garbage, dead cow parts, syringes in our yard. In 1996, acquired permit to level the berm and grade the yard back to the streambed, costing \$6000. The 200-year flood in 1998 brought in so much water and sediment from the hills West of here overflowed a pond across the street and eventually meets the creek churning up a storm and ate up our yard foot by foot. DEC permit was still valid after this storm and spent \$12,000 on a bulldozing crew to put yard back in place. Creek eventually going back to state it was in before it was

	messed with in the 70's. Call 585-535-7363 for more info. We have video of the '98 flood.
3291	Tonawanda Creek bed between Varysburg and Attica has an abundance of logs and debris in it. Frequent flooding occurs behind Attica Rodeo Grounds & contributes to damage of personal property on Exchange Street in Village of Attica. Retains walls behind Attica Fire Hall in very bad condition, need immediate attention. Tonawanda Creek under the railroad overpass in downtown Attica collects much debris/logs. Drainage on Exchange St needs serious attention (not enough catch basins). Village Park on Exchange St has no drainage, sees lots of standing water.
3120	Property at 112 Market St is gets flooding when runoff from across street backs up in culvert across Rd. Normally culvert empties into the Tonawanda, but it is already above its banks, it comes across the road (Rt. 98) and towards our house (which sits 8-10 ft below Rd.)
3432	We feel that if the trees that fall across and into the creek (Tonawanda) creek would keep flowing without the damming and overflow during hard rains. This happened in 98. Trees cause creek to re-route through our property until trees gave way, water then gushed into Attica Village.
3402	Approx. 400ft of backyard has been eroded away during Tonawanda Creek flooding events over past 40 years and is getting way too close to house.
3477	Was willing to accept yearly spring and fall flooding when purchased property. All appliances in basement are on concrete blocks; take down pasture fence yearly, put back up after flood season, plant flood resistant varieties of plants.
3366	Last year Attica town crew came out and removed a large curve in the Creek (Tonawanda), seems to have helped move water more rapidly without backing up and going over the bank.
3366	Flood Insurance does not cover anything below grade except a furnace, appliances and unfinished drywall. We are required to carry flood insurance because of SBA disaster loan, but unless house is carried away in a flood I never see more than a few dollars after paying \$700/year premium.