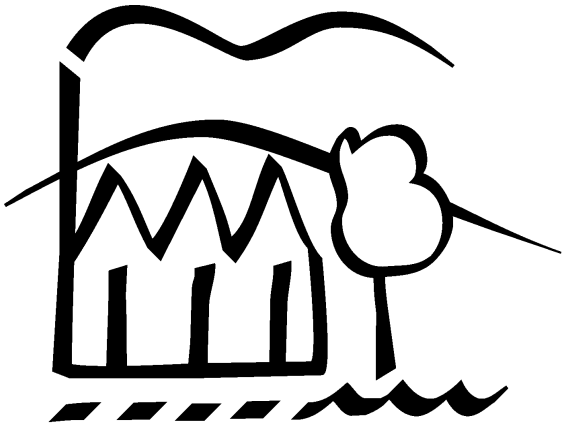
Village and Town
Of Arcade
Flood Mitigation Action Plan



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Flood Mitigation Action Plan

1. - Introduction

The Village and Town of Arcade 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 October 1997, meetings to discuss flooding problems and streambank erosion issues in the Village and Town of Arcade have been held and attended by a number of local, regional, state and national agencies.

From these discussions the Arcade Flood Mitigation Planning Committee was formed (hereafter referred to as the Committee). The village, as lead agency on behalf of the town and village, applied for and was awarded a Federal Emergency Management Agency Flood Mitigation Assistance - Planning Grant from the New York State Emergency Management Office.

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 Village and Town of Arcade. This plan describes and summarizes the Committee's process, findings, and recommendations.

2. - Background

The Village and Town of Arcade are located in the southwest corner of Wyoming County in western New York with Erie County to the west and Cattaraugus County to the south. The Holland Land Company purchased the land on which the Village and Town of Arcade now rest in 1792.

Originally part of the Town of Batavia in Genesee County, the area underwent three separate name changes until it was renamed Arcade in 1866. In 1871 the Village was incorporated. Presently, the Town covers an area of approximately 47.1 square miles of which the Village occupies 2.5 square miles.

This section is meant to provide an overview of the characteristics of Arcade's residents, housing, and businesses, the sources of the flooding problems, and a brief history of past floods in the village and town.

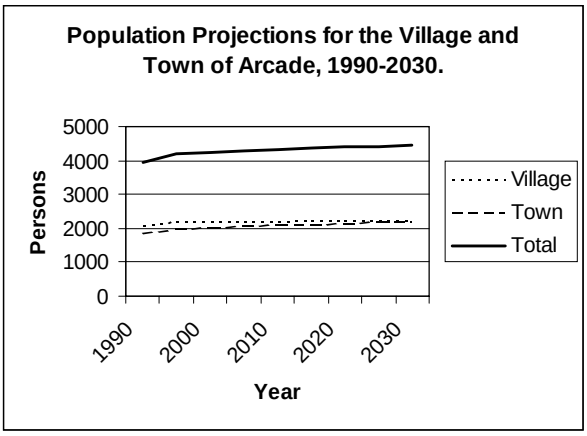
2.1 - Population, Housing, and Socioeconomic Characteristics

The 1990 census showed that 2,082 people lived within the village limits with an additional 1,857 people living in the Town of Arcade. Therefore, the total population for the study area was 3,938 in 1990.

As a community, the Village and Town of Arcade are experiencing steady growth making them one of the faster growing communities in Wyoming County. According to population projections done by the Genesee/Finger Lakes Regional Planning Council, the estimated population of the village and town in 1995 was 4,195. The population of the town and village is expected to increase to 4,449 by the year 2030.

According to these projections, both the village and town are expected to experience a steady, albeit slight, increase in population over the next 30 years. Graph 1 shows the population projections for the village and town from 1990 to 2030.

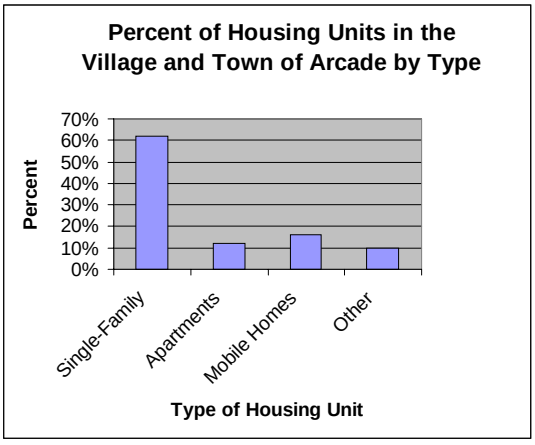
Graph 1



Source: New York State Association of Regional Councils, 1997.

In 1990, there were 817 housing units in the village and 780 housing units in the town. Of the 1597 total housing units, the majority (62%) are single-family homes. Mobile homes and apartments made up an additional 28% of the housing stock. The distribution of housing units by type is displayed in Graph 2.

Graph 2



Source: U.S. Census Bureau, 1990.

In 1990, 62% of all occupied units were owner-occupied. The median value of owner-occupied units was $55,400 in 1990. During the 1990's the Town of Arcade was one of the two communities with the highest number of permits issued for new homes in Wyoming County.

The manufacturing/industrial base in Arcade is the strongest in Wyoming County. Arcade's major employers include Prestolite Electric, American Precision, and Koike Aronson, which combined employ over 850 people.

Agriculture is also a significant industry in the town and the village has a number of agribusinesses. The locally operated Arcade & Attica Railroad is the second largest tourist attraction in Wyoming County (after Letchworth State Park) with an estimated 27,000 riders per year.

Median household income in 1989 for the village was $25,784 and slightly less for the town at $25,108. The same held true for per capita income in 1989 with the village at $11,148 and the town at $10,848. The percent of persons for whom poverty status was determined by the Census Bureau was 10.4% in the village and 7.3% in the town.

2.2 – Sources of the Flooding Problems

The primary sources of flooding in the Village and Town of Arcade are Cattaraugus Creek and Clear Creek. Cattaraugus Creek enters the town from its northern border between East Arcade Road and Java Lake Road. Cattaraugus Creek flows southwesterly until reaching the village, where it continues westerly, running parallel with Main Street and North Street until exiting the village.

Tributaries of Cattaraugus Creek also pose flood risks to the town. Tyler Brook flows southwesterly and enters Cattaraugus Creek approximately four-tenths of a mile north of Clark Road. Spring Brook crosses Allen Road and enters Cattaraugus Creek running parallel with East Arcade Road.

The other significant tributary that enters Cattaraugus Creek is Monkey Run which flows south along the Arcade & Attica Railroad tracks from the town's northern boundary until joining Cattaraugus Creek at East Arcade Road to the west of Cattaraugus Road.

Clear Creek enters the town from the south approximately eight-tenths of a mile east of the village boundary. It flows northwesterly until its convergence with Cattaraugus Creek under the bridge on East Main Street.

A stream referred to as Haskell Creek enters the village from the south approximately 1000 feet east of Park Street running parallel with NYS Route 98. Before it enters Haskell Avenue, an 18-foot high abandoned railroad bed obstructs water from the creek.

There is a 36-inch pipe under the railroad bed that constricts the flow of water as Haskell Creek flows northeast along Haskell Avenue until it converges with Clear Creek near the intersection of Haskell Avenue and Liberty Street.

In the village and the town, the areas most susceptible to flood damage can be found along these creeks and their tributaries. Revised Flood Insurance Studies (FIS) were done by the Army Corps of Engineers (ACE) for the Federal Emergency Management Agency (FEMA) in 1992.

These studies indicate that the principal flooding problems are located along Cattaraugus and Clear Creek and the floodplain within the village. Cattaraugus and Clear Creeks converge in the eastern end of the village, and it is at this confluence that the greatest amount of flooding occurs. This is of special concern because there is a large amount of residential and commercial development in this area.

Maps of the village and town included in this report display the 100-year floodplain and floodway area for the Village and Town of Arcade. 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.

According to FEMA, "[t]he 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 (*Village of Arcade Flood Insurance Study*, FEMA, March 3, 1992: 2).

2.3 - A Brief History of Flooding Problems

Low-lying areas in the Village of Arcade are subject to periodic flooding caused by the overflow of Cattaraugus Creek and Clear Creek at their confluence. In addition, flooding at the Water Street and Main Street bridges occurs as a result of clogging by trees and debris. The floodwaters from both areas back up and flow down Pearl Street and along the south side of Main Street.

Other frequent flooding areas in the Village are Church, Park and Water Streets. The runoff coming down the hill at the end of Park and Water Streets, and the overflow diversion area from Haskell Creek, are the main sources of flooding in this area of the Village (*Village of Arcade Flood Insurance Study*, FEMA, March 3, 1992: 2).

In the Town of Arcade, the principal flooding problems are located along Cattaraugus Creek and its tributaries as well as Clear Creek near the southern border of the town. The Flood Insurance Study states that most major floods in recent years have occurred in the late spring or early summer and were caused by excessive rainfall. However, flooding has also occurred during the winter as a result of snowmelt combined with rainfall.

The greatest recorded flood occurred in the Village and Town of Arcade on July 6, 1902; it was estimated to have had a recurrence interval of greater than 200 years. Other significant floods occurred in the Village and Town of Arcade in 1908, March 1942, March 1956, September 28, 1967, March 1971, June 1972 (Hurricane Agnes), June 18, 1984, June 11, 1986, June 21, 1989, January 19, 1996, June 1996, and June 26, 1998.

Newspaper articles describing the 1902 flood reported "a torrent of water, six feet deep, pouring down from Clear Creek along Main Street and Pearl Street." (*ACE Memorandum*, December 12, 1990: citing newspaper articles printed by the *Wyoming County Herald*, July 11 & 12, 1902).

The flood of September 28, 1967 "produced substantial damage" (*ACOE Memorandum*: 3). Although this flood had an estimated recurrence interval of 40 years *(Village of Arcade Flood Insurance Study*: 3-4), the total precipitation was 4.0 inches on September 28 and 0.92 inches the next day. This heavy rainfall resulted in over $27,000 in damage to approximately 40 residences and commercial establishments as well as public property.

After the flood of June 1984, "many people recalled it was the highest water in town since the aftermath of Hurricane Agnes in 1972, when the creek rose above the street level." Areas affected included the elementary school, village offices and the backup well on Church Street as well as portions of Park Street, Mill Street, and Haskell Avenue. (*Wyoming County Herald*, *June 21, 1984*.)

In 1989, on June 21 and 23, 4.6 inches of rain fell in the basin. "The flood resulted in many residences, buildings, and basements being flooded, people being evacuated on Main and Water Streets, major damage to public roads, farm erosion and crop damage, and a declaration of a State of Emergency.

Based on backwater computations, it is estimated that the June 1989 flood had a discharge of 9,700 cubic feet per second and a 100-year frequency of occurrence." *(ACOE Memorandum:* 3) After this flood local officials sent out damage questionnaires to the residents affected by the flood and the Corps of Engineers established high water marks and conducted damage surveys. The Corps determined that most of the structures in the flood area were residential and commercial and that the flood had resulted in approximately $645,000 in flood damage *(ACOE Memorandum:* 5).

The more recent floods in the Village and Town of Arcade have also been severe. On January 19, 1996 the area experienced flooding at American Precision Industries on Route 98 (as a result machine oil was washed into Cattaraugus Creek); on Genesee Road at Route 98; at the Town Highway parking lot; in the Open Gate Trailer Court (about 20 units were affected) where flooding from Cattaraugus Creek came over the road and over the railroad tracks (at Genesee Road and behind the Open Gate Trailer Court); in the Mockingbird Campground; at a residence on Route 98 south of Genesee; and at Ray Milks' Farm Market. There was substantial flooding the following spring as well.

The June 26, 1998 flood served as the impetus for the creation of this plan and has been well documented. A video of the flooding was produced and shows the floodwaters as they inundated Main Street, Route 98, Water Street, and other areas as described later in this report. Information from residents, officials, and business owners regarding the June 26, 1998 flood is referenced frequently and serves as the basis for the delineation of areas that can expect to be flooded again during heavy rainfall.

2.4 - National Flood Insurance Program (NFIP) Participation

As of December 12, 1998 there were three NFIP policies in place in the Town of Arcade and 27 in the village. All three of the policies held in the town are in the FIRM's A-Zone. Over half of the policies (15 of 27) in the village fall within the A-Zone. Table 1 provides a summary of NFIP policy and claim information for the village and town.

Table 1

NFIP Policy and Claims for Arcade, New York as of Dec. 12, 1998					
	Total Policies	Total Premium	Coverage Total	Claims Since 1978	Total $ Issued Since 1978
Village	27	$ 11,304.00	$ 1,865,200.00	25	$ 228,218.00
Town	3	$ 1,324.00	$ 132,500.00	3	$ 767.00

Source: Insurance Services Office, Inc., 1999

Since 1978, there have been three claims for damages in the town for $767 and 25 in the village for $228,218. Thirteen of the claims in the village were made between November 4, 1998 and December 2, 1998. It is likely that the majority (if not all) of the claims were a result of the June 26, 1998 flood. The total premium paid for the three policies in the town in 1998 was $1,324, providing $132,500 in coverage.

As of June 1999, there are five structures in the village that have experienced repetitive losses as a result of flooding. There are no repetitive loss structures in the town at this time. Of the five repetitive loss structures in the village, four filed claims after the June 22, 1989 and June 26, 1998 floods. The remaining repetitive loss structure also filed a claim after the June 26, 1998 flood; however, the previous claim was filed following the January 19, 1996 flood which was due to excessive snowmelt.

3. - Planning Process

This plan is a result of the work done by the Arcade Flood Mitigation Planning Committee and its subcommittees. The Committee was comprised of representatives from public agencies, businesses, and private citizens.

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 Arcade would be included in the development of the flood mitigation action plan.

Three subcommittees were also formed to address critical aspects of the flood mitigation action plan: Public Outreach/Participation Subcommittee (POPS), Flood Hazard Assessment Subcommittee (FHAS), and the Flood Solutions Development Subcommittee (FSDS).

The Committee and sub-committees met monthly beginning in December 1998. This section 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 – Arcade Flood Mitigation Planning Committee and Sub-Committee Meetings

The documentation provided below offers a brief synopsis of each meeting held by the Committee and the POPS, FHAS, and FSDS. The Village of Arcade's Superintendent of Public Works took attendance and notes for each meeting.

Full Committee

December 18, 1998 – 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 and identify flood hazard areas.

It was decided that a Public Outreach and Participation Subcommittee (the POPS) and a Flood Hazard Assessment Subcommittee (the FHAS) would be formed and each member of the Committee present chose to work on one of the two subcommittees.

January 15, 1999 – A review of actions by the POPS at their initial meeting was presented to the Committee. The goals and objectives of the flood mitigation action plan were discussed along with possible action steps and the progress of the planning process.

February 19, 1999 – The Committee reviewed the progress of the POPS and FHAS and a check on the planning process, and further discussion of the goals and objectives of the plan took place. An identification of critical facilities followed along with possible action steps for making flood information readily accessible to residents, businesses, and others.

March 19, 1999 – The responses from the residential/agricultural survey developed by the POPS were given to the G/FLRPC for tabulation and analysis. A copy of the POPS's commercial/industrial survey was shown to the Committee for review and comments. Public information meetings, as suggested by the POPS, were also discussed. The data collected by the FHAS were reviewed and the Committee explored other possible sources of data collection.

April 16, 1999 – A discussion of several warning systems to be used in the event of a flood was given and the relevance of each one to Arcade followed. An initial draft of the basemap showing the floodway, floodplain, municipal boundaries, roads, and hydrography was reviewed. The Committee also reviewed the work done by the subcommittees.

May 21, 1999 – The Committee decided that the work of the POPS was complete and that the Committee at its monthly meetings would handle any additional public outreach and participation activities. The activities of the FHAS were discussed and that the work of that subcommittee would be completed following its next meeting.

June 18, 1999 – The Committee decided that for the month of July, it, the FHAS, and the POPS would be combined to form the Flood Solutions Development Subcommittee (FSDS). A draft of the flood mitigation action plan was distributed for comments and review to the Committee members present with additional copies to be sent to members not able to attend.

A copy of the *Flood Solutions Worksheet* developed by the Southern Tier Central Regional Planning and Development Board was distributed for the upcoming FSDS meeting.

Flood Hazard Assessment Subcommittee

January 7, 1999 – The FHAS inventoried existing reports, studies, and data that was available from federal, state, county, and local agencies and departments. Also reviewed was existing work underway by the Wyoming County SWCD and the NRCS. A survey of structural elevations in the village and town was considered and deemed a worthwhile task provided that funding was available.

February 25, 1999 – The topics addressed included the surveying of structures at various locations throughout Arcade and damage to the Arcade & Attica Railroad as a result of the past summer's flooding and other floods.

The number and location of structures to be surveyed for ground elevation and first floor elevation was clarified and damage to tracks owned by the Arcade & Attica Railroad was discussed along with action steps for alleviating similar damage in the future.

March 25, 1999 – The primary focus of the meeting was the identification and surveying of structures that have been repeatedly damaged by flooding (according to the surveys) and the use of this data to the Committee in determining appropriate action steps to mitigate damages due to flooding.

Aerial photos of the village and town from 1963, 1974, 1985, and 1990 were provided by the Wyoming County SWCD and the members present identified areas where Cattaraugus and Clear Creeks and their tributaries had diverged from their previous course, new development had occurred, and flooding problems were persistent.

April 23, 1999 – The FHAS reviewed proposed structures to be surveyed in the village and town. Revisions to the list were made and were approved for submission to Douglas C. Myers Professional Land Surveyor, P.C.

May 28, 1999 – The critical facilities in the village and town were finalized and placed on a draft map for digitization in the GIS. Areas flooded during the June 26, 1998 flood, but not shown on the FIRM, were delineated and placed on the draft map for approval at the June 18 meeting of the Committee.

Public Outreach/ Participation Subcommittee (POPS)

January 14, 1999 – The POPS addressed the issues of educating property owners on the NFIP, developing surveys to address flood damage form the previous summer, and providing the *Arcade Herald* with information on the flood mitigation action plan and planning process.

January 22, 1999 – The meeting focused on the NFIP and raising awareness of its benefits to homeowners. The meeting served as an informational session on the NFIP and the pros and cons of the program were discussed. The residential/agricultural and commercial/industrial surveys were developed.

February 11, 1999 – It was announced that the residential/agricultural surveys had been sent and that the commercial/industrial survey would also be mailed shortly. The POPS carried on the planning of informational meetings regarding flood insurance, contacting local newspapers concerning the plan, and other possible meetings and topics for the future.

March 11, 1999 – There was a review of the commercial/industrial survey and the survey was sent to local businesses. Further preparation for the public information meetings was carried out as was continuing communication with local newspapers.

April 8, 1999 – Dates and venues for three public participation meetings in May was finalized and announced to the local press. A flier for the meetings was produced, comments were made, and the flier was to be distributed after a review by the Committee. Presentations for the meetings were developed and passed on for review by the Committee.

Flood Solutions Development Subcommittee (FSDS)

July 16, 1999 – The comments and revisions of the draft report were submitted and the additional flooded areas of the June 26, 1998 flood were finalized. Proposed streambank erosion remediation projects in the village and town were presented by the Wyoming County SWCD. Many of the proposed projects were determined to have a positive impact on flooding in Arcade.

July 23, 1999 – The FSDS worked through the *Flood Solutions Worksheet* and discussed the full range of possible action steps and solutions to the flooding problems in Arcade. The flood solution recommendations provided in this plan are the outcome of not only this meeting and the previous FSDS meeting, but the diligent efforts of the Committee and the other two subcommittees.

3.2 – Coordination among Relevant Agencies

The Arcade Flood Mitigation Planning Committee included members from various municipal departments and local businesses. Present on the Committee from the Village of Arcade were the Superintendent of Public Works, Clerk, and board members.

Town of Arcade employees and officials on the Committee included the Highway Superintendent, Zoning Enforcement Officer, and town council members. Others from the

village and town who regularly attended meetings included a representative of local merchants, an insurance agent, realtor, surveyor, and the general manager of the Arcade & Attica Railroad.

Representing relevant agencies from Wyoming County were the County Planner, Director of the Soil and Water Conservation District, and Emergency Services Coordinator. Also present were planners from the Genesee/Finger Lakes Regional Planning Council.

The regional Water Program Specialist represented the NYS Department of Environmental Conservation (DEC) and the Regional Director attended Committee meetings for the NYS Emergency Management Office (SEMO).

Participants from the various agencies participated in the planning process by providing assistance in their area of expertise, collecting and disseminating data and information to the Committee and sub-committees, reviewing draft versions of the plan, and investigating solutions to the flooding problems in Arcade.

Other individuals from municipal and county agencies were also invited to serve on the Committee but were unable to attend meetings. In addition, staff from the Army Corps of Engineers' Buffalo Office was also contacted for assistance. Table 2 below lists the various agencies, departments, and interests represented on the Committee.

Table 2

Agencies Represented in the Arcade Flood Mitigation Planning Process
Village of Arcade
Town of Arcade
Arcade Merchants
Wyoming County Department of Economic Development and Planning
Wyoming County Soil & Water Conservation District
Wyoming County Emergency Management Office
Genesee/Finger Lakes Regional Planning Council
NYS Department of Environmental Conservation - Region 9
NYS Emergency Management Office
US Department of Agriculture - Natural Resources Conservation Service
US Army Corps of Engineers

3.3 – Public Involvement and Outreach

The Committee and, in particular, the Public Outreach/Participation Subcommittee focused on increasing residents' awareness of the flood mitigation action plan and planning process and solicited input from residents regarding the extent of previous flooding and possible solutions.

In early March 1999, a survey was sent to residents and businesses requesting information regarding past flooding. The survey included questions pertaining to past flooding, source of floodwater and proximity to creeks, depth of water on property, and damage to property among others. Copies of the residential/agricultural and commercial/industrial surveys are included in Appendix A.

Of the nearly 1200 residential/agricultural surveys sent, over one-third were returned. Due to such a high response rate, the survey served as an invaluable resource in identifying areas susceptible to flooding not shown on the Flood Insurance Rate Map (FIRM). A large percentage of the commercial/industrial surveys were also returned.

In May 99, the Village and Town of Arcade sent a flier to residents publicizing three events regarding the flood mitigation action plan, planning process, and National Flood Insurance Program. Two of the events were informational meetings. A copy of the flier is provided in Appendix B.

The first informational meeting was held on May 5 and utilized displays and a short presentation by the Genesee/Finger Lakes Regional Planning Council to introduce the planning process to residents. A question and answer session followed in which residents voiced their opinions and concerns regarding the flood mitigation action plan and received feedback from Committee members.

The local school district (Pioneer Central School District) held its annual fair on May 8 and the Village of Arcade's booth included a video of the previous summer's severe flooding (June 26, 1998) and several informational displays on the flood mitigation action plan for the village and town. Representatives from the Committee were available to answer questions and provide insight into the planning process.

At both the May 5 public information meeting and the Pioneer Community School Fair there were copies of the survey available for residents and businesses to complete if they had not done so already. In addition, blank notecards were available for persons wanting to leave comments or suggestions for the Committee to review at future meetings.

The third event was a flood insurance informational meeting organized by the Arcade-Knight Agency and the Independent Insurance Agency of New York. A representative from the NFIP gave a presentation and answered questions regarding the program.

As stated earlier, very few homeowners in Arcade are enrolled in the NFIP. It was hoped that this presentation would increase residents' awareness of the benefits available through the NFIP and induce more property owners into purchasing coverage through the NFIP.

Local newspapers in Wyoming and Genesee counties also served as a medium for informing citizens of the flood mitigation action plan and opportunities for participation in the planning process. Appendix C provides articles detailing the flooding problems, associated hazards, and measures taken and planned to alleviate these hazards.

3.4 - Review, Revision, and Adoption of the Plan

Draft versions of the Village and Town of Arcade Flood Mitigation Action Plan were distributed to Committee members and interested citizens. A draft version of the plan was reviewed by the Committee, revised based on comments and suggestions, and sent to the Village of Arcade Board

of Trustees and Town of Arcade Common Council for further comment and review. Additional changes to the plan were based on comments from the municipal legislative bodies and the plan was finalized for submission to SEMO and FEMA.

The Arcade Flood Mitigation Planning Committee will meet quarterly to monitor progress on completing the action items and assist the Town and Village Boards in implementing the plan. The revision and update of the plan is necessary to evaluate changes in flood hazards and risks as a result of implemented actions from this plan and natural processes that alter the paths of Cattaraugus Creek and Clear Creek as well as their tributaries resulting in changes in flooding patterns.

4. - Flood Hazards

Areas prone to frequent flooding exist throughout the village and town. 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 Village and Town of Arcade. Initially, the Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) provided by the Army Corps of Engineers 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:

- the survey developed by the Public Participation/Outreach Subcommittee,
- information from local, county and state agencies gathered at Committee and Flood Hazard Assessment Subcommittee meetings,
- residents' input at the public information forum on May 5, 1999,
- FEMA listings of properties applying for assistance after the June 26, 1998 flood,
- aerial photographs of Cattaraugus and Clear Creeks provided by the Wyoming County SWCD
- municipal fire department records of flood related calls (including pumping water from residences),
- and previous studies and reports.

The intensity and breadth of flooding in the Village and Town of Arcade are caused primarily by riverine flooding from Cattaraugus and Clear creeks. Hazards due to riverine flooding occur when Cattaraugus and Clear creeks overflow their banks due to excessive rainfall, snowmelt, or a combination of both. The excess water flows onto adjacent land causing damage to property and risks to personal safety.

The increased amount and velocity of water moving through the creeks' channels results in increased streambank erosion and ponding in areas where drainage measures aren't sufficient to diffuse the increased runoff. This section presents a description of the flood hazards in the Village and Town of Arcade by street that result from riverine flooding, streambank erosion, and ponding. A review of development in the floodplain with special attention to critical facilities and discussion of the current county emergency plan is also provided.

4.1 Description of Flood Hazards

Three types of flood hazards are discussed: riverine flooding, ponding, and streambank erosion. In addition to the FIRM, the other sources listed above were also used to delineate additional areas that are likely to be affected during periods of heavy rainfall.

Regardless of the effect on improvements, the presence of floodwaters on a parcel increases the likelihood of streambank and sediment erosion as well as ponding that compromises the ability of roads to be used for the delivery of emergency services and as evacuation routes.

4.11 – FIRM Determined Base Flood Hazard Areas

The following description of flood hazard areas provides an identification of areas in Arcade that will be affected by a 100-year flood (according to the FIRM). A summary of flood hazards based on the FIRM and FIS is provided in Appendix D as a matrix.

The number of parcels affected by property type is provided for each street. The number of parcels listed represents those parcels that will have some area inundated with water whether or not buildings or other improvements on the parcels are affected during an intermediate regional flood.

North Woods Road/Hurdville Road: Few parcels fall within the 100-year floodplain in this area on the western border of the village and town. Half of the six parcels are vacant. Only two residential parcels are found here: one is a single-family residence and the other is a large rural residence of over fifteen acres. Three businesses operate along North Woods/Hurdville Road inside the 100-year floodplain. The Arcade sewage treatment plant is located on Hurdville Road in the village.

Main Street: The largest number of parcels within the floodplain are along Main Street within the village. A large number of the parcels and structures within the 100-year floodplain are located near the confluence of Cattaraugus and Clear Creeks. Of the parcels at risk, there are a nearly equal number of residences and businesses. Much of the village's downtown area of storefronts and shops are at risk to flooding.

As could be expected, many of these structures located in the downtown business district are quite old having been built in the late nineteenth or early twentieth century. Also located along Main Street are two churches. During flooding, water from Cattaraugus Creek over flows its banks on the north side of the street and water from the confluence of the two creeks also inundates the street.

Additional flooding of the street results from water carried down from streets connecting to Main Street. Park Street, and Bixby Hill Road all have higher elevations south of Main Street. As rainfall accumulates on properties along these roads, ponding occurs and the stormwater flows to the paved roads and downhill towards Main Street. During flooding this poses problems for emergency service personnel attempting to reach residences and businesses on Main Street.

North Street: The majority of parcels (53%) located along North Street (including the portion in the eastern end of the village that constitutes NYS Route 98) are single-family residences. Two businesses are located on the NYS Route 98 portion of North Street. The remaining seven parcels are vacant with one zoned for commercial use.

During the June 26, 1998 flood stormwater runoff from the apartment complex for seniors on Douglass Drive flowed onto North Street. The flooding was not severe enough to make the street unreachable by emergency vehicles.

West Street: Of the nine parcels on West Street within the floodplain, all but one is residential. Half of these residences are two-family homes and there is also a farm present. During heavy rainfall, flooding from Cattaraugus Creek inundates portions of West Street and joins with runoff from Main Street from overland flooding from the adjacent Bixby Hill Road making travel for emergency vehicles difficult.

Church Street: There are no residences located on Church Street that sustain damage due to flooding. In addition to flooding from Cattaraugus Creek, stormwater from Main Street flows down Church Street resulting in a hazard to Pioneer Elementary School, the village offices including the police station, and a backup public well that supplies water to the village.

Park Street: There are five residential parcels and one vacant parcel within the 100-year floodplain on Park Street. Of major concern is the slope of Park Street from the Arcade & Attica rail line north towards Main Street. This section of Park Street experiences ponding and large amounts of stormwater drain onto Main Street causing additional hazards on Church Street.

Sullivan Avenue: Flooding from Haskell Creek affects five residences and one vacant lot and causes runoff onto the street and ponding on properties located on Sullivan Avenue. The village's electric and water departments' garage is located here as well as the second backup well. Stormwater runoff from the Village Park erodes residential landscaping and carries debris that collects downstream causing further encroachment in the floodway.

Mount View Drive: According to the FIRM, only one single-family residence is affected by riverine flooding from Haskell Creek during a 100-year flood.

Jackson Avenue: A subdivision of fourteen lots, only one of the lots currently contains a residence. All of the lots fall within the 100-year floodplain based on the FIRM. A man-made pond is also present within the subdivision. The presence of this pond coupled with extensive rainfall may intensify flood hazards in the subdivision if new structures further impede the flow of water.

Glenwood Drive: Based on the FIRM, five residences are within the 100-year floodplain. While the FIRM assumes that this riverine flooding from Haskell Creek, the hazards to these residences is a result of overland flooding due to stormwater runoff.

Because of the limitations of the 36-inch pipe under the abandoned railroad right-of-way and another pipe under Haskell Avenue, these residences receive runoff from the south as excess water flows northwesterly running parallel with between Liberty Street and Glenwood Drive.

Liberty Street: The street begins at the convergence of Cattaraugus and Clear Creeks on Main Street and heads southeast running parallel with Clear Creek. Riverine flooding at the convergence of the two creeks is increased as additional riverine flooding from Clear Creek flows downstream across the back half of properties on the east side of the street.

There are 23 residences, 8 businesses, and 3 vacant parcels within the 100-year floodplain on Liberty Street. These parcels do not include those parcels outside of the village limits which are discussed later.

Haskell Avenue: There are eleven single-family residences and a parcel occupied by the Arcade & Attica Railroad on Haskell Avenue within the 100-year floodplain of Haskell Creek. As with Glenwood Drive, stormwater runoff as a result of the limitations of the pipe under the abandoned railroad bed to the west of the eleven residences in combination with overland flooding from the diversion ditch at the south end of the street is responsible for the flood hazards.

Deacon Drive: Overland flooding is the main hazard to the ten single-family residences within the 100-year floodplain. But only the eastern portion of the lots and not the structures themselves are affected by the flood hazards.

Pearl Street: The main flood hazard on Pearl Street is the confluence of Cattaraugus and Clear Creeks. There are twelve residences that fall within the 100-year floodplain, with all but one being single-family homes.

Sanford Avenue: According to the FIRM, riverine flooding from Cattaraugus Creek would affect only one commercial property at the intersection of Main Street and Sanford Avenue during a base flood. While the property has a Main Street address, the FIRM delineated floodzone shows encroachment on the Sanford Avenue side of the parcel.

Water Street: A base flood would affect seven residences and one vacant parcel on Water Street. The bridge over Cattaraugus Creek is the only critical facility on the street and is discussed in the next section.

Maple Street: Riverine flooding from the convergence of Cattaraugus and Clear creeks would affect one single-family home during a 100-year flood. There does not appear to be any additional hazards due to stormwater runoff.

Grove Street: Given the proximity to Clear Creek, this area is not affected as heavily as streets to the west and south of it. According to the FIRM, only two parcels are at risk during a base flood: one is a residence and the other is vacant.

Curriers Road: As determined by the FIRM, there are three farms and a three-family residence within the 100-year floodplain. Monkey Run, a tributary of Cattaraugus Creek is the source of the riverine flooding on Curriers Road.

Clough Avenue: Of the parcels on Clough Avenue within the floodplain, one is a single-family residence and the other is vacant farmland. Flooding from Clear Creek and stormwater runoff from the village park during heavy rain falls account for the hazards to these two parcels.

Clearview Drive: There are two single-family residences within the 100-year floodplain of Clear Creek. There does not appear to be any hazards caused by stormwater runoff.

Stuart Avenue: There are three single-family homes and a church in the 100-year floodplain of Clear Creek. Like Clough Avenue, stormwater runoff and ponding result from the overflow from the village park.

Sherman Drive: There are seven single-family residences and a vacant residential parcel that are at risk of damage from riverine flooding from Cattaraugus Creek during a base flood. No ponding or unavailability of roads due to runoff has been reported during previous floods.

NYS Route 98 South: There is a mix of different uses of parcels within the 100-year floodplain of Clear Creek. This area of the floodplain includes residential, commercial, agricultural, and community service uses and two vacant lots. Stormwater runoff from an old railroad bed flows across the rear of a medical center located on the west side of Liberty Street which produces additional hazards to properties on Haskell Avenue.

NYS Route 39: The only parcels on NYS Route 39 in the town that lie within the 100-year floodplain are two vacant parcels of productive farmland. Riverine flooding from Cattaraugus Creek combined with ponding across the road produces a risk to residences and businesses to the east of the ponding when emergency service vehicles cannot reach them.

Bray Road: A single-family residence and one lot of abandoned agricultural land are the only parcels within the 100-year floodplain along the southern boundary of the town. In addition to hazards created by riverine flooding from Clear Creek, there is overland flooding due to runoff from a farm just outside the southeast boundary of Arcade in the Town of Freedom.

NYS Route 98 North: The portion of NYS Route 98 that is part of Cattaraugus Road has ten agricultural parcels within the 100-year floodplain of Monkey Run Creek. All of the farms are used for the production of field crops. Seven of the eighteen residences present in the floodplain are rural residences with ten or more acres. There are 11 single-family residences. The remaining parcels are vacant.

There has been no record of additional hazards resulting from stormwater runoff or riverine flooding. However, farming practices play a large part in determining the extent of stormwater runoff. The Wyoming County SWCD currently works with farmers to aid in planning the most efficient use of land and minimize risks to public safety. There are also two businesses that operate in the floodplain along with the town's Department of Highways garage.

Phair Road: There is one farm that falls within the 100-year floodplain of Monkey Run Creek. No stormwater runoff from NYS Route 98 has been reported during or after past floods.

Reed Road: The Monkey Run Creek 100-year floodplain involves only three parcels and has experienced no additional hazards as a result of stormwater runoff. Of the three parcels there is a livestock farm, a rural residence with over 10 acres, and a vacant residential parcel.

East Arcade Road: Only one single-family residence lies within the 100-year floodplain of Cattaraugus Creek. The other two residences are seasonal and there are five farms that would be affected by a base flood. To date, there have been no reports of drainage problems resulting in ponding on the road itself.

Genesee Road: A small number of residences (2) are located within the 100-year floodplain. However, during the June 26, 1998 flood stormwater runoff inundated Genesee Road at numerous locations. A large amount of sediment was washed across the road by the floodwaters. At one location, the water was five feet over the road.

Stinson Road: There is a single mobile home that lies within the 100-year floodplain of Stinson Road. No additional hazards as a result of ponding or stormwater runoff have been reported.

Allen Road: There is a rural residence of over ten acres and a seasonal dwelling that lie within the floodplain. During the June 26, 1998 flood, a 143-foot stretch of Allen Road near Sullivan Road was one foot under water as a result of ponding and insufficient drainage.

4.12 – Additional Flooded Areas of June 26, 1998

The flood hazard areas described below were determined based on the residential/agricultural and commercial/industrial survey and discussions of the Committee and the subcommittees, primarily the FSDS.

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 during periods of heavy rainfall based on the June 26, 1998 flood.

The western side of Park Street is not included in the 100-year floodplain on the FIRM. However, conversations between the public and the NYSDEC and the Committee have shown that floodwater from Haskell Creek does not flow around the railroad tracks to the east but instead goes over the tracks and continues north.

Residences on Mill Street sustained damage to structures and landscaping due to riverine flooding. Floodwaters also reached the backyards of residences on the east side of Prospect Street but did not extend to the structures.

Residences on Deacon Drive not within the FIRM's 100-year floodplain were also affected as stormwater runoff from the overflowing diversion ditch on Haskell Avenue damaged landscaping and lawns.

In the eastern end of the village, there was flooding on Main Street that reached the Tops Supermarket loading docks and affected properties on William Street, Edward Street, Steele Avenue, and Rule Drive.

In the town, flooding from Monkey Run Creek damaged one farm on Dunn Road in the town and overland flooding damaged farms on Genesee Road.

4.2 - Streambank Erosion

Streambank erosion along Cattaraugus and Clear Creeks and their tributaries is accelerated during flooding due to higher than normal water velocities within the streams. The increased erosion is not limited to streambanks.

As floodwaters overflow their banks, they carry sediment and debris from residential lawns, agricultural land, and other sources further downstream and eventually into the channels of the creeks and their tributaries. This has an adverse effect on aquatic and riparian habitats in not just Arcade but the entire Cattaraugus Creek Watershed.

Both streambank and property erosion results in accumulation of sediment and debris within and along the channel of streams. This accumulation occurs as sediment and debris settles in the channel simultaneously lowering the elevation of the stream banks and raising the elevation of the streambed. The subsequent result is a reduction in the carrying capacity of the streams which causes higher water elevations during future floods.

The bridges in Arcade act as collection sites for this debris causing blockages of the floodway that raise flood elevations further downstream and also threaten evacuation routes during extreme flood emergencies.

The Wyoming County Soil Survey was used to determine what areas along Cattaraugus and Clear Creeks are likely to be susceptible to streambank erosion. Erodibility is based on the "k-factor" for the various soil types present along the banks Cattaraugus and Clear Creeks and their tributaries. Erodibility based on the "k-factor" is split into three categories:

- Low - k = 0.17 to 0.2
- Medium - k = 0.24 to 0.28
- High - k = 0.32 to 0.49

For the most part, highly erodible soils are found along the entire of the streambanks of both Cattaraugus and Clear Creeks, as well as their tributaries. In certain areas, high erodibility soils are present further inland from the streambanks than in other areas.

The soils along Monkey Run Creek near the northern town boundary are mostly medium erodibility soils with lower erodibility soils present behind those. Further south near the point where Monkey Run breaks off from Cattaraugus Creek there is a high proportion of high erodibility soils.

The soils located east of Cattaraugus Road between East Arcade and Genesee Roads along Cattaraugus Creek are highly erodible. Heading further south near the eastern village boundary the soils are mainly of high erodibility along the streambanks, but have with medium erodible soils just off the banks of the creek.

From eastern border to the western border of the village, there is a mix of moderately and highly erodible soils along Cattaraugus Creek. The proportion of medium erodible soils increases along Cattaraugus Creek from the eastern to the western border of the village. Along Clear Creek within the village limits, the soils are mainly of moderate erodibility with lower erodibility soils directly behind them. Table 3 lists the soils commonly found along the creeks of Arcade and their K-factor

Table 3

Prominent Soil Types and Corresponding K-factor along Cattaraugus and Clear Creeks and their Tributaries (ranked by K-factor, not volume)	
Soil Type (map symbol[s])	K-factor
Allard silt loam (AlA)	0.49
Papakating mucky silt loam (Pm)	0.49
Papakating silt loam (Pk)	0.49
Scio silt loam (ScA)	0.49
Alden mucky silt loam (Ad)	0.37
Tioga silt loam (Tg)	0.37
Wallkill silt loam (Wk)	0.37
Ellery silt loam (Ee)	0.32
Red Hook gravelly loam (Rh)	0.32
Castile gravelly loam (CgA, CgC)	0.24
Chenango gravelly loam (CiA, CiC)	0.24
Erie channery silt loam (EsB, EsC)	0.24
Halsey loam (Ha)	0.24
Langford channery silt loam (LaB, Lac)	0.20
Lansing gravelly silt loam (LaD)	0.20

Source: Wyoming County SWCD, 1999.

4.3 – Floodplain Development

Development within the 100-year floodplain raises flood elevations by obstructing the natural flow of water and increases risk to property and safety. Development in the Village of Arcade is

extensive within the floodplain. There is substantial residential development within the 100-year floodplain.

The village's commercial district is located along Main Street to the south of Cattaraugus Creek extending to the confluence of Cattaraugus and Clear Creeks between Water and Pearl Streets to the east and West Street and Bixby Hill Road to the west. This area also includes industrial and community service establishments.

The Village of Arcade has a floodplain development ordinance, but at present this ordinance does not totally restrict development within the floodplain. An approved 14-lot subdivision on Jackson Avenue falls partially within the floodplain. The development of these lots (currently only one has a structure) will need to be monitored to ensure that future improvements do not increase flood problems.

Further development to the north of Main Street is limited by streambank erosion and steep slopes as result of the close proximity to Cattaraugus Creek.

The primary land uses within the floodplain in the Town of Arcade are agricultural and rural residences with lot sizes greater than ten acres. There are also single-family residences and some mobile homes located in hazard areas, but the majority of parcels within the floodplain are larger lots. This is not the case along NYS Route 98 adjoining the village. To both the north and south of the village there is highway commercial and storage/distribution facilities along with scattered residential development.

There has been little new commercial or industrial development within the town over the past twenty years. However, there has been substantial residential development during the same period.

4.31 – 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. The Committee identified 19 critical facilities in the village and five in the town that lie within the 100-year floodplain.

Village Offices, Police Station, and Arcade Elementary School: located on Church Street south of Cattaraugus Creek. The police operations center and all village offices have repeatedly been flooded during heavy rainfall. Because Church Street slopes downward from Main Street, excess runoff from Park and Prospect Streets results in high water depths along Church Street and limits access to Main Street for police vehicles.

Most floods of severity have occurred during late June and early July when the elementary school has been on recess. However, based on past flood reports, this facility would be at high risk due to flooding thus endangering children where the emergency to occur when school is in session.

Municipal Public Works Garages: The village has two separate public works garages. The Electric and Water department garage is located on Sullivan Avenue to the northwest of Jackson Avenue and South of the railroad tracks.

The Streets and Parks Department garage is located on Mill Street to the west of the Haskell Avenue drainage ditch. According to the FIRM, this garage does not fall within the FEMA designated 100-year floodplain. The Streets and Parks Department garage is included as part of the additional flood hazard areas identified by the Flood Hazard Subcommittee.

The town's Highway Department garage is located along the East Arcade Road portion of NYS Route 98. During the June 26, 1998 flood, waters reached the doors of the garage which are located on a slight upward slope approximately 100 feet from the road. Access to the southern portion of the town is compromised during flooding because, in addition to the flooding of along East Arcade Road, Genesee Road also experiences ponding.

Waste Treatment Plant: Located on Hurdville Road along the western boundary of the village, the waste treatment plant falls within the FIRM-designated 100-year floodplain. In October 1990, a report by the Army Corps of Engineers(ACE) was released regarding streambank erosion along Cattaraugus Creek near the waste treatment plant.

The ACE report found that "Cattaraugus Creek in this reach is subject to flash flooding, high stream velocities, and heavy debris loads during flood periods". (ACE Report CENCB-PE-PC - 1105) These unstable soil conditions threatened to disrupt a sewer line and possibly release untreated sewage into Cattaraugus Creek. As a result of the ACE report, stone rip-rap revetment was placed for several hundred yards along the streambank, road, and sewerline. The project was determined to have no impact on the floodplain and did not raise base flood elevations.

Sewage Pumping Stations: There are two stations located within the Village of Arcade and both lie within the 100-year floodplain. They are located almost directly across from each other with only Cattaraugus Creek separating them. The station to the north is located on North Street to the north of Cattaraugus Creek and the station to the south is located on West Street.

Water Supply Wells: There are two wells located within the village and they are used as backup water supplies to the primary spring fed source. Both wells are located in close proximity to other critical facilities and face the same hazards as these facilities.

The Sullivan Avenue well is located near the Electric and Water Departments' garage. The Church Street well is located behind the village offices. Both wells are relatively shallow with depths between 48 and 50 feet. During the June 26, 1998 flood, the Church Street well had to be shut off to protect against contamination from non-point source pollutants.

In addition, they obtain their water from an unconfined acquifer that has no protective soil layer. This raises even greater concerns regarding possible contamination during flood emergencies when water travels far distances picking up sediment and debris along the way.

A recent Wellhead Protection Study produced by the Wyoming County Department of Economic Development and Planning and Genesee/Finger Lakes Regional Planning Council provides an excellent description and inventory of possible sources of contamination and land uses in the study area.

Child Care Centers: There is a child care facility on Steele Avenue in the eastern portion of the village that could be affected by overland flooding during heavy rainfall.

Bridges: There are eight vehicular bridges and two railroad bridges that traverse Cattaraugus Creek and one vehicular bridge that crosses Clear Creek. The bridges affected are shown below along with the bridges' street elevations, underclearance elevations, and the height of the crest during an intermediate regional (or 100-year) flood. (Old Cattaraugus Road bridge is abandoned.)

Table 4

Arcade Bridges			
Road	Creek	Roadway Surface Elevation*	100-Year Flood Crest Elevation
North Woods Road	Cattaraugus	1415.7	1408.6
West Street	Cattaraugus	1466.1	1464.0
Church Street	Cattaraugus	1477.8	1473.8
Water Street	Cattaraugus	1479.8	1479.4
Genesee Road	Cattaraugus	1516.4	1511.4
East Arcade Road	Cattaraugus	N/A	N/A
Java Lake Road	Cattaraugus	N/A	N/A
Main Street	Clear	1477.6	1478.0
Bray Road	Clear	N/A	N/A

Source: Army Corps of Engineers, July 1968.

NOTE: All elevations are referred to U.S. Coast and Geodetic Datum

* All elevations referred to upstream side of bridge except at Genesee Road

The ACE report that provided these elevations was performed over thirty years ago. Accumulation of debris, shoal, and sediment against the bridges is most likely causing further obstruction of floodwaters at present. Table 4 displays the creek traversed, roadway surface elevation, and base flood crest elevation for the bridges in Arcade.

4.4 - Road Blockages

The ability of persons to evacuate an area and of emergency vehicles to reach those in danger during flooding is paramount to reducing flood hazards. The following information regarding ponding and subsequent road blockages was provided by the village's Public Works Department and the town's Highway Department based on the June 26, 1998 flood.

As could be expected, the streets located near the confluence of Cattaraugus and Clear Creeks were made inaccessible at certain points during the course of the June 26, 1998 flood. Riverine flooding from Cattaraugus Creek inundated North Street to the north at the intersection of West Street and flowed down West Street to the south finally reaching Main Street.

Stormwater runoff accumulated across Main Street at several points between the Arcade & Attica Railroad tracks just to the west of Bixby Hill Road and West Street to the intersection of Maple and East Main Streets. To the east, Park and Mill Streets were also compromised as evacuation routes for residents.

In the eastern portion of the village, ponding occurred along Rule Drive and Edward Streets. The road blockages in this area do not appear to be a result of increased stormwater as a result of riverine flooding. Rather, poor drainage and topography are the most likely reason for the hazard.

In the town, the primary area subject to flooding closed Genesee Road between North Woods Road and Allen Road. The worst flooding was concentrated in an area approximately 500 feet in length located east of the intersection of Route 98 and Genesee Road where the greatest water depth was 5' 2" deep. Runoff from farms located along Genesee Road to the east of Cattaraugus Road caused sediment accumulation across the road.

Other roads where ponding occurred in the town include North Woods Road, Allen Road, Clark Road, Java Lake Road, and Sullivan Road. Table 5 below displays information from the June 26, 1998 flood regarding depths of floodwater, length of road affected, and culvert depths and diameters.

Table 5

Town of Arcade Road Blockages due to Flooding June 26, 1998				
Site Number	Depth Over Road	Length of Road Affected	Road to Pipe Bottom	Pipe Diameter
1. Northwoods Rd.	18"	90'	8'	60"
2. Genesee Rd.	10"	79'	5' 6"	36"
3. Genesee Rd.	15"	187'	8'	48"
4. Genesee Rd.	5"	77'	6' 5"	24"
5. Genesee Rd.	20"	172'	11'	48"
6. Genesee Rd.	22"	230'	13'	60"
7. Genesee Rd.	36"	250'	16'	48"
8. Genesee Rd.	6"	100'	7'	24"
9. Genesee Rd.	12"	183'	12'	two at 36"
10. Allen Rd.	12"	143'	9'	96"
11. Clark Rd.	8"	75'	11'	two at 36"
12. Clark Rd.	4"	52'	6'	18"
13. Java Lake Rd.	16"	350'	6'	18"
14. Sullivan Rd.	20"	492'	14'	96"

Source: Town of Arcade Highway Department, 1999.

4.5 - Flood Warning System

At present, there is no flood warning system in place in either the Village or Town of Arcade. Neither the town, village, nor county has begun developing a warning system for notifying residents of impending flood hazards.

4.6 - County Emergency Management Plan

The Wyoming County Comprehensive Emergency Management Plan outlines "a general all-hazards management guidance, using existing organizations and lines of authority to allow the county to meet its responsibilities before, during, and after an emergency occurs. (*Wyoming County Emergency Management Plan*, ii) The plan stipulates that specific annexes such as this flood mitigation action plan can be attached as a "hazard-specific" annex.

Flooding was determined to possess a significant potential for the creation of hazards within the county. While the plan makes no specific mention of the Village or Town of Arcade, flood-related risks received a high ranking for concern in the county's hazard analysis.

The plan defines the chain of command and hierarchy under which emergency management operation in Wyoming County take place. The primary responsibility to prevent, respond, and aid in recovery during an emergency rests with the municipality. The local jurisdiction must fully utilize all of its own resources before requesting the aid and services of the County Emergency Management Department.

5. – Flood Mitigation Action Plan Goals and Objectives

Goal

- To develop a planning process and adopt a plan that identifies the most effective means of implementing measures to eliminate or reduce the impacts of flood hazards associated with Cattaraugus and Clear Creeks in the Village and Town of Arcade.

Objectives

- ✓ Identify flood hazards and assess the risks associated with those hazards.
- ✓ Involve the public and create awareness and understanding of flood hazards and risks that lead to support for actions to mitigate those risks.
- ✓ Identify and evaluate appropriate mitigation activities to reduce or eliminate the long-term risk of flood damage to structures insurable under the NFIP.
- ✓ Identify and evaluate alternative incentives and resources available to encourage flood mitigation activities.
- ✓ Develop a model planning process that can be used by the Genesee/Finger Lakes Regional Planning Council to assist other communities in the watershed and region in developing flood mitigation action plans.
- ✓ Adopt the flood mitigation action plan and secure approval of the plan by SEMO and FEMA

6. – Flood Mitigation Action Steps

The flood mitigation action items presented here are measures that the Flood Solutions Development Subcommittee (FSDS) has determined will meet the flood mitigation goals set forth by the Committee. The action items attempt to build upon efforts and projects previously undertaken or currently underway.

The action items were developed using a worksheet adapted from the one provided by the Southern Tier Central Regional Planning and Development Board. The action items are divided into six categories:

1. Public Awareness and Information
2. Preventive Measures
3. Natural Resource Protection
4. Property Protection
5. Structural Measures
6. Emergency Services

Each of the activities on the worksheet were ranked low, medium, or high in three categories. These three categories were the interest in pursuing the action, the technical feasibility of the recommendation, and cost effectiveness of such measures. The FSDS then gave each action item an overall ranking of importance based on the three factors in combination. The action items presented here are those that received an overall ranking of high or medium.

6.1 – Public Awareness and 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.

A number of areas were at risk to flooding during the June 26, 1998 flood that are not shown on the FIRM.

Action Items:

- **Copies of the FIRM will be available at the Arcade Free Library, Village Hall, Town Hall, Wyoming County Office of Economic Development and Planning, and the Wyoming County SWCD by the Village Clerk.**

- **Copies of the Letters of Map Amendment (LOMA) will be made available at the same locations by the Town and Village Clerks.**

- **Copies of the Village and Town of Arcade Flood Mitigation Action Plan and map displaying additional flooded areas during the June 26, 1998 flood will be made available at the same locations and updated as future flooding occurs by the Village Clerk.**

  Overall Ranking: High
  Required Expenditures: Minimal
  Time Frame: 2000

Disclosure of flood hazards to potential property owners in Arcade is another important aspect of informing those at risk to flood hazards.

The Wyoming County SWCD currently handles requests from perspective homebuyers regarding the location of the proposed property in relation to the FIRM designated floodzones.

Real estate agents are another important resource in disseminating flood hazards to potential property owners.

Action Items:

- **The Committee will work with SWCD staff to advise people of the SWCD services regarding requests by property owners concerning the location of their property in relation to the FIRM.**

- **The Committee will prepare a package 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.**

  Overall Ranking: Medium
  Required Expenditures: Minimal
  Time Frame: 2000 – 2001

Beyond providing information on the location of properties in relation to the FIRM-designated floodzones, it is important to develop a central clearinghouse of information pertaining to flooding, floodplain management, floodplains as viable natural resources, and techniques for protecting structures from flooding.

FEMA publishes a number of resources related to the topics listed above and makes them available at a minimal, if any, charge to municipalities.

Articles from the *Arcade Herald* and other periodicals detailing past flooding are another important resource in raising public awareness of flooding and floodplain management.

Action Items:

- **The Village Clerk will use the Arcade Free Library as a clearinghouse for resources related to flooding and floodplain management and property protection techniques.**

- **Collect the resources available from FEMA and other sources (many of those used in this report) and catalog them in the library's reference section.**

  Overall Ranking: High
  Required Expenditures: Minimal
  Time Frame: 2000

The provision of technical assistance to property owners is an important component of providing the public with information on reducing flood damages.

The Wyoming County SWCD currently does site visits to review the extent of damage done by flooding. The Village of Arcade Department of Public Works and Town of Arcade Highway Department do site visits to handle drainage and sewer issues. All three agencies provide this service at the request of property owners.

Action Items:

- **The Village Superintendent of Public works will provide information about floodproofing techniques, how to pick a qualified contractor, and the recourse available to them if they are not satisfied with the work as part of the clearinghouse at the Arcade Free Library and in locations where the FIRM is available.**

- **The Committee will inform property owners of the services available from the village, town, and SWCD regarding assessment of damage due to flooding and drainage issues.**

  Overall Ranking: High
  Required Expenditures: Minimal
  Time Frame: 2000

6.2 – Preventive Measures

Floodplain regulations for the village and town are currently in place, but do not completely limit development in the floodplain nor do they require that new structures be built at heights above the base flood elevation.

There are areas in Arcade not shown on the FIRM that are susceptible to flooding during periods of heavy rainfall. The village and town have contacted FEMA regarding revisions to the FIRM and the process is currently underway.

Training for zoning officers and planning board members is provided periodically by the NYSDEC in cooperation with Wyoming County.

Action Items:

- **The Village and Town Boards will review and update the Floodplain Local Laws that were previously adopted.**

- **The Village and Town Boards will consider setting the elevation of new structures (if permitted) at two feet above the base flood elevation.**

- **Zoning officers will take advantage of training when it becomes available.**

  Overall Ranking: High
  Required Expenditures: Minimal
  Time Frame: 2000 – 2001

Zoning plays an important role in reducing flood damages to property and risks to the safety of residents and others by mitigating the adverse effects of properties on adjoining properties.

Action Items:

- **The Village and Town will complete a joint update and create a uniform zoning law for both the Village and Town of Arcade to ensure consistency of development and consideration of floodplain management including:**
  - **Low density zoning**
  - **The model stormwater management regulations developed by the NYSDEC**
  - **Standards for private bridges**
  - **Setback requirements along streambanks**
  - **Standards for driveways and corresponding culverts**
  - **Limit lot sizes for impervious surfaces**

- **The Committee and Planning Board will make recommendations to the Village and Town Boards.**

  Overall Ranking: High
  Required Expenditures: Minimal
  Time Frame: 2000 – 2001

As with zoning, subdivision regulations are another land use control that can be used to prevent increased flood damages.

Action Items:

- **The Village and Town will complete a joint update and create uniform subdivision regulations including the consideration of:**
  - **A "safe building site" above the base flood elevation on each lot**
  - **The placement of roads with respect to base flood elevations**
  - **Require public utilities to be placed above base flood elevations**
  - **Exclude development or encroachment in the floodway**
  - **Include stormwater management regulations to provide for adequate drainage**
  - **Mandate that flood hazard areas be shown on the plat**

Overall Ranking: High
Required Expenditures: Minimal
Time Frame: 2000 – 2001

Preservation of open spaces in flood prone areas offers another preventive action that helps in reducing flood damages by serving as detention areas for floodwaters, particularly where proper vegetation is placed. The costs for projects of this type can often be defrayed, in part, through existing Natural Resource Conservation Service (NRCS) and SWCD sediment and erosion control programs.

Action Items:

- **The Committee will investigate the feasibility of placing vegetative buffers along Cattaraugus Creek, Monkey Run, Spring Brook, Clear Creek and Haskell Creek. Implementation options will be determined.**

Overall Ranking: High
Required Expenditures: Moderate
Time Frame: 2001 – 2010

In addition to stormwater management regulations, the consideration of additional area-wide stormwater management facilities can reduce the long-term risk of flood damage to certain areas of the Village and Town.

Action Items:

- **The Village Superintendent of Public Works and the Town Highway Superintendent will evaluate the feasibility of constructing stormwater management facilities in the following six areas of Arcade:**
  1. **Dry Creek Area**
  2. **East Arcade Road**
  3. **Java Lake Road**
  4. **Clear Creek (near Freedom, NY)**
  5. **Cemetery Ditch on Park Street**

6. Deacon Drive Ditch

- **If feasible, facilities will be designed and constructed, as funding is available.**

  Overall Ranking: High
  Required Expenditures: Moderate to High
  Time Frame: 2001 – 2010

Better-maintained drainage systems can reduce flood hazards and risks by reducing the amount of floodwaters that cause damage by riverine and overland flooding and runoff that affects properties.

Action Items:

- **The Village Board will consider providing additional funding in line items "Storm Sewers" and "Flood and Erosion Control" for drainage system maintenance.**

- **The Town Board will consider adding a line item in the town budget for drainage system maintenance.**

- **The Village Department of Public Works will prepare a drainage system maintenance plan that specifies needs and outlines responsibilities including temporary and permanent easements.**

  Overall Ranking: High
  Required Expenditures: Moderate
  Time Frame: 2001 – 2002

6.3 – Natural Resource Protection

Wetlands serve numerous functions and are useful in detaining water from riverine and overland flooding because of their permeable soils and vegetation that require and hold larger amounts of moisture than other riparian habitats.

Action Items:

- **The Planning Board will evaluate the feasibility of protecting wetlands in the Village and Town of Arcade during site plan and subdivision reviews.**

- **Educational workshops will be provided by the Wyoming County Office of Economic Development and Planning.**

  Overall Ranking: High
  Required Expenditures: Low
  Time Frame: Ongoing

Erosion and sediment control serves the dual purpose of protecting natural resources and mitigating flood hazards and risks. Erosion and sediment loss as a result of new development needs to not only be regulated but also enforced.

Action Items:

- **The Village Superintendent of Public Works and the Town Board will implement erosion and sediment control projects as funding allows (i.e. the Environmental Bond Act) at the following sites:**
  1. **Clear Creek retaining wall – approximately 250 feet of pre-cast cantilever wall with concrete footer and grade control sills.**
  2. **Koike-Aronson, Inc. – approximately 1100 feet of foot high rock rip-rap.**
  3. **Yansick Lumber Company (Cattaraugus Creek) – approximately 1000 feet of 10-foot high rock rip-rap.**
  4. **Agway (Cattaraugus Creek) – repair of approximately 1000 feet of 10-foot high rock rip-rap.**
  5. **Private Residence (Cattaraugus Creek) – approximately 200 feet of 10-foot high rock rip-rap.**
  6. **Other areas as identified.**

  Overall Ranking: High
  Required Expenditures: Moderate
  Time Frame: Ongoing

6.4 – Property Protection

Many of the structures in the village are older having been built in the late 19th and early 20th centuries. Many of these were built without considering flood elevations. The placement and construction of these buildings makes elevation of the structures impossible.

Flood proofing is appropriate for some residences, while acquisition and removal of structures in certain areas would reduce the height of floodwaters and reduce flood risks to nearby properties. The Village of Arcade and Wyoming County have recently applied for funding to remove structures in frequently flooded areas.

Action Items:

- **The Town and Village Boards will encourage property owners to consider floodproofing their properties and attempt to procure funding to defray the costs. Floodproofing would be most appropriate for property owners on Pearl Street, Mill Street, and Park Street.**

- **The Village has determined that the acquisition and removal of certain residences is the most appropriate way to eliminate long-term risk of flood damage. Initially the Village will acquire and remove residences on Water Street (2), Main Street (1)**

and West Street (1) for green space. While not as high a priority, other residences on Main Street and Water Street will also be considered.

Overall Ranking: High
Required Expenditures: Dependent on funding
Time Frame: As soon as possible for targeted acquisitions and removals

Throughout the planning process, the Committee (and the POPS in particular) has attempted to educate property owners about the benefits of NFIP coverage for residences and businesses. The most effective means the town and village have for receiving assistance from FEMA is to increase participation in the NFIP. The work of a local insurance agency has been vital in raising awareness.

Action Items:

- **The Committee will continue to encourage property owners to purchase NFIP coverages for their homes and businesses by maintaining a working relationship with local insurance agents.**

Overall Ranking: High
Required Expenditures: Minimal
Time Frame: Ongoing

FEMA provides for reductions in NFIP premiums in communities based on the completion and adoption of a flood mitigation plan. The NFIP's Community Rating System (CRS) serves as a standardized system for rewarding "communities that have developed viable mapping and regulatory standards for the special hazards in their jurisdictions."

Action Items:

- **After formally adopting the flood mitigation action plan, the Village and Town Boards will submit the flood mitigation action plan for CRS credit and subsequent reductions in NFIP premiums.**

Overall Ranking: High
Required Expenditures: Minimal
Time Frame: 2000

6.5 – Structural Measures

Over time debris and settlement build up throughout stream channels resulting in heightened stream elevations that increase the likelihood of riverine flooding, and intensifying its effects when it does occur.

Permits have been received from the NYSDEC by the SWCD for debris removal in Clear Creek. No permits are required if machinery is not used and there are no significant alterations to fish and wildlife habitats.

Action Items:

- **Regular maintenance of Cattaraugus and Clear Creeks, including removal of trees, sediment, shoal, and other deposits, will be carried out by the Wyoming County SWCD, Village Department of Public Works, and Town Highway Department.**
- **Permits, where necessary, will be procured from the NYSDEC and labor from volunteer groups of residents, AmeriCorps, and Wyoming County Corrections programs may be used.**

Overall Ranking: High
Required Expenditures: Minimal to Moderate
Time Frame: Ongoing

Additional storm sewer capacity through construction of new facilities or upgrading of current ones will also lessen flood hazards and risks by reducing stormwater runoff and the heights of floodwaters due to riverine and overland flooding.

Action Items:

- **The Village Superintendent of Public Works will work with appropriate parties to ensure that storm sewers are installed at the following locations where stormwater runoff produces hazards and risks during flooding (ranked in order of importance):**
    1. **Mill Street from Park Street to Clear Creek**
    2. **Culverts on Liberty Street**
    3. **Route 98 South near Bray Road on town's southern border**
    4. **Park Street from Mill Street to Sullivan Avenue**

- **The Village Superintendent of Public Works will increase the capacity of the following storm sewers (ranked in order of importance):**
    1. **The old post office on Main Street**
    2. **The new firehall on Route 98**
    3. **Church Street at the Village Hall and Pioneer Elementary School**

Overall Ranking: High
Required Expenditures: Moderate to High
Time Frame: 2000 – 2010

As stated earlier, the limited capacity of the pipe under the railroad tracks in the Glenwood Avenue/Haskell Avenue/Deacon Drive area results in overland flooding during heavy rainfall.

Action Items:

- **The Village Superintendent of Public Works will investigate the feasibility of creating a 60-foot berm west of Deacon Drive to help alleviate the runoff due to by the limited capacity of the pipe under the railroad tracks.**

  Overall Ranking: Medium
  Required Expenditures: Moderate
  Time Frame: 2000 – 2002

6.6 – Emergency Services

At present, the National Weather Service does not provide specific reports for Arcade. It is clear that alternative measures need to be found to warn residents of impending flooding to take a more proactive response to flood emergencies.

The current emergency plan for the village and town provides for a command structure, operations center, and other protocol for emergency service providers.

Action Items:

- **The Committee will develop a flood warning system in Arcade with the cooperation of the Wyoming County Office of Emergency Management Services that includes installation of a rain gauge at the Village of Arcade Police Station and possibly marking bridges with critical flood elevations.**

- **Village and Town Board will update the local emergency plan to more thoroughly address flood hazards and risks especially in regards to critical facilities.**

  Overall Ranking: Medium
  Required Expenditures: Minimal
  Time Frame: 2000 – 2005

6.7 - Other Considered Mitigation Activities

In addition to the action items discussed above, other flood mitigation measures were also considered by the FSDS. However, for reasons particular to each one, they were not included in the plan. The list below illustrates other mitigation activities that were considered as action items for the Village and Town of Arcade.

Flood Information Outreach Projects

The planning process utilized for the flood mitigation action plan was two-fold in that it allowed for participation while simultaneously raising residents' awareness of the flooding issues and related hazards and risks through the survey, public meetings, and newspaper coverage of the plan. It was felt that the return on further outreach projects would not be justified when compared with the costs involved.

Other options that were explored included direct mailings containing information concerning floods, inclusion of information in utility bills, and designing special outreach products. In addition, the mandatory disclosure of flood problems on properties by real estate agents was another measure that was considered. The regulation and enforcement of such a measure was viewed to be too costly compared with the benefits it would provide.

Other forms of environmental education programs for children and adults were considered, but it was determined that their effect would be minimal in comparison to the time and resources needed to organize and conduct such programs. The Wyoming County SWCD currently conducts conservation field days for elementary school students and is willing to include flood education.

Preventive Activities

The FSDS focused largely on preventive, non-structural measures to reduce the flood hazards and risks in the Village and Town of Arcade. Therefore, the majority of measures available for preventive activities to mitigate flood hazards were included as specific action items. The following are measures discussed but not determined to be appropriate for Arcade.

A preventive activity discussed was the elevation of existing structures throughout the village and town above base flood elevations. However, given the location and design of the large majority of buildings in Arcade, this option was not found to be feasible or cost-effective.

The use of cluster development regulations in zoning and subdivision ordinances or as a separate ordinance was discussed. The FSDS decided that cluster development was not appropriate and would have little effect in reducing the flood hazards in the Arcade.

Natural Resource Protection

An additional natural resource protection measure discussed but not included as an action item was the inclusion of flood considerations in agricultural best management practices. The Wyoming County SWCD currently produces agriculture plans for local farmers and many of these do consider potential problems resulting from flooding. The FSDS ranked the measure as low in interest in implementing and cost-effectiveness, but high in technical feasibility.

Property Protection

The only measures not developed into specific action items in this category were the relocation and elevation of certain structures in the floodzone and acquisition of undeveloped floodzone property. Relocation and elevation were deemed not to be cost-effective. The acquisition of undeveloped properties in the floodplain was not possible due to the lack of undeveloped property in the floodplain, particularly in the village.

Structural Projects

As stated earlier, the FSDS attempted to focus on non-structural measures because of the benefits they produce in other facets of environmental protection and because of the high construction and maintenance costs involved with structural projects.

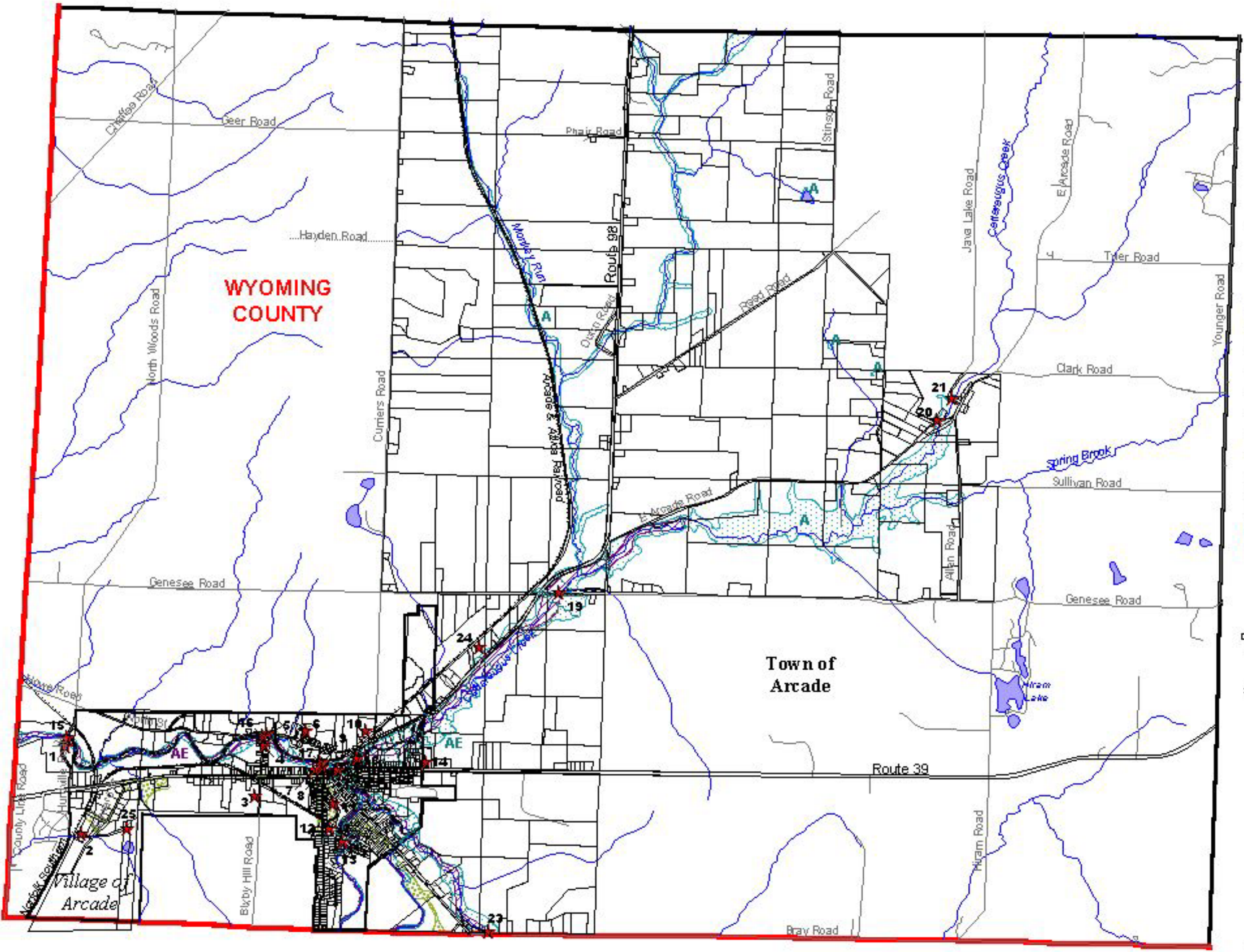
Reservoirs, levees, floodwalls, straightening of stream channels, and high flow diversion measures were all found to have too high of a cost in comparison with the return they would have in alleviating or reducing flood hazards and risks.

Emergency Services

Automated rain and stream level gauges were considered by the FSDS. However, the introduction and monitoring of manual gauges were considered more cost effective. Critical facilities were also examined for possible relocation or elevation, but the benefits of each were greatly outweighed by the costs.

Town & Village of Arcade Flood Mitigation Action Plan

Town and Village of Arcade



★ Critical Facilities

FIRM Designated

- Base Flood Elevation Line
- 100-Year Floodplain
- Floodway Area
- Additional Flooded Areas June 26, 1998
- Tax Parcel
- Highway
- Road
- Private Road
- Railroad
- Hydrography
- Village Boundary
- Town Boundary
- County Boundary

0 0.5 1 Miles

Source: TIGER/Line File, U.S. Bureau of the Census, 1992

Flood Insurance Rate Map, Federal Emergency Management Agency, 1992

Wyoming County Economic Development and Planning, 1999

Douglas C. Myers, Professional Land Surveyor, 1999

Arcade Flood Mitigation Planning Committee, 1999

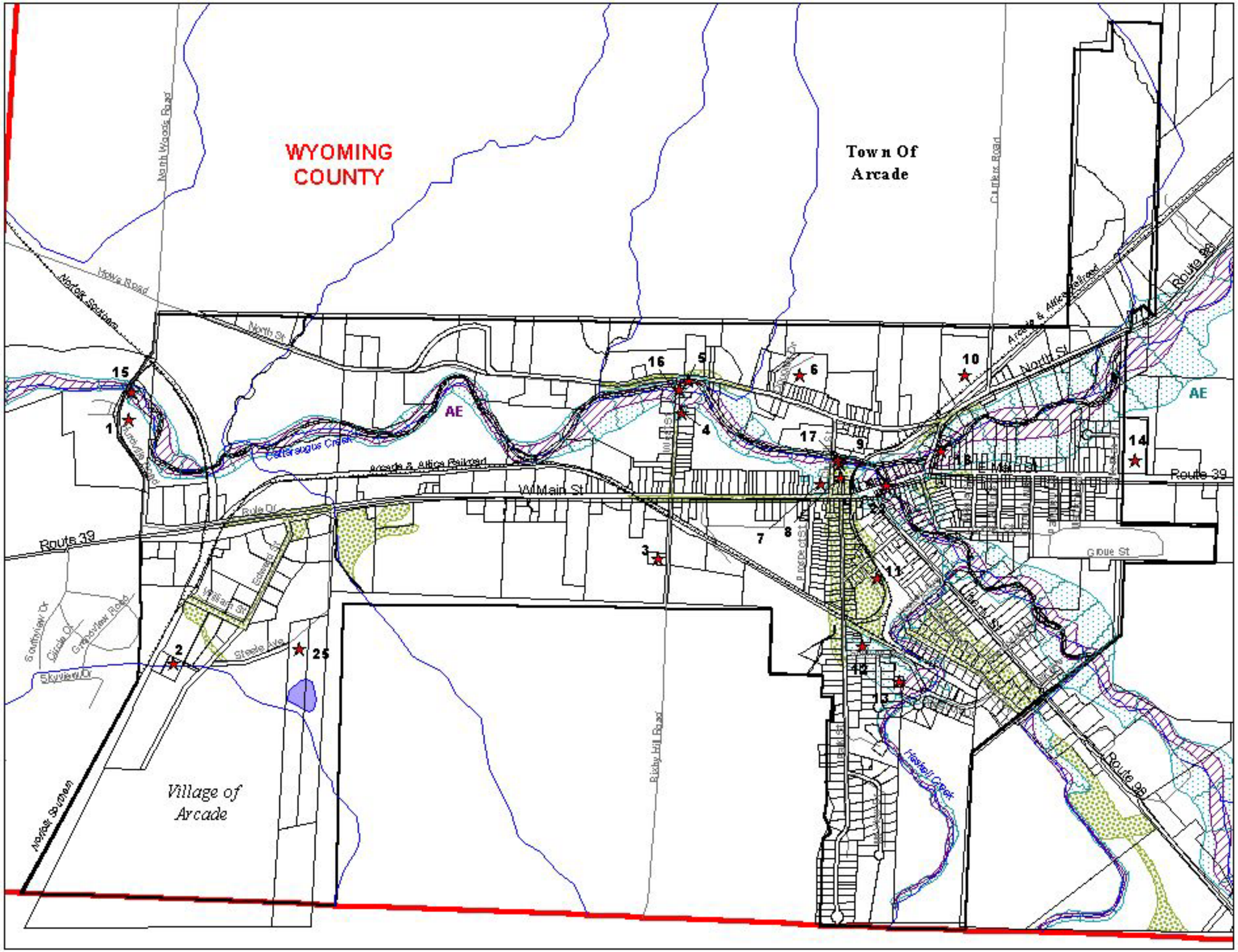
Flood Hazard Assessment Subcommittee, 1999

Public Outreach/Participation Subcommittee, 1999

Prepared by Genesee/Finger Lakes Regional Planning Council, August 20, 1999

Town & Village of Arcade Flood Mitigation Action Plan

Village of Arcade Detail



★ Critical Facilities

FIRM Designated
- Base Flood Elevation Line
- 100-Year Floodplain
- Floodway Area

Additional Flooded Areas June 26, 1998

- Tax Parcel
- Highway
- Road
- Railroad
- Hydrography
- Village Boundary
- Town Boundary
- County Boundary

0 800 1600 Feet

Source: TIGER/Line File, U.S. Bureau of the Census, 1992

Flood Insurance Rate Map, Federal Emergency Management Agency, 1992

Wyoming County Economic Development and Planning, 1999

Douglas C. Myers, Professional Land Surveyor, 1999

Arcade Flood Mitigation Planning Committee, 1999

Flood Hazard Assessment Subcommittee, 1999

Public Outreach/Participation Subcommittee, 1999

Prepared by Genesee-Finger Lakes Regional Planning Council, August 20, 1999

Town and Village of Arcade Flood Mitigation Action Plan

Key of Critical Facilities

ID	Facility
1	Wastewater Treatment Plant
2	Industrial Park Substation
3	Bixby Hill Substation
4	West Street Sewage Pumping Station
5	North Street Sewage Pumping Station
6	Adult Living Apartments
7	Pioneer Elementary School
8	Villlage Offices and Police Station
9	Church Street Well
10	Village Fire Station
11	Streets & Parks Department Garage
12	Electric & Water Department Garage
13	Sullivan Avenue Well
14	Adult Living Apartments
15	North Woods Road Bridge
16	West Street Bridge
17	Church Street Bridge
18	Water Street Bridge
19	Genesee Road Bridge
20	East Arcade Road Bridge
21	Java Lake Road Bridge
22	Main Street Bridge
23	Bray Road Bridge
24	Town Highway Department Garage
25	Child Care Facility

Appendix A
Residential / Agricultural & Commercial / Industrial Surveys

VILLAGE AND TOWN OF ARCADE
FLOOD MITIGATION STUDY

FLOOD DAMAGE INFORMATION
JUNE/JULY 1998 FLOOD
RESIDENTIAL/AGRICULTURAL

Property Address _____

How long have you owned this property/lived at this address? _____ Years

Does a creek flow through your property? Yes ___ No ___

Distance to closest Creek _____ Ft.

Were you flooded at this address? _____

Source of floodwater Cattaraugus Creek _____

Clear Creek _____

Other _____

Depth of water Basement _____ Ft

First floor _____ Ft

Garage _____ Ft

Other _____ Ft

Structural damage (approximate)

$_____

Damage to Contents (approximate) Basement

$_____

First Floor $_____

Garage

$_____

Property (landscaping, etc.)

$_____

How much lost time did you experience?

_____

Do you have Flood Insurance? Yes ___No ___ If not, why not

_____

Did you receive assistance from: FEMA Yes ___ No ___

Flood Insurance Yes ___ No ___

Other Insurance Yes ___ No ___

Other Sources Yes ___ No ___

Describe clean up activity

_____

_____

_____

How many other times (and when) have you been flooded at this address?

_____

_____

Provide any additional information about the flood on the back of this form

VILLAGE AND TOWN OF ARCADE
FLOOD MITIGATION STUDY

FLOOD DAMAGE INFORMATION
JUNE/JULY 1998 FLOOD
COMMERCIAL/INDUSTRIAL

Property Address

_____

Type of business

_____

How long have you owned this property? _____ Years

Does a creek flow through your property?Yes ___ No ___

Distance to closest Creek_____ Ft.

Were you flooded at this address? _____

Source of floodwater Cattaraugus Creek _____

Clear Creek _____

Other _____

Depth of water Basement _____ Ft

First floor _____ Ft

Other _____ Ft

Structural damage (approximate)

$_____

Damage to Contents (approximate) Equipment

$_____

Inventory

$_____

Property (landscaping, etc.)

$_____

How much lost time did you experience?

_____

Do you have Flood Insurance? Yes ___No ___ If not, why not

_____

Did you receive assistance from: FEMA Yes ___ No ___

Flood Insurance Yes ___ No ___

Other Insurance Yes ___ No ___

Other Sources Yes ___ No ___

Describe clean up activity

_____

_____

_____

How many other times (and when) have you been flooded at this address?

_____

_____

Provide any additional information about the flood on the back of this form

Please return this form by March 31, 1999

Please return this form as soon as possible

Appendix B
Flier for Public Outreach / Participation Meetings

Not available in digital format
For information on this appendix contact the Genesee/Finger Lakes Regional Planning Council

Appendix C
Newspaper Articles

Not available in digital format
For information on this appendix contact the Genesee/Finger Lakes Regional Planning Council

Appendix D
Flood Hazard Areas Matrix

Village and Town of Arcade - Flood Hazard Areas

Hazard Area	Riverine Source of Flooding	Town (T) and/or Village (V)	Residential Parcels Affected	Commercial & Industrial Parcels Affected	Vacant Parcels Affected	Agricultural Parcels Affected	Community/Public Service Parcels Affecte	Riverine Flooding	Flood Hazards from Runoff	Critical Facilities Present
North Woods Rd./Hurdville Rd.	Cattaraugus Creek	T & V	1	0	3	1	1	X	X	X
North Street/NYS Route 98	Cattaraugus Creek	V	10	2	7	0	0	X	X	X
Pearl Street	Cattaraugus and Clear Creeks	V	12	0	0	0	0	X		
Liberty Street	Cattaraugus and Clear Creeks	V	23	8	3	0	0	X		
West Street	Cattaraugus Creek	V	8	0	0	1	0	X		X
Deacon Drive	Haskell Creek	V	10	0	0	0	0	X	X	
Water Street	Cattaraugus Creek	V	7	0	1	0	0	X		X
Sherman Drive	Cattaraugus Creek	V	7	0	1	0	0	X		
Haskell Avenue	Haskell Creek	V	11	1	0	0	0	X	X	
Jackson Avenue (Subdvision)	Haskell Creek	V	1	0	13	0	0	X		
Sullivan Avenue	Haskell Creek	V	4	1	1	0	0	X	X	X
Church Street	Cattaraugus Creek	V	0	1	1	0	3	X	X	X
Clough Avenue	Clear Creek	V	1	0	0	1	0	X	X	
Park Street	Haskell Creek	V	5	0	1	0	0	X	X	
Glenwood Drive	Haskell Creek	V	5	0	0	0	0	X	X	
Stuart Avenue	Clear Creek	V	3	0	0	0	1	X	X	
Sanford Avenue	Cattaraugus Creek	V	0	1	0	0	0	X		
Grove Street	Clear Creek	V	1	0	1	0	0	X		
Maple Street	Cattaraugus and Clear Creeks	V	1	0	0	0	0	X		
Clearview Drive	Clear Creek	V	1	0	0	0	0	X		

Village and Town of Arcade - Flood Hazard Areas

Hazard Area	Riverine Source of Flooding	Town (T) and/or Village (V)	Residential Parcels Affected	Commercial & Industrial Parcels Affected	Vacant Parcels Affected	Agricultural Parcels Affected	Community/Public Service Parcels Affecte	Riverine Flooding	Flood Hazards from Runoff	Critical Facilities Present
Mount View Drive	Haskell Creek	V	1	0	0	0	0	X		
Main Street	Cattaraugus and Clear Creeks	V	31	29	1	1	2	X	X	X
NYS Route 98 (Cattaraugus Rd.)	Monkey Run Creek	T	8	0	5	10	0	X		
NYS Route 98 (E. Arcade Road)	Cattaraugus Creek	T	6	2	1	0	1	X	X	X
NYS Route 98 (Liberty Street)	Clear Creek	T	5	3	2	3	2	X		
Genesee Road	Cattaraugus Creek	T	2	0	3	3	0	X	X	
Reed Road	Monkey Run Creek	T	1	0	1	1	0	X		
Allen Road	Cattaraugus Creek	T	2	0	0	0	0	X		
Bray Road	Clear Creek	T	1	0	1	0	1	X		
Stinson Road	Cattaraugus Creek	T	1	0	0	0	0	X		
Phair Road	Cattaraugus Creek	T	0	0	0	1	0	X		
NYS Route 39	Cattaraugus Creek	T	0	0	0	2	0	X	X	
Curriers Road	Monkey Run Creek	T	1	0	0	3	0	X		

Appendix E
Structures and Lots Surveyed

Village and Town of Arcade Flood Mitigation Action Plan

The following structures and points were surveyed to determine ground and first-floor elevations. The lots and structures were chosen based on their location within the floodplain and their responses to the survey sent to them by the Public Outreach and Participation Subcommittee. The information was used to identify the elevations of structures frequently flooded in Arcade to 1.) determine flood heights and 2.) what areas not shown on the FIRM were likely to be flooded.

Location	Ground Elevation	First-Floor Elevation
638-654 West Main Street	1456.71	1460.25
506 West Main Street	1471.35	1474.44
79-81 West Street	1462.69	1466.76
354 North Street	1490.75	1493.01
296 Main Street	1480.26	1484.56
52 Park Street	1483.66	1487.68
62 Mill Street	1484.90	1487.30
258 Park Street	1658.98	1663.71
248 Main Street	1479.14	1481.25
7 Sullivan Avenue	1496.80	1500.90
60 Liberty Street	1484.54	1488.25
32 Haskell Avenue	1495.12	1498.66
24 Water Street	1478.55	1479.53
45 Pearl Street	1480.81	1483.27
149 Main Street	1505.75	1509.75
54 Grove Street	1483.93	1485.73
52 Haskell Avenue	1496.01	1499.52
6 Clearview Drive	1495.07	1498.29
118 North Street	1488.10	1490.40
9 Water Street	1478.33	1480.48
8 Sherman drive	1489.41	1491.39
3 Sherman Drive	1488.90	1491.20
12 Madison Avenue	1493.15	1495.56
15 Parkview Court	1489.58	1492.34
5 Water Street	1478.33	1481.04

Key Elevation Points	Elevation
Genesee Rd & Route 98	15151.13
West Street Bridge	1464.12
Hurdville Rock Ledge	1409.60
Arcade Police Department	1474.26
Doug C. Myers PLS PC Office, 235 Main Street	1477.01

Source: Douglas C. Myers, Professional Land Surveyor P.C., 1999

Village and Town of Arcade - Flood Hazard Areas

Hazard Area	Riverine Source of Flooding	Town (T) and/or Village (V)	Residential Parcels Affected	Commercial & Industrial Parcels Affected	Vacant Parcels Affected	Agricultural Parcels Affected	Community/Public Service Parcels Affecte	Riverine Flooding	Flood Hazards from Runoff	Critical Facilities Present
North Woods Rd./Hurdville Rd.	Cattaraugus Creek	T & V	1	0	3	1	1	X	X	X
North Street	Cattaraugus Creek	V	10	2	7	0	0	X	X	X
Pearl Street	Cattaraugus and Clear Creeks	V	12	0	0	0	0	X		
Liberty Street	Cattaraugus and Clear Creeks	V	23	8	3	0	0	X		
West Street	Cattaraugus Creek	V	8	0	0	1	0	X		X
Deacon Drive	Haskell Creek	V	10	0	0	0	0		X	
Water Street	Cattaraugus Creek	V	7	0	1	0	0	X		X
Sherman Drive	Cattaraugus Creek	V	7	0	1	0	0	X		
Haskell Avenue	Haskell Creek	V	11	1	0	0	0		X	
Jackson Avenue (Subdvision)	Haskell Creek	V	1	0	13	0	0	X		
Sullivan Avenue	Haskell Creek	V	4	1	1	0	0	X	X	X
Church Street	Cattaraugus Creek	V	0	1	1	0	3	X	X	X
Clough Avenue	Clear Creek	V	1	0	0	1	0	X	X	
Park Street	Haskell Creek	V	5	0	1	0	0	X	X	
Glenwood Drive	Haskell Creek	V	5	0	0	0	0		X	
Stuart Avenue	Clear Creek	V	3	0	0	0	1	X	X	
Sanford Avenue	Cattaraugus Creek	V	0	1	0	0	0	X		
Grove Street	Clear Creek	V	1	0	1	0	0	X		
Maple Street	Cattaraugus and Clear Creeks	V	1	0	0	0	0	X		

Village and Town of Arcade - Flood Hazard Areas

Hazard Area	Riverine Source of Flooding	Town (T) and/or Village (V)	Residential Parcels Affected	Commercial & Industrial Parcels Affected	Vacant Parcels Affected	Agricultural Parcels Affected	Community/Public Service Parcels Affecte	Riverine Flooding	Flood Hazards from Runoff	Critical Facilities Present
Clearview Drive	Clear Creek	V	1	0	0	0	0	X		
Mount View Drive	Haskell Creek	V	1	0	0	0	0	X		
Main Street	Cattaraugus and Clear Creeks	V	31	29	1	1	2	X	X	X
NYS Route 98 North	Monkey Run Creek	T	18	2	6	10	1	X	X	X
NYS Route 98 South	Clear Creek	T	5	3	2	3	2	X		
Genesee Road	Cattaraugus Creek	T	2	0	3	3	0	X	X	
Reed Road	Monkey Run Creek	T	1	0	1	1	0	X		
Allen Road	Cattaraugus Creek	T	2	0	0	0	0	X		
Bray Road	Clear Creek	T	1	0	1	0	1	X		
Stinson Road	Cattaraugus Creek	T	1	0	0	0	0	X		
Phair Road	Monkey Run Creek	T	0	0	0	1	0	X		
NYS Route 39	Cattaraugus Creek	T	0	0	0	2	0	X	X	
Curriers Road	Monkey Run Creek	T	1	0	0	3	0	X		