Hazard Mitigation Plan

Prepared for:
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Executive Summary

After suffering the effects of floods, tornadoes, winter storms, and other natural and man-made hazards, the citizens, business leaders, and officials of Clearfield County recognized the need to develop a long-term approach to reducing their vulnerability to hazards. In 2003, the Clearfield County hazard mitigation planning committee, the local leadership for an initiative to promote communities' resistance to natural and human-caused hazards, began a hazard mitigation planning process to identify the hazards that can affect the County and create a strategy to reduce damage from these hazards. The Committee identified the hazards most threatening to the County and then determined a series of prioritized actions necessary to reduce potential damages from these hazards.

This document, the **Clearfield County Hazard Vulnerability Assessment and Mitigation Plan**, represents the work of citizens, elected and appointed government officials, business leaders, and volunteers of non-profit organizations to develop a plan that will serve as a blueprint for protecting community assets, preserving the economic viability of the community, and saving lives. Endorsed by the Federal Emergency Management Agency (FEMA) and the Pennsylvania Emergency Management Agency (PEMA), the hazard mitigation planning process and the plan will help the County implement its mitigation projects.

The hazard mitigation planning process consisted of:

- Public involvement through a series of meetings;
- Identification of hazards that could affect the County;
- Assessment of the County's vulnerability to these hazards in terms of the number of structures, critical facilities, and people affected;
- Identification of mitigation actions that can reduce the risk from these hazards; and
- Development of an implementation strategy identifying roles and responsibilities.

No plan can succeed without the support of the community. Because of the diversity of interests in the County and municipalities, the Committee encouraged public input throughout the planning process, allowing citizens a voice in the decisions that will affect their future.

Section One: Hazard Vulnerability Assessment describes each hazard's occurrence and effects in the Commonwwealth of Pennsylvania and in Clearfield County and identifies the effects of natural or human-caused hazard events by estimating the exposure of people, buildings, and infrastructure to hazardous conditions. Natural hazards that can affect Clearfield County and deserve detailed study are included in the plan as follows:

- Flooding;

- Tornadoes and Wind Storms;
- Other Severe Weather; and
- Land Failure.

The follow table summarizes which municipalities are at greatest risk for the various hazards (listed in descending order of vulnerability within each hazard):

Hazard	Municipalities at Greatest Risk	Basis
Flooding	Lawrence, DuBois, Decatur, Coalport, Clearfield, Sandy, and Beccaria.	Number of structures in 100-year floodplain with extreme depth of flooding
Tornadoes and Wind Storms	DuBois, Lawrence, Sandy, Decatur, Bradford, and Morris.	NCDC data (DuBois only), number of residential and commercial trailers
Winter Storms and Other Severe Weather	All municipalities are essentially at equal risk, although weather impacts may vary somewhat according to topography and other factors.	Not applicable
Land Failure	Sandy, Lawrence, Curwensville, Huston	Number of structures in hazard area

Section Two: Mitigation Capability Assessment evaluates the resources that the County goals can access to implement hazard mitigation initiatives.

Section Three: Mitigation Goals and Objectives presents goals and objectives to guide the hazard mitigation activities.

Section Four: Alternative Mitigation Actions evaluates alternative actions to address the identified vulnerability to natural hazards and to achieve the goals and objectives.

Section Five: Mitigation Plan and Implementation Strategy contains prioritized actions accompanied by details about the responsible organizations, estimated costs, possible funding sources and the timeline for implementation. This section concludes with a discussion of Monitoring, Evaluation and Updating which recommends establishing a permanent hazard mitigation team to effectively lead the implementation of the plan and continuation of the hazard mitigation planning process beyond this Plan.

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List of Acronyms

BFE	Base flood elevation
CRS	Community Rating System
DEP	(Pennsylvania) Department of Environmental Protection
DCNR	(Pennsylvania) Department of Conservation of Natural Resources
DMA	Disaster Mitigation Act of 2000
DOT	Department of Transportation
EMA	Emergency management agency
FEMA	Federal Emergency Management Agency
FIRM	Flood insurance rate map
FMA	Flood Mitigation Assistance Program
GIS	Geographic information system
HMPC	Hazard mitigation planning committee
mph	Miles per hour

N/A	(Data) not available
NCDC	National Climatic Data Center
NFIP	National Flood Insurance Program
PA	Pennsylvania
PASDA	Pennsylvania spatial data access (web site)
PEMA	Pennsylvania Emergency Management Agency
PGA	Peak ground acceleration
PGS	Pennsylvania Geological Survey
RL	Repetitive (flood) loss
SARA	Superfund Amendments and Reauthorization Act
SALDO	Subdivision and Land Development Ordinance
US	United States (of America)
USEPA	United States Environmental Protection Agency

Introduction

Purpose

Across the United States, natural disasters have led to increasing levels of deaths, injuries, property damage, and interruption of business and government services. The time, money, and efforts to recover from these disasters exhaust resources, diverting attention from important public programs and private agendas. With 20 statewide or county-specific gubernatorial and presidential disaster declarations since 1966, the emergency management community, citizens, elected officials, and other stakeholders in Clearfield County, Pennsylvania recognized the impact of disasters on their community and concluded that proactive efforts needed to be taken to reduce the impact of natural hazards.

Hazard mitigation is a phrase that describes actions taken to prevent or reduce the long-term risks to life and property from hazards. Pre-disaster mitigation actions are taken in advance of a hazard event and are essential to breaking the typical disaster cycle of damage, reconstruction, and repeated damage. With careful selection, mitigation actions can be long-term, cost-effective means of reducing the risk of loss.

Accordingly, the Clearfield County Hazard Mitigation Planning Committee (HMPC), composed of governmental leaders from Clearfield County and federal and State representatives, in cooperation with the elected officials of the County and its municipalities, has sponsored and prepared this Hazard Vulnerability Assessment and Mitigation Plan. The Plan is the result of over a year's work by the citizens of the County to develop a pre-disaster multi-hazard mitigation plan that will not only guide the County towards greater disaster resistance, but will also respect the character and needs of the community.

In order to qualify for federal aid for technical assistance and post-disaster funding, local jurisdictions must comply with the Disaster Mitigation Act of 2000 (DMA) and its implementing regulations (44 CFR §§201.6, published February 26, 2002). The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been prepared to meet FEMA and PEMA requirements in order for the County to be eligible for funding and technical assistance from state and federal hazard mitigation programs.

About Clearfield County

Clearfield County was created in 1804 from parts of Huntington and Lycoming Counties. The County is located in central Pennsylvania and covers 1,147 square miles. Clearfield County has a population of 83,382 with 51 political subdivisions, including 1 city (third class), 20 boroughs and 30 townships. Du Bois City, Sandy Township, Clearfield Borough and Lawrence Township are the County's principal population centers with

about 34,000 residents.

In addition to its agriculture production and associated commercial activities, the county is also the site of other significant business and industrial operations. The county has an extensive network of major highways, including US Interstate 80 (which bisects the County west to east), US routes 322 and 219, and PA routes 879, 153 and 53.

Planning Process

Clearfield County Hazard Mitigation Planning Committee

The County's hazard mitigation planning committee (HMPC) currently consists of the following members:

Chuck Failing	County GIS Department
Meredith Krejny	County Department of Planning and Development
Jodi McCluskey	County Department of Planning and Development
Bill Swatsworth	County Department of Emergency Services
Melanie Voris	County Department of Emergency Services

Bill Swatsworth serves as chairman of the committee.

The HMPC members identified as one of the most important priorities the development of a hazard mitigation plan to identify the hazards that affect the County, assess the likely damage from those hazards, select actions to address the County's vulnerability to such hazards, and develop an implementation-strategy action plan to implement these measures. To aid in the development of the plan, HMPC contracted the services of URS Corporation, a consulting firm with expertise in hazard mitigation planning.

The County HMPC met several times from March 2003 to August 2004; all meetings were open to the public. The committee is fully involved in the planning process, and their input has been vital to the success of developing a countywide mitigation plan. The HMPC participated in the planning process as follows:

Table i. HMPC Meetings/Activities

Date	Event
February 26, 2003	First committee meeting
April 17, 2003	In-progress review meeting
June 9, 2003	In-progress review meeting
October 2, 2003	In-progress review meeting
October 20, 2003	Mass mailout to municipalities
March 18, 2004	Meeting with local emergency management coordinators
August 2004	Presentation of revised hazard mitigation plan to Commissioners

Public Involvement

The HMPC hosted a series of meetings during 2003 and 2004 to educate stakeholders about their risks, involve them in identifying issues, and educate them about alternative mitigation actions. The meetings included:

- April 17, 2003: presentation to County staff about the hazard mitigation planning process and the draft hazard identification. Topics included hazard mitigation planning and its benefits, steps in the hazard mitigation planning process, and the hazards identified along with the associated risks.

- June 9, 2003: formal in-progress review meeting where draft hazard vulnerability assessment was presented, along with a draft goals and objectives for hazard mitigation planning.

- October 2, 2003: formal in-progress review meeting where hazard vulnerability assessment was finalized, and draft hazard mitigation actions were developed.

- March 18, 2004: meeting with local emergency management coordinators to prioritize the hazard mitigation actions.

- August 2004: Public Hearing to present the revised plan to the Clearfield County Commissioners for consideration of adoption.

Further documentation on these meetings can be found in Appendix H. The Clearfield County HMPC informed residents about these meetings through various means, including newsletters and the County web site (http://www.clearfieldco.org).

Local, State and Federal agencies, local businesses, community leaders, educators, and other relevant private and nonprofit interests groups were given the opportunity to participate in the plan development in the same manner as residents – through newspaper announcements, public meetings, and the County web site. Furthermore neighboring communities were notified in writing of the plan development (see Appendix I).

Multi-Jurisdictional Approach

Clearfield County took a multi-jurisdictional approach to preparing its hazard mitigation plan. The County had resources (e.g., funding, data, GIS, etc.) which local jurisdictions lacked. However, the County could not develop the plan on its own. To undertake such a regional planning effort, the County needed to involve its member municipalities since only they have the legal authority to enforce compliance with land use planning and development issues. The County undertook an intensive effort to involve all 51 municipalities (30 townships, 20 boroughs, and one city) in the planning process. The

following municipalities have participated in the development of this plan and have each adopted the plan which includes mitigation action items specific to each jurisdiction:

Table ii. Municipal Participation

Jurisdiction	Types of Participation	Plan Adoption Date
Beccaria Township	Each township and borough was given multiple opportunities to participate in this process, such as: • Invited to the HMPC meetings; • Sent a copy of the draft vulnerability assessment and mitigation actions for comment; • Invited to a meeting to review and prioritize the mitigation actions; and • Given a access to the draft plan for review and comment.	August 3, 2004
Bell Township		August 7, 2004
Bradford Township		August 3, 2004
Brady Township		August 2, 2004
Brisbin Borough		August 9, 2004
Chest Township		August 12, 2004
Chester Hill Borough		August 10, 2004
Clearfield Borough		August 19, 2004
Coalport Borough		August 2, 2004
Cooper Township		August 19, 2004
Covington Twnship		August 5, 2004
Curwensville Boro		August 9, 2004
DuBois (City of)		August 9, 2004
Falls Creek Boro		August 2, 2004
Ferguson Township		August 3, 2004
Girard Township		August 12, 2004
Glen Hope Boro		August 9, 2004
Graham Township		August 9, 2004
Greenwood Twsp.		August 2, 2004
Gulich Township		August 5, 2004
Houtzdale Borough		August 9, 2004
Huston Township		August 3, 2004
Irvona Borough		August 5, 2004
Karthaus Township		August 9, 2004
Knox Township		August 2, 2004
Lawrence Township		August 3, 2004
Lumber City Boro		August 9, 2004
Morris Township		August 4, 2004
New Washington Boro		August 2, 2004
Penn Township		August 3, 2004
Pike Township		August 4, 2004
Pine Township		August 25, 2004
Ramey Borough		August 9, 2004
Sandy Township		August 2, 2004
Union Township		August 10, 2004
Wallaceton Boro		August 3, 2004
Westover Borough		August 10, 2004

Note that part of Falls Creek Borough is in Jefferson County; this plan only addresses the risks to Clearfield County residents. Falls Creek Borough residents will need to adopt both the Clearfield County and Jefferson County hazard mitigation plans.

Regulatory Compliance

The planning process and the plan itself allow Clearfield County and its participating municipalities to establish a foundation for future mitigation activities, capitalize upon implementation resources and opportunities, and implement life-and property-saving mitigation measures.

The plan components address the local hazard mitigation planning requirements of the Disaster Mitigation Act of 2000. The following cross-reference indicates what sections of the plan address specific requirements in the Interim Final Rule, the regulation implementing DMA 2000.

Table iii. FEMA Plan Review Criteria and Corresponding Clearfield County Plan Sections

FEMA Review Criteria	Clearfield County Hazard Vulnerability Assessment and Mitigation Plan
Prerequisite • Adoption by the Local Governing Body (§201.6(c)(5)) • Multi-jurisdiction Plan Adoption (§201.6(c)(5)) • Multi-jurisdictional Participation (§201.6(a)(3))	• NA (applies to single jurisdiction) • Resolutions of Adoption • Introduction
Planning Process Documentation of Planning Process (§201.6(c)(1))	Introduction
Risk Assessment • Identifying Hazards (§201.6(c)(2)(i))) • Profiling Hazard Events (§201.6(c)(2)(i)) • Assessing Vulnerability: Identifying Assets (§201.6(c)(2)(ii)(A)) • Assessing Vulnerability: Estimating Potential Losses[1] (§201.6(c)(2)(ii)(b)) • Assessing Vulnerability: Analyzing Development Trends (§201.6(c)(2)(ii)(c)) • Multi-jurisdictional Risk Assessment (§201.6)(c)(2)(iii))	• Section One: Hazard Identification and Vulnerability Assessment

[1] Criteria highlighted in gray are not required by the DMA 2000 Interim Final Rule; however, FEMA highly encourages communities to address such criteria in the plan. Detailed loss estimation is not included in this plan due to data limitations. Receiving a less than satisfactory score on such elements will not prevent the plan from being approved.

FEMA Review Criteria	Clearfield County Hazard Vulnerability Assessment and Mitigation Plan
Mitigation Strategy • Local Hazard Mitigation Goals (§201.6(c)(3)(i)) • Identification and Analysis of Mitigation Measures (§201.6(c)(3)(ii)) • Implementation of Mitigation Measures (§201.6(c)(3)(iii)) • Multi-jurisdictional Mitigation Strategy (§201.6(c)(3)(iv))	• Section Two: Mitigation Goals and Objectives • Section Three: Alternative Mitigation Actions • Section Four: Mitigation Plan and Implementation Strategy • Section Four: Mitigation Plan and Implementation Strategy
Plan Maintenance Procedures • Monitoring, Evaluating, and Updating the Plan (§201.6(c)(4)(i)) • Implementation Through Existing Programs (§201.6(c)(4)(ii)) • Continued Public Involvement (§201.6(c)(4)(iii))	• Section Four: Mitigation Plan and Implementation Strategy

About This Document

Section One: Hazard Identification and Profiles identifies the hazards that may affect Clearfield County and defines them in terms of their previous events, likelihood of occurrence, physical characteristics, and the potential severity of such an occurrence.

Hazard identification involves investigating the existence of certain types of natural conditions in and around the County to reveal the hazards that may affect it. Features like topology, soil and rock types, hydrology, and seismology not only determine which hazards the County will experience, but also determine the impact of hazards on people, structures, and infrastructure. The incidence of a past hazard event in the County is a good determinant of future possible incidence. Consequently, hazard identification first determines whether the hazard has occurred previously. Next a hazard profile is developed to determine the frequency or probability of future events, and the characteristics of the hazard as it occurs in the County, including its severity and factors in the County that may exacerbate the severity.

The vulnerability assessment identifies the effects of a natural hazard event by estimating the exposure of people, buildings, and infrastructure to hazardous conditions. The assessment allows the County and its municipalities to focus attention to areas most likely to be damaged or most likely to require early response activity during a hazard event, helping to set mitigation priorities. Depending upon the data available, a vulnerability analysis involves counting the number of structures or people in the path of hazards or describing what these hazards can do to physical, social, and economic assets. The vulnerabilities identified in this section consist of an inventory of affected structures completed primarily using GIS software to overlay the hazard areas with the location of

structures.

Estimating losses in hazard events requires a full range of information and accurate data. There are a number of site-specific characteristics that determine a structure's ability to withstand hazards like first-floor elevation, the number of stories, construction type, foundation type, and the age and condition of the structure. The County maintains a property tax assessment database that includes some of this information, but this information was not completely accessible at the time that this report was prepared.

Each hazard is discussed in terms of its potential impact on the community, including the types of structures and infrastructure that may be damaged or cause further harm.

Section Two: Mitigation Goals and Objectives presents a series of goals and objectives to help guide the County in building its disaster resistance and the alternative mitigation measures considered to address its hazard vulnerabilities. These goals and objectives address the vulnerabilities discussed in Section One.

Section Three: Alternative Mitigation Actions reflects the identified potential hazards and areas and facilities in the County with the potential to be damaged by hazards. This section highlights those areas vulnerable to hazards and evaluates mitigation actions to address them.

Section Four: Mitigation Plan and Implementation Strategy contains prioritized actions accompanied by details about the responsible organizations, estimated costs, possible funding sources and the timeline for implementation. This section concludes with a discussion of Monitoring, Evaluation and Updating which recommends establishing a permanent hazard mitigation team to effectively lead the implementation of the plan and continuation of the hazard mitigation planning process beyond this Plan.

In public meetings held in 2003, citizens and local government representatives discussed the findings of the vulnerability assessment and their implications for mitigation strategies. They expressed the chief desire that mitigation objectives should maintain the rich historic, recreational, and agricultural fabric of the community. Furthermore, objectives should recognize the necessity of commercial interests. First and foremost, however, mitigation objectives should protect people, property, local governments, and the local economy from the effects of hazards.

With regards to the hazard identification approach indicated by §201.6(c)(2)(i) of the DMA 2000 Plan Review Criteria, the table following is a description of the hazards that were identified, how they were identified, and why they were identified. Hazard identification involved a combination of input from concerned residents and preliminary research from Commonwealth of Pennsylvania resources, like PEMA and the Pennsylvania Department of Conservation of Natural Resources (DCNR).

After identifying possible hazards, data available online from the United States National

Climatic Data Center (NCDC), United States Geological Survey (USGS), PEMA, and other sources were used to further investigate the possible occurrence of a range of hazards. The data sets used to generate the assessment were sometimes out-of-date, therefore, hazard probabilities and severity in this document were at times discussed in broad terms in light of available information. These data limitations are discussed in the appropriate sections.

Table iv. Summary of Hazard Identification

Hazard	Why Identified	Source of Information	Disposition
Floods	Past disaster events in the County	FIRMs and digital Q3 data, past disaster declarations	Profile and vulnerability assessment
Severe weather (i.e., tornadoes, winter storms)	Frequent occurrences in the County	Input of HMPC, past disaster declarations, NCDC data	Profile and vulnerability assessment
Landslides/ subsidence	Past occurrences in the County	Input of HMPC, USGS data	Profile and vulnerability assessment
Wildfires	Past occurrences in the state	Input of HMPC, DCNR data	Described and considered low risk, therefore not profiled
Earthquake	Past occurrences in the state	Input of HMPC, USGS data	Described and considered low risk, therefore not profiled
Avalanche	Not applicable in this region; not considered further		
Coastal storms	Not applicable in this region; not considered further		
Tsunamis	Not applicable in this region; not considered further		
Volcanoes	Not applicable in this region; not considered further		

Those natural hazards that are likely to affect Clearfield County considerably are profiled and corresponding vulnerabilities assessed in the following section. These hazards are as follows:

- Flooding;
- Tornadoes and Wind Storms;
- Other Severe Weather; and
- Land Failure.

Other hazards that have little potential to occur are described but were not profiled, and the vulnerability to these hazards was not assessed.

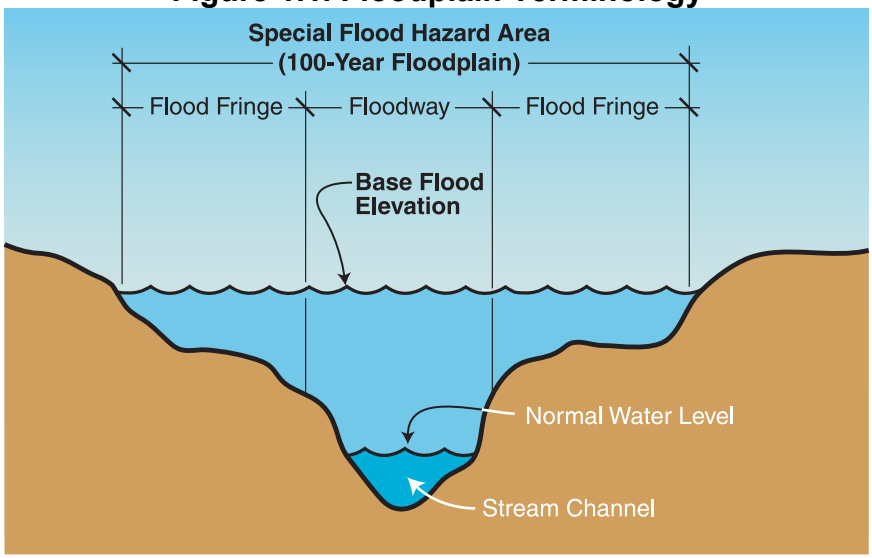
1.0 Hazard Vulnerability Assessment

1.1 Floods

1.1.1 Overview – Floods

A flood is a natural event for rivers and streams. For inland areas like Central Pennsylvania, excess water from snowmelt or rainfall accumulates and overflows onto the stream banks and adjacent floodplains. As illustrated in Figure 1.1, floodplains are lowlands, adjacent to rivers, streams and creeks that are subject to recurring floods.

Figure 1.1. Floodplain Terminology



Floods are considered hazards when people and property are affected. Nationwide, hundreds of floods occur each year, making it one of the most common hazards in all 50 states and U.S. territories. In Pennsylvania, flooding occurs commonly and can occur during any season of the year from a variety of sources. Every two to three years, serious flooding occurs along one or more of Pennsylvania's major rivers or streams, and it is not unusual for this to occur several years in succession. Most injuries and deaths from flooding happen when people are swept away by flood currents and most property damage results from inundation by sediment-filled water.

Several factors determine the severity of floods, including rainfall intensity and duration, topography and ground cover. A large amount of rainfall over a short time span can result in flash flood conditions. A small amount of rain can also result in floods in locations where the soil is frozen or saturated from a previous wet period or if the rain is concentrated in an area of impermeable surfaces such as large parking lots, paved roadways, or other impervious developed areas.

1.1.2 Previous Occurrences – Floods

Clearfield County has a long history of flooding problems. Most of the County is part of the Susquehanna River basin. The West Branch of the Susquehanna River flows through the County from southwest to northeast, along with its tributaries:

- Moshannon Creek,
- Clearfield Creek,
- Chest Creek,
- Anderson Creek, and
- Mosquito Creek.

Sandy Lick Creek in the northwest corner of the County is part of the Ohio River basin.

Clearfield County has suffered damage from numerous major floods and localized flash flooding. Table 1.1 lists some of the significant flood events in Clearfield County over more than 40 years.

Table 1.1. History of Flooding in Clearfield County

Location[2]	Date	Type	Death	Injury	Property Damage[3] ($K)
Several counties	March 1964	Flood[4]	N/A[5]	N/A	N/A
Countywide	June 1972	Flood (Hurricane)[6]	N/A	N/A	N/A
Countywide	July 1977	Flash Flood[5]	N/A	N/A	N/A
Countywide	July 1977	Flood[7]	N/A	N/A	N/A
Countywide	4/16/1993	Flood/Flash Flood	0	0	1
Countywide	4/16/1993	Flood/Flash Flood	0	0	1
Bigler	8/17/1993	Flash Flood	0	0	5
Countywide	6/24/1994	Flash Flood	0	0	50
Countywide	7/7/1994	Flash Flood	0	0	5
Several counties	1/19/1996	Flood[5]	0	0	N/A

[2] "Countywide" means several locations in the County; "several counties" means Clearfield and other neighboring counties.
[3] Property damage estimates in this and subsequent tables are based on best available data, but likely underestimate total damage in the County, as they do not include infrastructure damage.
[4] Governor's Proclamation of Disaster Emergency
[5] (Data) not available
[6] Governor's Proclamation and President's Declaration of Major Disaster
[7] Physical disaster loans & economic injury disaster loan made available by SBA

Location[2]	Date	Type	Death	Injury	Property Damage[3] ($K)
Countywide	7/19/1996	Flash Flood[5]	0	0	N/A
Du Bois	8/2/2000	Flash Flood	0	0	10
					72

Sources: National Climatic Data Center (NCDC) website, PEMA website

1.1.3 Hazard Profile – Floods

Hazard Characteristics

In Central Pennsylvania, including Clearfield County, there are seasonal differences in the causes for floods. In the winter and early spring (February to April), major flooding has occurred as a result of heavy rainfall on dense snowpack throughout contributing watersheds, although the snowpack is generally moderate during most winters. Winter floods also have resulted from runoff of intense rainfall on frozen ground, and local flooding has been exacerbated by ice jams in rivers, streams and creeks.

Summer floods have occurred from intense rainfall on previously saturated soils. Summer thunderstorms that deposited large quantities of rainfall over a short period of time have also produced flash flooding. In addition, as detailed under *Hurricanes* in the *Severe Weather* hazard discussion in this section of the plan, the Commonwealth occasionally receives intense rainfall from tropical storms in late summer and early fall.

The most severe flooding in Central Pennsylvania has been associated with the Susquehanna River Basin, which is the largest on the Atlantic Seaboard of the United States and drains directly into the Chesapeake Bay. In addition, a main tributary of the Susquehanna River located within Clearfield County – the West Branch of the Susquehanna – is a major source of flooding within Clearfield County. Figure 1.2 (included in this section and at the back of this report) indicates the location of these water courses.

Probability of Occurrence

Floods are described in terms of their extent (including the horizontal area affected and the vertical depth of floodwaters) and the related probability of occurrence. Flood studies use historical records to determine the probability of occurrence for different extents of flooding. The probability of occurrence is expressed in percentages as the chance of a flood of a specific extent occurring in any given year.

A specific flood that is used for a number of purposes is called the "base flood", which

has a one percent chance of occurring in any particular year. The base flood is often referred to as the "100-year flood" since its probability of occurrence suggests it should reoccur once every 100 years, although this is not the case in practice. Experiencing a 100-year flood does not mean a similar flood cannot happen for the next 99 years; rather it reflects the probability that over a long period of time, a flood of that magnitude has a one percent chance of occurring in any give year.

Smaller floods occur more often than larger (deeper and more widespread) floods. Thus, a "10-year" flood has a greater likelihood of occurring than a "100-year" flood. Table 1.2 shows a range of flood recurrence intervals and their probabilities of occurrence.

The extent of flooding associated with a one percent probability of occurrence – the base flood – is used as a regulatory boundary by a number of federal, state and local agencies. Also referred to as the "special flood hazard area" (see Figure 1.1), this boundary is a convenient tool for assessing vulnerability and risk in flood-prone communities, since many communities like Clearfield County have maps available that show the extent of the base flood and the likely depths that will be experienced. Figure 1.2 depicts the base flood area (100-year floodplain) as well as the 500-year floodplain in Clearfield County.

Table 1.2. Flood Probability Terms

Flood Recurrence Intervals	Chance of Occurrence in Any Given Year, %
10 year	10
50 year	2
100 year	1
500 year	0.2

Source: FEMA 386-2, *Understanding Your Risks*

Severity

Several factors determine the extent or "severity" of floods, including rainfall intensity and duration or volume and rate of snowmelt. The County also has conditions that may exacerbate the effects of floods:

- Topography and ground cover contribute to the location and severity of floods, e.g., water runoff is greater in areas with steep slopes and little or no vegetative ground cover.
    - Steep slopes: the County has sloping terrain that can contribute to increased flooding, since runoff reaches the receiving creeks, streams and rivers more rapidly over steeper terrain.
    - Paved surfaces: urbanization leads to replacement of vegetative ground cover with

asphalt and concrete, increasing surface runoff of stormwater. This effect may be exacerbated by poorly planned stormwater drainage systems.

- Hazardous materials storage: several facilities that store hazardous materials are located in the 100-year and 500-year floodplains, presenting potential sources of contamination during flood events.

1.1.4 Hazard Vulnerability – Floods

Existing Community Assets

The flood hazard vulnerability assessment for the County focused on the community assets that are located in the 100-year floodplain. While greater and smaller floods are possible, information about the extent and depth for the 100-year floodplain is available in a similar format for all Clearfield County municipalities, providing a consistent basis for analysis.

The following process was used to assess flood vulnerability in the 100-year floodplain:

- All the structures in the floodplain were identified using County GIS data, digital Q3 data, and flood insurance rate maps (FIRMs).

- Structures which were not "addressable" (any structure that is not an outbuilding, i.e., a garage, outhouse, storage shed, or barn) were ruled out.

- The first-floor elevation of all these structures was assumed to be the ground-surface elevation at the centroid of the parcel. Ground surface elevations (with two-foot contours) were interpolated using digital topographic information from the Pennsylvania Spatial Data Access (PASDA) website and centroid locations from the GIS files.

- The difference of 100-year flood level and the estimated first-floor (ground-surface) elevation was calculated as the depth of flooding. This may overestimate the potential damage to building, which is a function of the depth of flooding.

The flood vulnerability analysis revealed that 3,269 structures, about 4.5 percent of all structures identified in Clearfield County, lie within the 100-year floodplain. Table 1.3 shows the distribution of these structures by municipality.

Of these structures, detailed flood-study data exists for the area where 1,822 structures are located. They are in the AE zone according to the FEMA flood maps, which means they have Base Flood Elevations (BFE's). Detailed flood studies are typically done by FEMA for those areas that have a flood hazard and are developed enough to make it cost-effective to do a detailed study. For the structures in the AE zone, more detailed

assessments of vulnerability were performed.

For this analysis, estimates of potential damage were approximated by the estimated depth of interior flooding expected from the base flood. The resulting values were then sorted in descending order to provide an estimate of their relative vulnerability. Table 1.4 identifies the number of structures within each of these vulnerability categories by municipality.

Table 1.3. Structures in Floodplain by Municipality

Municipality	Total No. of Structures in Municipality	No. of Structures in 100-year Floodplain	Percent of Structures in 100-year Floodplain	No. of Structures in 500-year Floodplain
Lawrence	5,935	588	9.9%	1
DuBois	5,337	583	10.9%	171
Sandy	8,394	287	3.4%	1
Huston	1,599	205	12.8%	0
Decatur	3,275	170	5.2%	0
Bradford	3,069	127	4.1%	0
Burnside	1,710	127	7.4%	0
Morris	2,928	100	3.4%	0
Curwensville	1,988	81	4.1%	0
Coalport	349	69	19.8%	0
Bell	1,540	62	4.0%	0
Woodward	1,837	58	3.2%	0
Girard	1,020	55	5.4%	0
Clearfield	4,223	53	1.3%	147
Brady	2,136	51	2.4%	0
Graham	1,499	50	3.3%	0
Beccaria	1,656	46	2.8%	0
Karthaus	839	42	5.0%	0
Westover	403	42	10.4%	0
Cooper	3,045	39	1.3%	0
Penn	1,267	39	3.1%	0
Greenwood	590	38	6.4%	0
Pike	1,918	38	2.0%	0
Bigler	1,266	34	2.7%	0
Mahaffey	318	32	10.1%	0
Osceola Mills	902	29	3.2%	0
Grampian	293	26	8.9%	0
Glen Hope	146	25	17.1%	0
Goshen	611	25	4.1%	0

Municipality	Total No. of Structures in Municipality	No. of Structures in 100-year Floodplain	Percent of Structures in 100-year Floodplain	No. of Structures in 500-year Floodplain
Chester Hill	691	18	2.6%	0
Knox	705	18	2.6%	0
Union	1,024	18	1.8%	0
Gulich	1,239	15	1.2%	0
Ferguson	513	14	2.7%	0
Irvona	459	14	3.1%	0
Jordan	548	13	2.4%	0
Houtzdale	733	8	1.1%	0
Newburg	124	7	5.6%	0
Boggs	1,868	6	0.3%	0
Brisbin	395	6	1.5%	0
Chest	647	5	0.8%	0
Bloom	620	4	0.6%	0
Covington	987	2	0.2%	0
Falls Creek	34	0	0.0%	0
Lumber City	81	0	0.0%	0
New Washington	104	0	0.0%	0
Pine	186	0	0.0%	0
Ramey	438	0	0.0%	0
Troutville	191	0	0.0%	0
Wallaceton	339	0	0.0%	0
Total	**72,019**	**3,269**	**4.5%**	**320**

Table 1.4. Relative Vulnerability of Structures with BFE by Municipality

Municipality	Extreme	High	Low	Unknown	Total
Lawrence	262	14	90	222	588
DuBois	222	90	270	1	583
Decatur	52	25	85	8	170
Coalport	44	10	15	0	69
Clearfield	42	10	1	0	53
Sandy	16	5	75	191	287
Beccaria	12	10	12	12	46
Penn	10	0	10	19	39
Mahaffey	9	0	23	0	32
Bell	4	0	22	36	62
Huston	3	13	107	82	205

Municipality	Extreme	High	Low	Unknown	Total
Chester Hill	3	10	5	0	18
Bigler	2	1	16	15	34
Morris	2	0	20	78	100
Osceola Mills	1	0	28	0	29
Burnside	0	2	33	92	127
Curwensville	0	0	56	25	81
Westover	0	0	27	15	42
Grampian	0	0	21	5	26
Pike	0	0	15	23	38
Irvona	0	0	10	4	14
Gulich	0	0	7	8	15
Bradford	0	0	0	127	127
Woodward	0	0	0	58	58
Girard	0	0	0	55	55
Brady	0	0	0	51	51
Graham	0	0	0	50	50
Karthaus	0	0	0	42	42
Cooper	0	0	0	39	39
Greenwood	0	0	0	38	38
Glen Hope	0	0	0	25	25
Goshen	0	0	0	25	25
Knox	0	0	0	18	18
Union	0	0	0	18	18
Ferguson	0	0	0	14	14
Jordan	0	0	0	13	13
Houtzdale	0	0	0	8	8
Newburg	0	0	0	7	7
Boggs	0	0	0	6	6
Brisbin	0	0	0	6	6
Chest	0	0	0	5	5
Bloom	0	0	0	4	4
Covington	0	0	0	2	2
Falls Creek	0	0	0	0	0
Lumber City	0	0	0	0	0
New Washington	0	0	0	0	0
Pine	0	0	0	0	0
Ramey	0	0	0	0	0
Troutville	0	0	0	0	0
Wallaceton	0	0	0	0	0
Total	**684**	**190**	**948**	**1447**	**3269**

Vulnerability in Table 1.4 is defined as follows:

- Extreme: depth of flooding greater than 4 feet;
- High: 1 to 4 feet of flooding;
- Low: less than 1 foot of flooding; and
- Unknown: indeterminate (no BFE available).

Note that no BFE is available for more than 1,400 structures in the 100-year floodplain (almost half of the structures in the floodplain), so the relative vulnerability for some municipalities may actually be much higher than is shown. 21 of the 44 municipalities with structures in the 100-year floodplain have no BFE available for any of those structures.

Repetitive-loss (RL) properties under the National Flood Insurance Program (NFIP) guidelines include any building with two or more flood losses (occurring more than ten days apart) greater than $1,000 in any 10-year period since 1978. FEMA maintains a national list of such properties, and Table 1.5 indicates the 24 RL properties in Clearfield County. FEMA has specifically targeted certain RL properties (i.e., those with the greatest number of claims); 164 of those target properties are in Pennsylvania (and one of them is in the County).

Table 1.5. Repetitive Flood-Loss Properties

Municipality	No.
Dubois City	8
Coalport Borough	7
Westover Borough	3
Curwensville Borough	2
Mahaffey Borough	2
Clearfield Borough	1
Irvona Borough	1

Source: FEMA

Includes 1 of 164 target flood properties in Pa

Appendix B presents the detailed calculations of flood losses. The total flood losses (as described below) for the County from a 100-year flood are **more than $160 million**.

- Structural Loss. In assessing physical vulnerability, the most important factor is the extent to which structures get damaged when they are exposed to water, high velocity, and debris impact. As compared to some of the other hazards considered in this plan, the effect of floods on building performance is fairly well understood and documented. The flood loss calculation tables in Appendix B depict the extent of

damage from various flood depths on different kinds of structures. These tables are derived from the FEMA "Benefit-Cost Analysis Module" which was based on flood damage across the country. Using the tables, the estimated flood depth, and the type of structure (from the structure codes in the GIS database and the assumptions noted in Appendix B), the percent damage expected to each building was determined. For example, a two-story residential building without a basement that had six to seven feet of flooding is estimated to result in 26 percent structural damage. However, a manufactured home with six to seven feet of flooding would result in 82 percent structural damage.

- Contents Loss. The flood loss estimation tables in Appendix B provide a simplified indication of the percent damage to building contents for various depths of flooding. Using the estimated flood depth, the tables provide the percent contents damage. For example, a two-story residential building without a basement that had six seven feet of flooding is estimated to result in 39 percent contents damage, whereas a manufactured home with six to seven feet of flooding would result in 90 percent contents damage. Since the contents damage chart has been established over many flood events, the values are for generic contents.

- Functional Downtime. Using the depth of flooding determined previously and the type of building, we can determine the functional downtime for a flood from the loss estimation tables in Appendix B. For example, a business in a two-story building without a basement that had six to seven feet of flooding would be closed for approximately 26 days before business could resume in another location.

- Displacement Time. Using the depth of flooding and the type of building, we can determine the displacement time from a flood from the loss estimation tables in Appendix B. For example, a business located in a two-story building without a basement that had six to seven feet of flooding would be displaced from its regular building for approximately 158 days.

Critical facilities

Appendix A contains a listing of Critical Facilities that have been identified in Clearfield County including hospitals, police/fire stations, county/municipal buildings, and hazardous material facilities. There are 25 critical facilities in Clearfield County that are located in the 100-year floodplain.

Future Development Trends

New structures in flood-prone areas would be developed per current floodplain-management ordinances.

1.1.5 Conclusions – Floods

The following summarizes the salient points identified during the hazard identification, profiling and vulnerability assessment portions of the work that are carried forward as part of the planning process.

Summary of Hazard Vulnerability Assessment

Floods have been and will continue to be a significant threat to the economic and social well-being of selected areas of the County. The main sources of flooding in the County, the West Branch of the Susquehanna River and its tributaries, have produced significant flooding several times in the past with great consequences for the County. The County has had six declared disasters since 1964, including two significant events in 1996. Flood control projects on the Susquehanna River since the major floods of the 1970's, however, may have reduced the risks from floods.

Exacerbating the effects of flooding in the County are steep slopes and hazardous materials facilities in the floodplain. With 1,822 addressable structures in the floodplain areas with known BFE information (including hazardous material facilities) and an estimated $160 million in losses from the 100-year flood, flooding is the most significant hazard facing Clearfield County. The municipalities at the greatest risk from flooding (in order of decreasing relative vulnerability) are:

- Lawrence,
- DuBois,
- Decatur,
- Coalport,
- Clearfield,
- Sandy, and
- Beccaria.

What can be Mitigated?

Determining the aspects of Clearfield County flood vulnerability that can be mitigated requires a review of the causal factors for floods. In Clearfield County, flooding is primarily caused by human infringement upon natural processes – simply stated, development has been pursued in naturally occurring floodplains. As a result, available alternatives for mitigation actions (discussed in Section Two – *Mitigation Actions*) focus on property protection measures as opposed to altering water courses or changing land management practices within the contributing watersheds. Future development in floodplains will be limited through appropriate legislative and administrative actions and procedures.

Data Limitations

The flood vulnerability analysis depended upon limited data sources including:

- FIRMs: The date of the 218 FIRMs for the County varied from 1974 to 1990 (see Appendix G), with 111 of them dated prior to 1980. For example, the FIRMs for Clearfield and DuBois are from 1978 and 1979, respectively. Flood studies that are 25 to 30 years old may severely underestimate the extent of flooding during design events.

- First-Floor Elevations: The lowest-floor elevation (usually referred to as the first-floor elevation) of structures in a floodplain is an essential element to determining the appropriate flood mitigation measures. However, because first-floor elevation data was not available, the first-floor elevation of structures within Clearfield County was estimated using GIS analysis to determine the ground elevation at the center of the structure (using 2-foot contour intervals from PASDA). Further study is needed to determine the exact first-floor elevations of these structures. Because of the uncertainty associated with these elevations, some structures estimated to have first-floor elevations below the BFE may later be determined to be above BFE and thus of lower vulnerability (and vice versa). This elevation information is necessary to better ascertain the appropriate mitigation measures and to calculate the benefits and costs of this mitigation action.

- BFE and Data Other than 100-Year Flood: The BFE used in this plan to determine the exposure to flooding is an acceptable standard for such planning purposes. The GIS analysis used to determine which structures fall within the 100-year floodplains does not account for floods of higher probabilities, for example 10-year, 25-year, and 50-year floods. Consequently, structures that would be affected by such smaller floods are not highlighted; however, these structures are included in the 100-year flood analysis. In addition, the effects of floods of both greater and smaller probabilities will eventually need to be accounted for to obtain funding from federal and state agencies for mitigation projects. The GIS analysis performed is also limited to the structures in the AE zone, i.e., which have BFE information. There are many structures in the 100-year floodplain that are currently in the A zone (no BFE information); vulnerability analysis can be performed for them when detailed studies are done to determine BFE's.

- Structure Data: Some of the information such as the number of stories, presence of a basement, and construction type that is necessary to determine damage and replacement values (the cost to rebuild) of structures was not available from the Clearfield County tax assessment database at the time this plan was developed. Replacement value is a necessary component in estimating the dollar amount of losses in a flood and, when coupled with a range of flood probabilities from the 10-year to 500-year flood depths, can help in describing the benefits and costs of

mitigation actions in monetary terms.

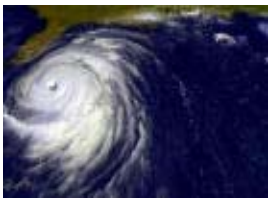
1.2 Severe Weather

Like other MidAtlantic communities, Clearfield County experiences many significant severe weather events every year. Depending upon the time of year, amount of atmospheric moisture, wind conditions, and global or regional phenomena like "El Nino", local weather conditions can turn from routine to hazardous. Severe weather conditions such as high winds or extremes in snow depths or lack of precipitation can endanger lives, as well as affect the ability of businesses or the local government to function. In this portion of Section One, four different types of severe weather are discussed:

- Hurricanes,
- Tornadoes and Wind Storms,
- Winter Storms, and
- Drought.

1.2.1 Severe Weather – Hurricanes

1.2.1.1 Overview – Hurricanes



A hurricane is a type of tropical cyclone, which is a generic term for a cyclonic, low-pressure system that features strong winds and precipitation. Tropical cyclones develop over tropical or sub-tropical waters. Cyclones with maximum sustained winds of less than 39 miles per hour (mph) are called tropical depressions. A tropical storm is a cyclone with maximum sustained winds greater than 39 mph but less than 74 mph, and hurricanes are intense tropical weather systems with maximum sustained winds of 74 mph or higher.

1.2.1.2 Previous Occurrences – Hurricanes

Like most states along the eastern seaboard, the Commonwealth of Pennsylvania has had its share of tropical-storm and hurricane-related events, usually in the form of heavy rainfall and winds. Although the Commonwealth does not have coasts along the Atlantic Ocean, tropical storms and hurricanes have traversed the state and affected Clearfield County. Previous occurrences, including Hurricane Agnes in 1972, Hurricane Eloise in 1975, Tropical Storm Beryl in 1994 and Hurricanes Dennis and Floyd in 1999, have brought intense rainfall, sometimes leading to damaging floods (see the preceding portion of this section regarding *Floods* for more information). These storms also brought strong northeast winds, which, combined with waterlogged soils, caused trees and utility poles to fall.

1.2.1.3 Hazard Profile - Hurricanes

Hazard Characteristics

Hurricanes form over warm waters and are caused by the atmospheric instability created by the collision of warm air with cooler air. These tropical cyclones are characterized by thunderstorms and surface wind circulations which blow in a large spiral around a calm center called the eye, which can be 20 to 30 miles across. Strong cyclones that reach tropical storm or hurricane strength can bring torrential rains, high winds, inland flooding, and sometimes tornadoes.

Probability of Occurrence

Although hurricanes can cause flood events consistent with 100- and 500-year levels, their probability of occurrence is measured relative to wind speed. Table 1.6 shows the probability of winds that reach the strength of tropical storms and hurricane conditions in Clearfield and surrounding counties (based on a statistical sample region of more than 30,000 square miles for the past 46 years).

Table 1.6. Hurricane Wind Probability for Clearfield County Area

Wind Speed (mph)	Corresponding Saffir-Simpson Hurricane Categories	Annual Probability of Occurrence (%)
45-77	Tropical Storms and Category 1 Hurricanes	91.59
78-118	Hurricane Categories 1 to 2	8.32
119-138	Hurricane Categories 3 to 4	0.0766
139-163	Hurricane Categories 4 to 5	0.0086
164-194	Hurricane Category 5	0.00054
195-210+	Hurricane Category 5	0.00001

Source: Tornado & Hurricane Shelter Model of "Benefit Cost Analysis of Hazard Mitigation Projects", developed by FEMA

The table includes wind speeds for all types of storms, not only storms that are cyclones. The table shows that in Clearfield County and surrounding areas, the annual probability for strong winds that equal the strength of tropical storms (over 39 mph) is over 90 percent, and the probability for winds at hurricane strength is more than 8 percent in any given year. However, winds of 119 mph or above have less than 1 percent chance of occurring.

Severity

As indicated in Table 1.6, the wind speeds with the greatest probabilities of occurrence,

45 to 77 mph and 78 to 118 mph, correspond to tropical storms and hurricane categories one and two. The expected damages of storms of this magnitude can be determined by using the Saffir-Simpson scale as shown in Table 1.7.

Table 1.7. Saffir-Simpson Scale for Wind Speeds

Category	Wind Speed, mph	Expected Damage
1	74-95	**Minimal:** Damage is done primarily to shrubbery and trees, unanchored mobile homes are damaged, some signs are damaged, no real damage is done to structures.
2	96-110	**Moderate**: Some trees are toppled, some roof coverings are damaged, and major damage is done to mobile homes.
3	111-130	**Extensive**: Large trees are toppled, some structural damage is done to roofs, mobile homes are destroyed, and structural damage is done to small homes and utility buildings.
4	131-155	**Extreme:** Extensive damage is done to roofs, windows, and doors; roof systems on small buildings completely fail; some curtain walls fail.
5	>155	**Catastrophic:** Roof damage is considerable and widespread, window and door damage is severe, there are extensive glass failures, and entire buildings could fail.

Source: NCDC website (www.nhc.noaa.gov/aboutsshs.shtml)

The expected damages from the wind speeds most likely to be encountered in Clearfield County are considered under this scale to be "minimal" to "moderate". However, these events can still topple trees and cause severe damage to manufactured homes.

1.2.1.4 Hazard Vulnerability - Hurricanes

Because flooding issues that may result from hurricanes and tropical storms have been included in the previous section and due to the similarity of the issues regarding hurricanes and tornadoes (i.e., the incidence of high winds), discussion of vulnerability to hurricanes is handled jointly at the end of the following discussion of Tornadoes and Wind Storms.

1.2.2 Severe Weather – Tornadoes and Wind Storms

1.2.2.1 Overview – Tornadoes and Wind Storms

A tornado, a violently rotating funnel-like vortex, is an extraordinary feature of severe thunderstorms. A condensation funnel does not need to reach to the ground for a tornado to be present; a debris cloud beneath a thunderstorm is all that is needed to confirm the presence of a tornado, even in the total absence of a funnel. While the extent of tornado damage is usually localized, the extreme winds of this vortex can be among the most destructive on earth when they move through populated, developed areas.

Straight-line winds are the movement of air from areas of higher pressure to areas of lower pressure – the greater the difference in pressure, the stronger the winds. Wind storms are generally defined as sustained wind speeds of 40 mph or greater lasting for one hour or longer, or winds of 58 mph or greater for any duration.

The Fujita Tornado Scale (or the "F-Scale") classifies US tornadoes into six intensity categories, named F0 to F5, based upon the estimated maximum winds occurring within the funnel. The F-Scale has subsequently become the definitive metric for estimating wind speeds within tornadoes based upon the damage done to buildings and structures.

1.2.2.2 Previous Occurrences – Tornadoes and Wind Storms

Tornadoes have occurred in Pennsylvania in all seasons and in all parts of the state, but the western and southeastern portions have been more frequently struck. However, one of the deadliest in recent memory was the May 1985 storm in which 6 people were killed and 60 were injured as campers, trailers, homes, and businesses were destroyed across Lycoming, Union, and Northumberland Counties. Tables 1.8 and 1.9 identify reported tornadoes and high winds, respectively, in Clearfield County over half a century.

Table 1.8. History of Tornadoes in Clearfield County

Location	Date	F-Scale	Death	Injury	Property Damage, $K
Countywide	4/27/1954	F1	0	0	N/A
Countywide	7/11/1976	F0	0	0	N/A
Several counties	5/31/1985	F4[8]	0	0	25,000
Madera	7/20/1994	F0	0	0	5
Lawrence	9/26/1994	F2	0	0	50

[8] Governor's Proclamation and President's Declaration of Major Disaster

Location	Date	F-Scale	Death	Injury	Property Damage, $K
New Washington	7/19/1996	F1	0	0	N/A
Irvona	6/2/1998	F0	0	0	N/A
Luthersburg	8/16/2001	F1	0	0	5
					25,060

Source: NCDC website (www.ncdc.noaa.gov/cgi-win)

Table 1.9. History of High Winds in Clearfield County

Location	Date	Mag. (knots)	Death	Injury	Property Damage, $K
Countywide	9/2/1993	N/A	0	0	1
Several counties	4/15/1994	N/A	0	0	500
Dubois	6/6/1994	N/A	0	0	50
Dubois	6/13/1994	N/A	0	0	5
Countywide	7/6/1994	N/A	0	0	1
Dubois	7/7/1994	N/A	0	0	5
Several counties	11/6/1994	N/A	0	3	50
Several counties	11/27/1994	N/A	0	0	500
Osceola Mills	4/26/1996	N/A	0	0	1
Burnside	1/18/1999	N/A	0	0	10
Grampian	5/24/1999	N/A	0	0	10
Irvona	6/2/1999	N/A	0	0	10
Dubois	6/7/1999	N/A	0	0	10
Penfield	7/9/1999	N/A	0	0	20
Tyler	7/9/1999	N/A	0	0	30
Beccaria	7/9/1999	N/A	0	0	10
Dubois	7/31/1999	N/A	0	0	10
Dubois	8/13/1999	N/A	0	0	10
Several counties	9/29/1999	60	0	0	100
Morrisdale	9/29/1999	N/A	0	0	5
Troutville	10/13/1999	N/A	0	0	5
Dubois	3/25/2000	N/A	0	0	3
Dubois	6/2/2000	N/A	0	0	3
Woodland	6/2/2000	N/A	0	0	3
Countywide	6/2/2000	N/A	0	0	5

Location	Date	Mag. (knots)	Death	Injury	Property Damage, $K
Countywide	6/13/2000	N/A	0	0	2
Penfield	6/15/2000	N/A	0	0	4
Osceola Mills	6/21/2000	N/A	0	0	2
Dubois	8/2/2000	N/A	0	0	3
Several counties	12/12/2000	N/A	1	2	500
Several counties	2/10/2001	N/A	0	0	150
Several counties	2/1/2002	63	0	0	5
Several counties	3/9/2002	50	0	0	50
Luthersburg	5/31/2002	N/A	0	0	2
			1	5	2,075

Source: NCDC website (note: 1 knot = 1.1 mph)

1.2.2.3 Hazard Profile – Tornadoes and Wind Storms

Hazard Characteristics

Tornadoes can occur at any time during the day or night, but are most frequent during late afternoon into early evening, the warmest hours of the day. Tornado movement is characterized in two ways: direction and speed of the spinning winds, and forward movement of the tornado/storm track. Rotational wind speeds of the vortex can range from 100 mph to more than 250 mph. In addition, the speed of forward motion can be zero to 45 or 50 mph. Therefore, some estimates place the maximum velocity (combination of ground speed, wind speed and upper winds) of tornadoes at about 300 mph.

The forward motion of the tornado path can be a few hundred yards or several hundred miles in length. The width of tornadoes can vary greatly, but generally range in size from less than 100 feet to over a mile in width. Some tornadoes never touch the ground and are short-lived, while others may touch the ground several times.

Probability of Occurrence/Severity

According to the National Weather Service, the Commonwealth of Pennsylvania has an annual average of ten tornadoes with two related deaths. The probability of actually being in the path of a tornado in any given year in Clearfield County is quite small, on the order of 0.03 percent (see Table 1.10). Another way of visualizing this number is that you would have to stand on the same spot for about 3,000 years, to be reasonably certain of being in the direct path of a tornado.

Table 1.10. Tornado Fujita Scale, Associated Damage, and Probability of Occurrence for Clearfield County and Surrounding Areas

Tornado F-Scale	Wind Speed	Expected Damage	Annual Probability of Occurrence[9] (%)
F0	40-72 mph	Light damage: Some damage to chimneys; branches break from trees and show-rooted trees pushed over; damage to sign boards.	0.00033
F1	73-112 mph	Moderate damage: Peel surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off road.	0.00153
F2	113-157 mph	Considerable damage: Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light-object missiles generated.	0.00390
F3	158-206 mph	Severe damage: Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; cars lifted off ground and thrown.	0.00599
F4	207-260 mph	Devastating damage: Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.	0.02245
F5	261-318 mph	Incredible damage: Strong frame houses lifted off foundations and carried considerable distance to disintegrate; automobile-sized missiles fly through the air in excess of 100 yards; trees debarked; incredible phenomena will occur.	0.00000
		Overall Probability	0.03420

Source: Tornado and Hurricane Shelter Model of the "Benefit-Cost Analysis Software for Hurricane and Tornado Shelters" developed by FEMA, July 2000.

While the chance is small, the damage that results when the tornado arrives is devastating. A tornado with an "F4" designation can carry a wind velocity of 200 mph resulting in a force of more than 100 pounds per square foot of surface area, a "wind load" that exceeds the design limits of most buildings. An F4 tornado hit portions of Clearfield County in 1984.

A useful tool for determining vulnerability to the winds that result from hazard events like tornadoes (and tropical cyclones) is depicted in Figure 1.4. This map of design winds speeds was developed by the American Society of Civil Engineers and identifies wind speeds that could occur in different parts of the United States to be used as the basis for design and evaluation of the structural integrity of shelters and critical facilities.

[9] Probability of being in the path of the tornado.

Figure 1.4 shows that three different wind speed zones cover the Commonwealth of Pennsylvania: Zones II, III, and IV with design wind speeds for community shelters of 160, 200, and 250 miles per hour, respectively.

1.2.2.4 Hazard Vulnerability – Tornadoes And Wind Storms

Existing Community Assets

Since high wind events may affect the entire County, it is important to identify specific critical facilities and assets that are most vulnerable to the hazard. Evaluation criteria include age of the building (and what building codes may have been in effect at the time), type of construction, and condition of the structure (i.e., how well has the structure been maintained). *Individual structure data was not available for this study, so it was difficult to determine the exact number and types of structures within Clearfield County that have heightened vulnerability to wind hazards.* However, mobile homes and commercial trailers are extremely vulnerable to high winds, and Table 1.11 presents a list by municipality of those structures (in descending order). Therefore, for the purposes of this plan, the vulnerability of county assets to high winds and tornadoes are considered at the same time and are primarily based on the information contained in Figures 1.3 and 1.4 and Table 1.11.

Table 1.11. Residential and Commercial Trailers by Municipality

Municipality	No.
Lawrence Township	639
Sandy Township	348
Decatur Township	296
Bradford Township	270
Morris Township	265
Huston Township	261
Cooper Township	206
Boggs Township	199
Brady Township	199
Pike Township	168
Beccaria Township	160
Woodward Township	128
Girard Township	119
Penn Township	114
Bell Township	113
Graham Township	109
Clearfield Borough	108
Covington Township	94
Burnside Township	92

Municipality	No.
Knox Township	85
Gulich Township	81
Bigler Township	73
Curwensville Borough	73
Union Township	70
Jordan Township	66
Goshen Township	65
Chest Township	62
Karthaus Township	55
Ferguson Township	52
Greenwood Township	52
Chester Hill Borough	48
Westover Borough	43
Irvona Borough	37
Bloom Township	35
Brisbin Boro	33
Houtzdale Borough	33
Wallaceton Borough	29
Osceola Borough	28
Burnside Borough	24
Coalport Borough	24
Mahaffey Borough	22
Grampian Boro	21
Ramey Borough	15
Lumber City Borough	12
New Washington Borough	10
Troutville Borough	8
Newburg Borough	6
Glen Hope Borough	5
Pine Township	4
Dubois City	3
Total	5,062

Source: County parcel database

As noted in Table 1.9, Dubois has had an unusually high number of high-wind incidents over the past 10 years (far more than any other municipality in the County). This may be due to topography (i.e., being in a river valley) and other environmental characteristics. Therefore DuBois should also be listed as being vulnerable to high winds.

Based on the criteria noted above, the municipalities at the greatest risk from high winds and tornadoes (in order of decreasing relative vulnerability) are:

- Dubois,
- Lawrence,
- Sandy,
- Decatur,
- Bradford, and
- Morris.

Future Development

The *Capability Assessment* portion located at the end of this section identifies communities that do not as yet have an adopted building code. The lack of codes and/or inadequate inspection capabilities can hinder the ability of new construction to resist design wind load.

1.2.3 Severe Weather – Winter Storms

1.2.3.1 Overview – Winter Storms

Winter storms consist of cold temperatures and heavy snow or ice. Because winter storms are regular, annual occurrences in Pennsylvania, they are considered hazards only when they result in damage to specific structures and/or overwhelm local capabilities to handle disruptions to traffic, communications and electric power.

1.2.3.2 Previous Occurrences – Winter Storms

The Commonwealth of Pennsylvania has a long history of severe winter weather. In the winter of 1993-4, the state was hit by a series of protracted winter storms. The severity and nature of these storms combined with accompanying record-breaking frigid temperatures posed a major threat to the lives, safety and well-being of Commonwealth residents and caused major disruptions to the activities of schools, businesses, hospitals, and nursing homes.

The first of these devastating winter storms occurred in early January with record snowfall depths (in excess of 33 inches in the southwest and south-central portions of the Commonwealth), strong winds and sleet/freezing rains. Numerous storm-related power outages were reported, and as many as 600,000 residents were without electricity, in some cases for several days at a time. A ravaging ice storm followed, affecting the southeastern portion of the Commonwealth, which closed major arterial roads and downed trees and power lines. Utility crews from a five-state area were called to assist in power restoration repairs. Officials from PP&L stated that this was the worst winter

storm in the history of the company, and related damage-repair costs exceeded $5,000,000.

Serious power supply shortages continued through mid-January because of record cold temperatures at many places, causing sporadic power generation outages across the Commonwealth. The entire Pennsylvania-New Jersey-Maryland grid and its partners in the District of Columbia, New York and Virginia experienced 15-30 minute rolling blackouts, threatening the lives of people and the safety of the facilities in which they resided. Power and fuel shortages affecting Pennsylvania and the East Coast power grid system required the Governor to recommend power conservation measures be taken by all commercial, residential, and industrial power consumers.

The record cold conditions resulted in numerous water-main breaks and interruptions of service to thousands of municipal and city water customers throughout the Commonwealth. Additionally, the extreme cold in conjunction with accumulations of frozen precipitation resulted in acute shortages of road salt. As a result, trucks were dispatched to haul salt from New York to expedite deliveries to PA Department of Transportation (DOT) storage sites.

During January and February 1994, Pennsylvania experienced at least 17 regional or statewide winter storms. The consequences of these disasters resulted in the need for intervention by the President in an effort to alleviate the severity of the hardship and to aid the recovery of the hardest-hit counties.

In January 1996, another series of severe winter storms with 27- and 24-inch accumulated snow depths was followed by 50 to 60 degree temperatures resulting in rapid melting and flooding (as described in the preceding section on *Flood Hazard Vulnerability Assessment*).

Table 1.12. History of Winter Storms in Clearfield County

Location	Date	Type	Death	Injury	Property Damage, $K
Statewide	Jan 1966	Heavy Snow[10]	N/A	N/A	N/A
Statewide	Feb 1972	Heavy Snow[10]	N/A	N/A	N/A
Several counties	Jan 1977	Severe Winter Weather/Gas Shortage[11]	N/A	N/A	N/A
Statewide	Jan 1978	Heavy Snow[10]	N/A	N/A	N/A
Statewide	Feb 1978	Heavy Snow[10]	N/A	N/A	N/A

[10] Governor's Proclamation of Disaster Emergency
[11] Governor's Proclamation & President's Declaration Of Major Disaster

Location	Date	Type	Death	Injury	Property Damage, $K
Several counties	Winter 1981	Heavy Snow	N/A	N/A	N/A
Several counties	Winter 1983	Heavy Snow	N/A	N/A	N/A
Several counties	Winter 1988	Heavy Snow	N/A	N/A	N/A
Statewide	March 1993	Heavy Snow[11]	N/A	N/A	N/A
Several counties	1/4/1994	Heavy Snow[11]	0	185	5,000
Several counties	1/14/1994	Extreme Cold	3	129	5,000
Several counties	1/17/1994	Heavy Snow[11]	0	0	500
Several counties	1/27/1994	Ice	0	62	50
Several counties	3/2/1994	Blizzard	0	1	5,000
Several counties	3/10/1994	Ice	0	0	500
Several counties	3/4/2001	Heavy Snow	0	0	150
Several counties	2/16/2003	Heavy Snow[10]	0	2	N/A
			3	379	16,200

Source: NCDC website, PEMA website

1.2.3.3 Hazard Profile – Winter Storms

Hazard Characteristics

Winter storms begin as low-pressure systems that move through Pennsylvania either following the jet stream or developing as extra-tropical cyclonic weather systems over the Atlantic Ocean called "Nor'esters." The effects of these storms can sometimes last for weeks, bringing several inches or even feet of snow and ice and cold temperatures.

Probability of Occurrence

Winter storms occur on the average of 35 times a year in Pennsylvania. The NCDC estimates that most of Clearfield County has a 5 percent annual chance of equaling or exceeding accumulated snow depths of 30 to 40 inches. NCDC indicates that eastern Clearfield County (at the higher elevations) has a 5 percent annual chance of equaling or exceeding accumulated snow depths of 40 to 50 inches.

Severity

A winter storm can adversely affect roadways, utilities, business activities and can cause loss of life, frostbite, or freezing. Winter storms may contain one or more of the following hazardous weather events:

- Heavy Snowstorm: Accumulations of four inches or more in a six-hour period, or six inches or more in a twelve-hour period.
- Sleet Storm: Significant accumulations of solid pellets which form from the freezing of raindrops or partially melted snowflakes causing slippery surfaces posing hazards to pedestrians and motorists.
- Ice Storm: Significant accumulations of rain or drizzle freezing on objects (trees, power lines, roadways, etc.) as it strikes them, causing slippery surfaces and damage from the sheer weight of ice accumulation.
- Blizzard: Wind velocity of 35 miles per hour or more, temperatures below freezing, considerable blowing snow with visibility frequently below one-quarter mile prevailing over an extended period of time.
- Severe Blizzard: Wind velocity of 45 miles per hour, temperatures of 10 degrees Fahrenheit or lower, a high density of blowing snow with visibility frequently measured in feet prevailing over an extended period time.

1.2.3.4 Hazard Vulnerability – Winter Storms

Existing Community Assets

In Clearfield County, wintertime snow accumulations are expected and normal. The most common, but potentially serious effect of very heavy snowstorms with accumulations exceeding six or more inches in a 12-hour period are traffic accidents; interruptions in power supply and communications; and the failure of inadequately designed and/or maintained roofing systems. Similar to the discussion under tornadoes, vulnerability to the effects of winter storms on buildings is dependent on the age of the building (and what building codes may have been in effect at the time), type of construction, and condition of the structure (i.e., how well has the structure been maintained). Individual structure data was not available for this study so it was difficult to determine the exact number and types of structures within Clearfield County that have heightened vulnerability to winter-storm snow loading.

Future Development

As with high winds, the *Capability Assessment* portion located at the end of this section identifies communities that do not as yet have an adopted building code, which limits the probability that new construction will be able to resist design snow loads.

1.2.4 Severe Weather – Drought

1.2.4.1 Previous Occurrences – Drought

A drought is a period of prolonged dryness that contributes to depletion of ground-water and surface-water yields. When droughts occur, they can have significant adverse consequences to:

- Public water supplies for human consumption:
- Rural water supplies for livestock consumption and agricultural operations;
- Water quality;
- Natural soil water or irrigation water for agriculture;
- Water for forests and for fighting forest fires; and
- Water for navigation and recreation.

1.2.4.2 Previous Occurrences – Drought

Between 1930 and 1994, the Commonwealth of Pennsylvania experienced five significant droughts: 1930-1934, 1939-1942, 1953-1955, 1961-1967 and 1991-1992. From 1999 through early 2003, the area experienced a severe drought (per the PA Department of Environmental Protection (DEP). Other drought data is shown in Table 1.13.

Table 1.13. History of Drought in Clearfield County

Location	Date	Crop Damage, $K
Statewide	Sept 1963[12]	N/A
Statewide	July 1991[13]	N/A
Statewide	July 1999[13]	500,000
Statewide	Jan 2002[12]	N/A
		500,000

Source: NCDC website, PEMA website

[12] Governor's Proclamation and President's Declaration of Major Disaster
[13] Governor's Proclamation of Disaster Emergency

1.2.4.3 Hazard Profile – Drought

Hazard Characteristics

Drought is a normal part of virtually all climates, the consequence of a natural reduction in the amount of precipitation experienced over a long period of time, usually a season or more in length. High temperatures, prolonged winds, and low relative humidity can exacerbate the severity of drought.

Probability of Occurrence

Central Pennsylvania has averaged 3.4 dry periods (ten or more consecutive days having less than 0.01 inch of precipitation) per year from 1950 through 1992.

Severity

The Commonwealth uses five parameters to assess drought conditions:

- Streamflows (compared to benchmark records);
- Precipitation (measured as the departure from normal, 30-year average precipitation);
- Reservoir storage levels in a variety of locations;
- Groundwater elevations in a number of counties (comparing to past month, past year and historic record); and
- The Palmer Drought Index, a measure of soil moisture computed by the National Weather Service.

Phases of drought preparedness in Pennsylvania are:

- Drought Watch: A period to alert government agencies, public water suppliers, water users and the public regarding the potential for future drought-related problems. The focus is on increased monitoring, awareness and preparation for response if conditions worsen. A request for voluntary water conservation is made. The objective of voluntary water conservation measures during a drought watch is to reduce water uses by 5 percent in the affected areas. Because of varying conditions, individual water suppliers or municipalities may be asking for more stringent conservation actions.

- Drought Warning: This phase involves a coordinated response to imminent drought conditions and potential water supply shortages through concerted voluntary conservation measures to avoid or reduce shortages, relieve stressed sources, develop new sources, and if possible forestall the need to impose mandatory water use restrictions. The objective of voluntary water conservation measures during a drought warning is to reduce overall water uses by 10-15 percent in the affected areas. Because of varying conditions, individual water suppliers or municipalities may be

asking for more stringent conservation actions.

- Drought Emergency: This stage is a phase of concerted management operations to marshal all available resources to respond to actual emergency conditions, to avoid depletion of water sources, to assure at least minimum water supplies to protect public health and safety, to support essential and high priority water uses and to avoid unnecessary economic dislocations. It is possible during this phase to impose mandatory restrictions on nonessential water uses that is provided for in 4 PA Code Chapter 119, if deemed necessary and if ordered by the Governor of Pennsylvania. The objective of water use restrictions (mandatory or voluntary) and other conservation measures during this phase is to reduce consumptive water use in the affected area by 15 percent, and to reduce total use to the extent necessary to preserve public water system supplies, to avoid or mitigate local or area shortages, and to assure equitable sharing of limited supplies.

- Local Water Rationing: Although not a drought phase, local municipalities may, with the approval of the PA Emergency Management Council, implement local water rationing to share a rapidly dwindling or severely depleted water supply in designated water supply service areas. These individual water rationing plans, authorized through provisions of 4 PA Code Chapter 120, will require specific limits on individual water consumption to achieve significant reductions in use. Under both mandatory restrictions imposed by the Commonwealth and local water rationing, procedures are provided for granting of variances to consider individual hardships and economic dislocations. [Source: PEMA, 409 Plan]

1.2.4.4 Hazard Vulnerability – Drought

Drought is a concern for Clearfield County residents because of the presence of farms and other water-dependent industry and recreation in the area. A prolonged drought could negatively impact these sectors of the local economy, as well as residents who depend on wells for drinking and other personal uses.

The DEP web site indicates that the community water systems in the County obtain water supplies from surface water and wells. The smaller systems typically use wells and have undersized storage facilities that are incapable of providing adequate operating, emergency, and fire reserves.

1.2.5 Conclusions – Severe Weather

The following summarizes the salient points identified during the hazard identification, profiling and vulnerability assessment portions of the work that are carried forward as part of the planning process.

1.2.5.1 Summary of Hazard Vulnerability Assessment

Clearfield County is vulnerable to tropical cyclones such as hurricanes, which can cause heavy rainfall and subsequent flooding. There were several major events in the 1970's that caused record flooding levels and damages. The hazard analysis shows that Clearfield County is also vulnerable to possible tornado activity. Clearfield County is vulnerable to thunderstorms which can cause high winds, heavy rainfall and subsequent flooding.

Pennsylvania and Clearfield County experience several winter storms every year that can create power loss, among other obvious adverse effects. The series of storms in early 1993, 1994 and 1996 were Presidential declared disasters. Heavy snowstorm, sleet storm, ice storm, blizzard and severe blizzard are the types of winter storms possible in Clearfield County. Due to the frequency of past events and a relatively high annual probability for high snow depths, winter storms are very likely to continue affecting normal activity in the County in the coming years.

A drought is a possible hazard to Clearfield County, since central Pennsylvania experienced an average of 3.4 dry periods annually from 1950 to 1992. The Commonwealth of Pennsylvania experienced five significant droughts from 1930 to 1994. A drought in Clearfield County can have significant effect on domestic water supply, agriculture and other water-dependent activities.

1.2.5.2 What Can Be Mitigated?

The nature of much of the severe weather hazards is that the entire County can be affected. There are no hazard zones, and every area within the County is equally exposed, although weather impacts may vary somewhat according to topography[14] and other factors. For all severe storm events – including tornadoes, and severe winter storms – aged, dilapidated, or buildings not adequately built or not built to applicable building codes are more susceptible to wind and weather hazards. Manufactured housing (mobile homes) are especially susceptible to wind events. Strong winds can rip roofs off houses, overturn manufactured homes, or cause total failure of poorly constructed structures. Gable-ended roofs are also especially vulnerable to strong winds. Aged or otherwise compromised structures are also susceptible to snow loads if their roofing systems are not built to applicable standards. For that reason, vulnerability and determining what can be mitigated are described in terms of *structures* or *infrastructure* that are most vulnerable to the hazard.

1.2.5.3 Data Limitations

The severe weather vulnerability analysis depended upon limited data. During the

[14] For example, eastern parts of the County tend to have greater snow accumulation due to higher altitude.

development of this plan, the ability to ascertain information from the property database, necessary to determine which structures were aged/dilapidated or which had basements was affected. Subsequent versions of this plan will need to incorporate and respond to this data.

1.3 Land Failure

1.3.1 Overview – Land Failure

There are several types of land-failure hazards. Two types of land failures have relevance in Clearfield County: rockfalls and land subsidence. A rockfall occurs when a smaller rock-mass breaks free and disintegrates into blocks that bounce and roll down steep slopes. Land subsidence is the downward movement of surface material involving little or no horizontal movement, resulting in sinkholes.

1.3.2 Previous Occurrences – Land Failure

The DCNR maintains a database of land failures (i.e., sinkholes) throughout the Commonwealth. There have been several land failures reported in Pennsylvania but none in Clearfield County; however, representatives of the Clearfield County Department of Emergency Management identified minor rockfalls that have occurred along highways in the County.

1.3.3 Hazard Profile – Land Failure

Hazard Characteristics

Rockfalls and other slope failures often occur in areas with moderate to steep slopes, conducive geology and high precipitation. With the appropriate geology and topography, most slope failures are associated with precipitation events - either periods of sustained above-average precipitation, specific rainstorms or snowmelt events. Other elements that determine slope stability are vegetative cover and slope aspect. Contributing causes of landslides include erosion, removal of vegetation cover and ground shaking from earthquakes. Human activities that can contribute to slope failure include altering the slope gradient, increasing the soil's water content and removing vegetative cover.

Figure 1.5 illustrates the relative landslide hazard susceptibility across the Commonwealth of Pennsylvania. The Pennsylvania Geological Survey (PGS) of the DCNR describes landslide susceptibility in Clearfield County, which is in the Pittsburgh Low Plateau section of the state, as "high to moderate".

Slope stability depends upon a combination and balance of its soil, degree of slope, vegetation and underlying geology. A review of the potential land-failure areas in Clearfield County was conducted for soil characteristics and steep slopes. Using available data from the Clearfield County Soil Survey, three soil groups (Ernest, Rayne, and Wharton) were identified as having characteristics making them vulnerable to land failure. Of particular concern are those areas where steep slopes (greater than 25 percent) coincide with these soil types.

Areas where these two factors coincide have been mapped throughout the county and generally occur along stream and river valleys. The proximity of these soils with respect to streams and rivers is of particular concern since these areas can frequently be water-saturated.

Figure 1.6 is a compilation of the available data showing areas where soil groups vulnerable to failure are present, and the overlapping areas with slopes greater than 25 percent. Of the three soil groups in the County vulnerable to failure, only the Rayne soil group exists in steeply sloped areas. Structures built within these areas have also been plotted in Figure 1.6. Some of the previous rockfall incidents occurred in such areas. However, other site-specific factors like water table, level of erosion, human activity, etc. can increase or decrease the hazard in the areas identified as vulnerable.

A slope greater than 7 percent (approximately around 15 degrees) needs special considerations for building roads according to common engineering practice, and a slope of 15 percent (approximately around 25 degrees) is generally unstable and highly sensitive to surface changes. Slopes greater than 15 percent exist in Clearfield County, and much of the County has steep slopes (a slope of 7 percent or greater).

Land subsidence, also known as “sinkholes”, occurs naturally due to the physical and chemical weathering of certain types of bedrock. A sinkhole can be defined as a subsidence feature that can form rapidly and which is characterized by a distinct break in the land surface and the downward movement of surface materials into the resulting hole or cavity. In Pennsylvania, research has shown that sinkholes are generally found in areas underlain by carbonate bedrock, found in large areas of central and eastern Pennsylvania (but not in Clearfield County). Although the actual subsidence process occurs over a long period of time, the final collapse can occur very rapidly.

Subsidence can also occur as a result of underground mining, excessive pumping of ground water, or subsurface erosion due to the failure of existing utility lines. A brief review of DEP’s subsurface mining records indicates that a substantial amount of the County has been undermined for coal; however, the depth of those mines can not be readily determined.

Probability of Occurrence

With past rockfall incidents and the presence of areas where limestone-rock types coincide with steep slopes, rockfalls are likely to reoccur in the absence of mitigation activities. No previous sinkholes have been identified from natural causes; however, chances of a sinkhole due to subsurface mining are indeterminate.

Severity

Land failure can have potentially devastating consequences, but in very localized areas. Structures or infrastructure built on susceptible land will likely collapse as their footings slide downhill. Structures below the land failure can be crushed. In Clearfield County, rockfalls have previously been located on major highways, and future rockfall incidents have the potential to fall on and damage vehicles or cause drivers to have accidents.

1.3.4 Hazard Vulnerability – Land Failure

Existing Community Assets

There areas have 3,127structures in areas prone to land failure. Table 1.14 presents a list by municipality of structures in those areas (in descending order).

Table 1.14. Structures in Areas Prone to Land Failure

Municipality	Structures
Sandy	761
Lawrence	337
Curwensville	190
Huston	174
Beccaria	127
Pike	125
Bradford	116
Penn	104
Karthaus	79
Clearfield	78
Goshen	70
Bell	66
Boggs	66
Irvona	62
Greenwood	61
Burnside Twp	56
Decatur	54
Knox	51
Bigler	49

Municipality	Structures
Cooper	46
Brady	43
Chest	38
Ferguson	33
Girard	32
Coalport	31
Chester Hill	29
Woodward	28
DuBois	25
Jordan	23
Westover	22
Union	20
Houtzdale	18
Morris	16
Bloom	14
Graham	12
Pine	12
Burnside Boro	11
Covington	10
Newburg	9
Grampian	7
Glen Hope	6
New Washington	6
Lumber City	5
Gulich	4
Mahaffey	1
Total	3,127

Critical facilities

As indicated in Appendix A, there are six critical facilities in Clearfield County that are located in the areas susceptible to land failure.

Future Development Trends

Appendix H contains the results of an analysis of future development potential. This analysis of vacant parcels in Clearfield County reveals that a significant number of new units can be developed in areas prone to land failures under current zoning and regulations. The nature of the landslide and subsidence hazard in Clearfield County indicates that development in these areas may result in additional future property losses.

1.3.5 Conclusions – Land Failure

The following summarizes the salient points identified during the hazard identification, profiling and vulnerability assessment portions of the work that are carried forward as part of the planning process.

Summary of Hazard Vulnerability Assessment

Clearfield County has a generally low susceptibility to landslides according to the map by the PGS. The County is vulnerable to rockfalls in the few areas where steep slopes coincide with soil types that have a poor or fair slope stability. In these areas rockfalls are considered to have a higher likelihood of occurring and affecting existing structures and transportation routes. Future development in these areas can exacerbate slope instability. Sinkholes are also possible due to natural processes and human activities like underground mining, excessive pumping of ground water and subsurface erosion. Thus rockfalls and land subsidence are possible in the County owing to rock types and human activities that lead to such events.

What can be Mitigated?

There are existing structures on rockfall-vulnerable areas (steep slopes areas on soils with poor or fair slope stability), areas where rockfall-vulnerable areas occur along transportation routes and land-subsidence vulnerable areas (due to subsurface mining) which are subject to varying degrees of risk depending on the site-specific geology, hydrology, vegetation and the way they are constructed. Areas identified in the vulnerability section can be protected after further investigation. Damage to future development can be mitigated by administrative and regulatory mechanisms.

Data Limitations

More accurate subsurface mining data in focused areas and site-specific geologic information would strengthen the ability of the County to mitigate the land failure hazard.

1.4 Other Hazards

1.4.1 Earthquakes

No earthquake epicenters have been measured in Clearfield County. However, neighboring Cambria County experienced an earthquake of magnitude 3 to 4 on the Richter scale prior to 1960 in its northeastern corner. No damage in Clearfield County has been reported from any such events. Most earthquakes in Pennsylvania have occurred east of Clearfield County.

One way to express an earthquake's severity is to compare its acceleration to the normal acceleration due to gravity. Peak ground acceleration (PGA) measures the strength of ground movements in this manner. PGA represents the rate in change of motion of the earth's surface during an earthquake as a percent of the established rate of acceleration due to gravity.

Figure 1.7 shows the relative earthquake hazard zones in the Commonwealth of Pennsylvania. According to the map, Clearfield County is estimated to have a "very slight" earthquake hazard which means that it has a two percent exceedance level (two percent expectation of being exceeded in a period of 50 years) between 6 and 8 PGA. Roughly, ground acceleration must exceed 15 PGA for significant damage to occur, although soil conditions at local sites are extremely important in controlling how much damage will occur as a consequence of a given amount of ground acceleration.

1.4.2 Wildfires

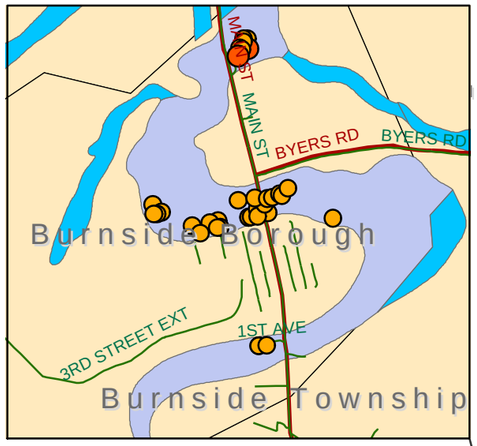
A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures. Wildfires often begin unnoticed and can spread quickly, creating dense smoke that can be seen for miles. A wildland fire is a wildfire in an area in which development is essentially nonexistent, except for roads, railroads, power lines and similar facilities. An urban-wildland interface fire is a wildfire in a geographical area where structures and other human development meet or intermingle with wildland or vegetative fuels.

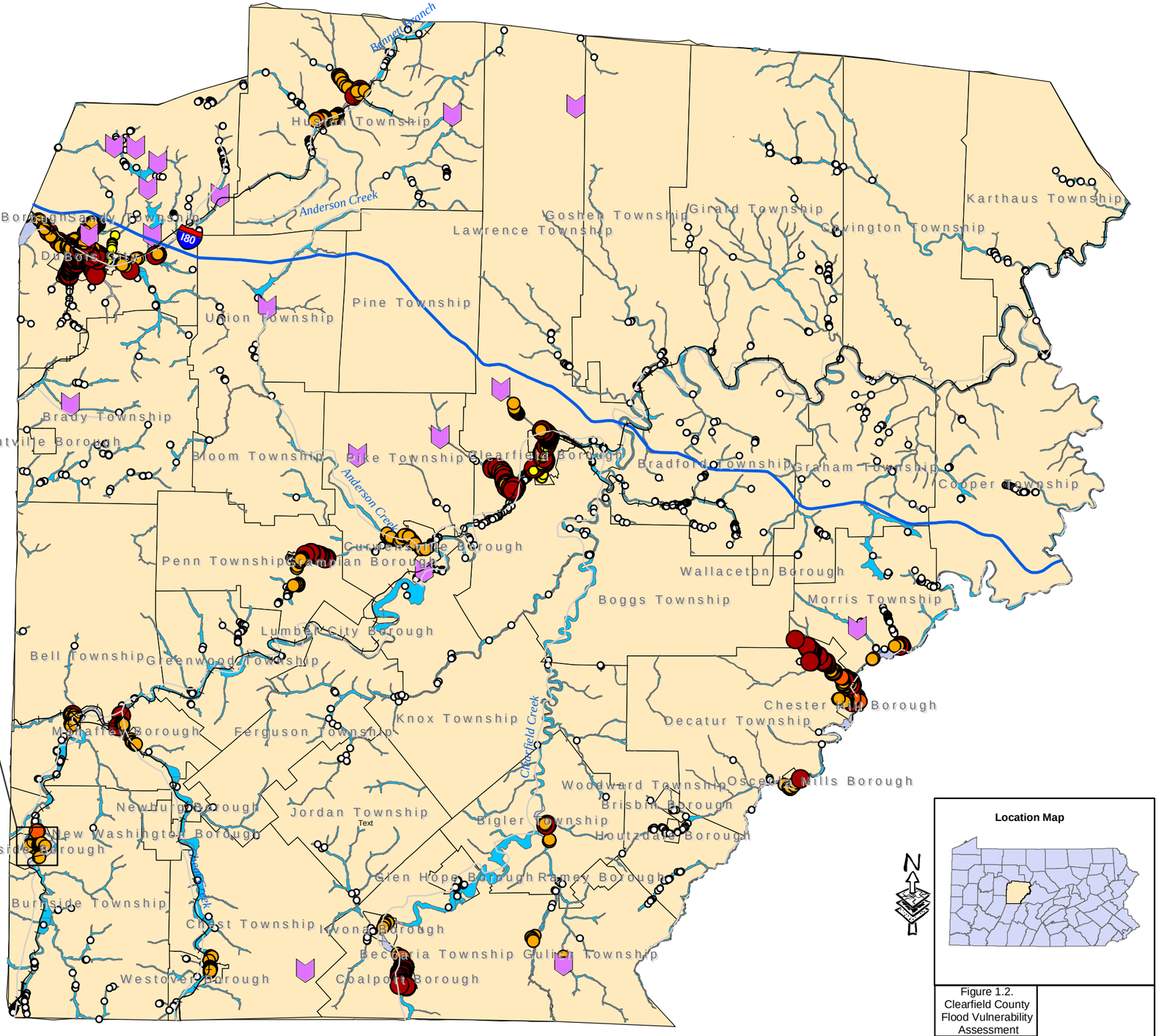
Wildfires can occur at any time of the year, but are most likely to occur in the County during a drought. Any small fire in a wooded area, if not quickly detected and suppressed, can get out of control. Most wildfires are caused by human carelessness, negligence and ignorance. However, some are precipitated by lightning strikes and in rare instances, spontaneous combustion.

Wildfires in Pennsylvania can occur in fields, grass, and brush as well as in the forest itself. In Clearfield County, more than half of the acreage consists of forested areas and croplands. Under dry conditions or droughts, wildfires have the potential to burn forests as well as croplands.

Per the County *Hazards Vulnerability Analysis*, "Between 1995 and 2000, there were 98 such incidents involving over 400 acres with damages exceeding $58,000. The County is not at a high risk for major wildland fires. Almost all of the wildland fires in the County occur in remote areas or areas away from residential structures. Unlike the wildland fires that occur in other parts of the country and affect vast areas of land and residences, most of the fires in the County are contained before they cause any damage or extensive property loss." Thus the relative risk of wildfires in Clearfield County is considered low.

Figure 1.2. Clearfield County Flood Vulnerability Assessment





Legend

Dams

Vulnerability

EXTREME	*Structures in floodway prone to >4 feet flooding*
HIGH	*Structures prone to 1 to 4 feet flooding*
LOW	*Structures prone to less than 1 foot flooding*
VERY LOW	*Structures in the 500 year floodplain*
UNKNOWN	*Structures in the floodplain where no base flood elevations were available*

Rivers_and_Streams

Railroad

Major Roads

Highway Class

- Interstate
- US Highway
- State Highway
- County Highway
- Off Interstate Business
- None

Q3 Floodplains

ZONE_

A	*No base flood elevations determined*
AE	*Base flood elevations determined*
X500	*Areas of the 500-year flood*

5 2.5 0 5 Miles

N

Location Map

Figure 1.2. Clearfield County Flood Vulnerability Assessment

Date: 04/07/2003

Figure 1.3. Tornado Activity in the United States

Source: FEMA 386-2, *Understanding Your Risks*

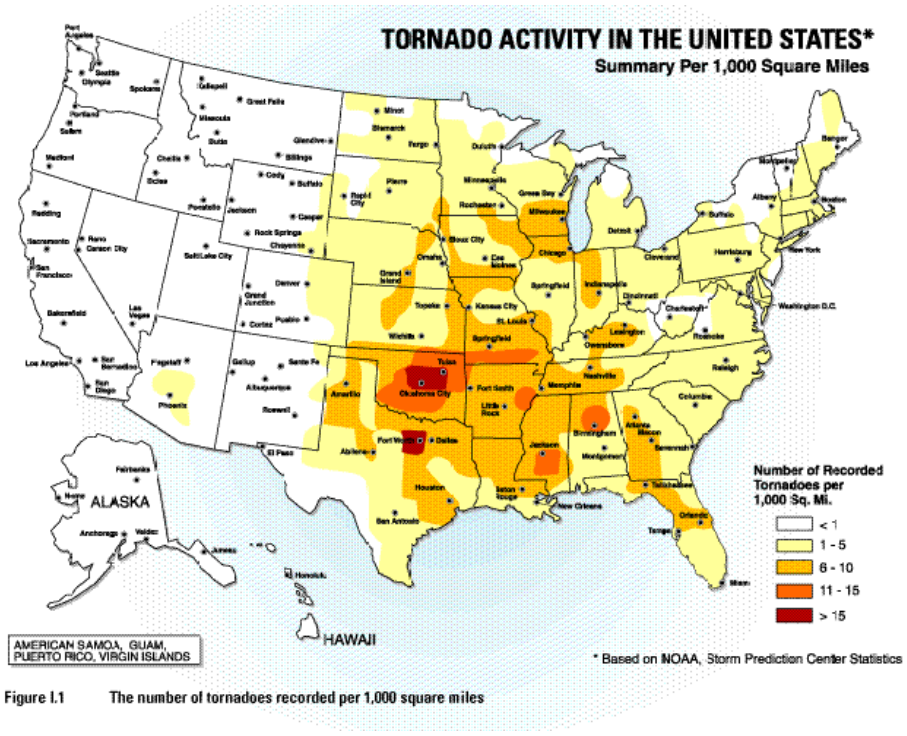


Figure 1.4. Wind Zones in the United States

Source: FEMA 386-2, *Understanding Your Risks*

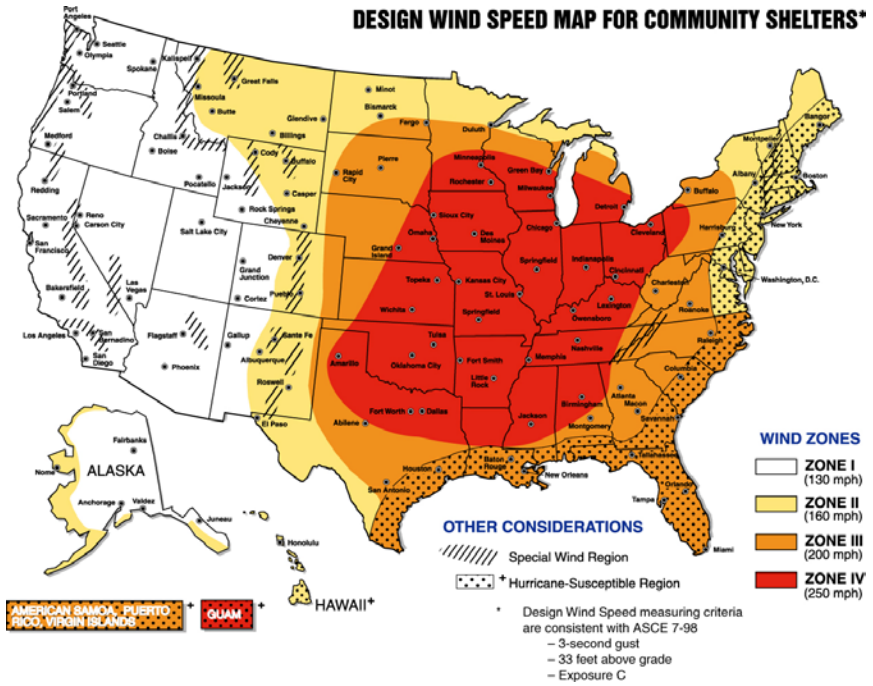


Figure 1.5. Landslide Hazard Susceptibility in Pennsylvania

Source: Delano, H. L., and Wilshusen, J. P., 2001, Landslides in Pennsylvania: Pennsylvania Geological Survey, 4th ser., Educational Series 9, 34 p. http://www.dcnr.state.pa.us/topogeo/hazards/es9.pdf

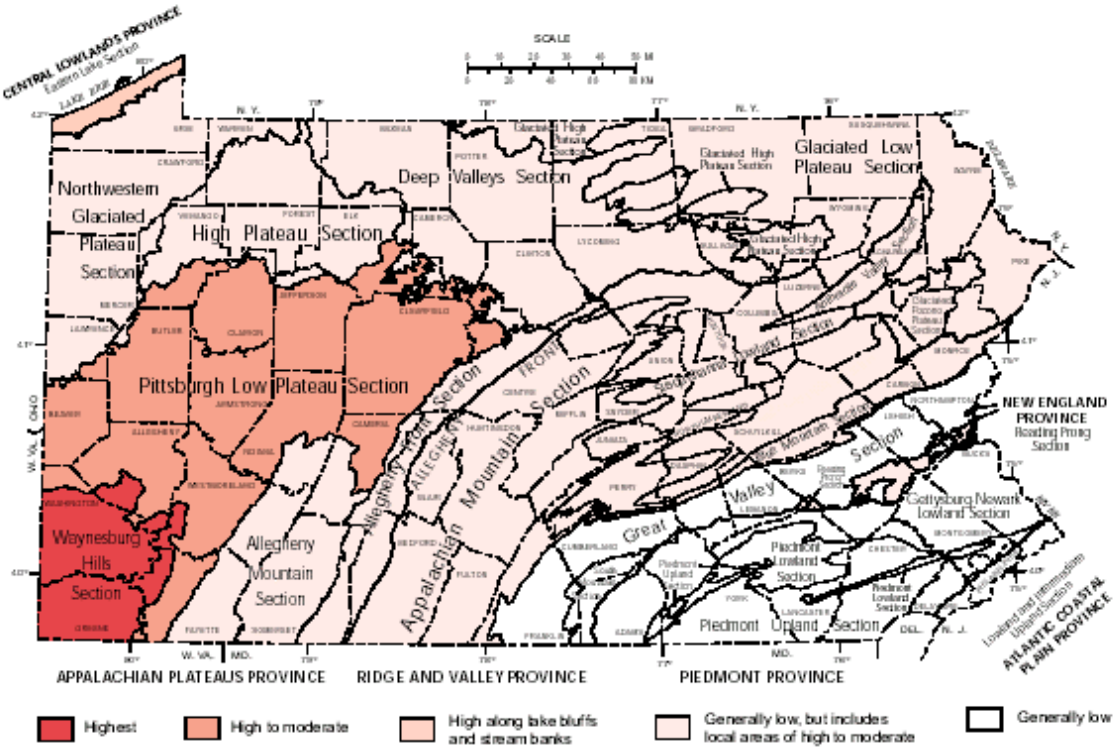
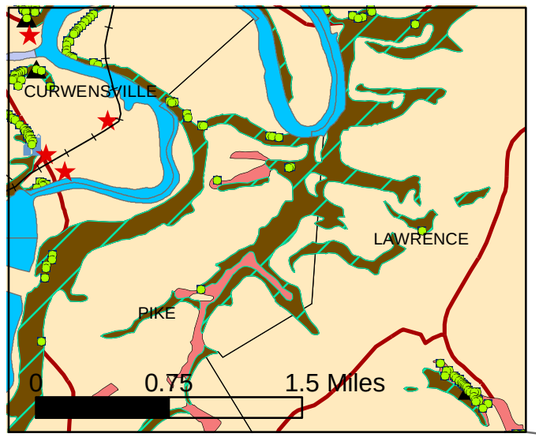
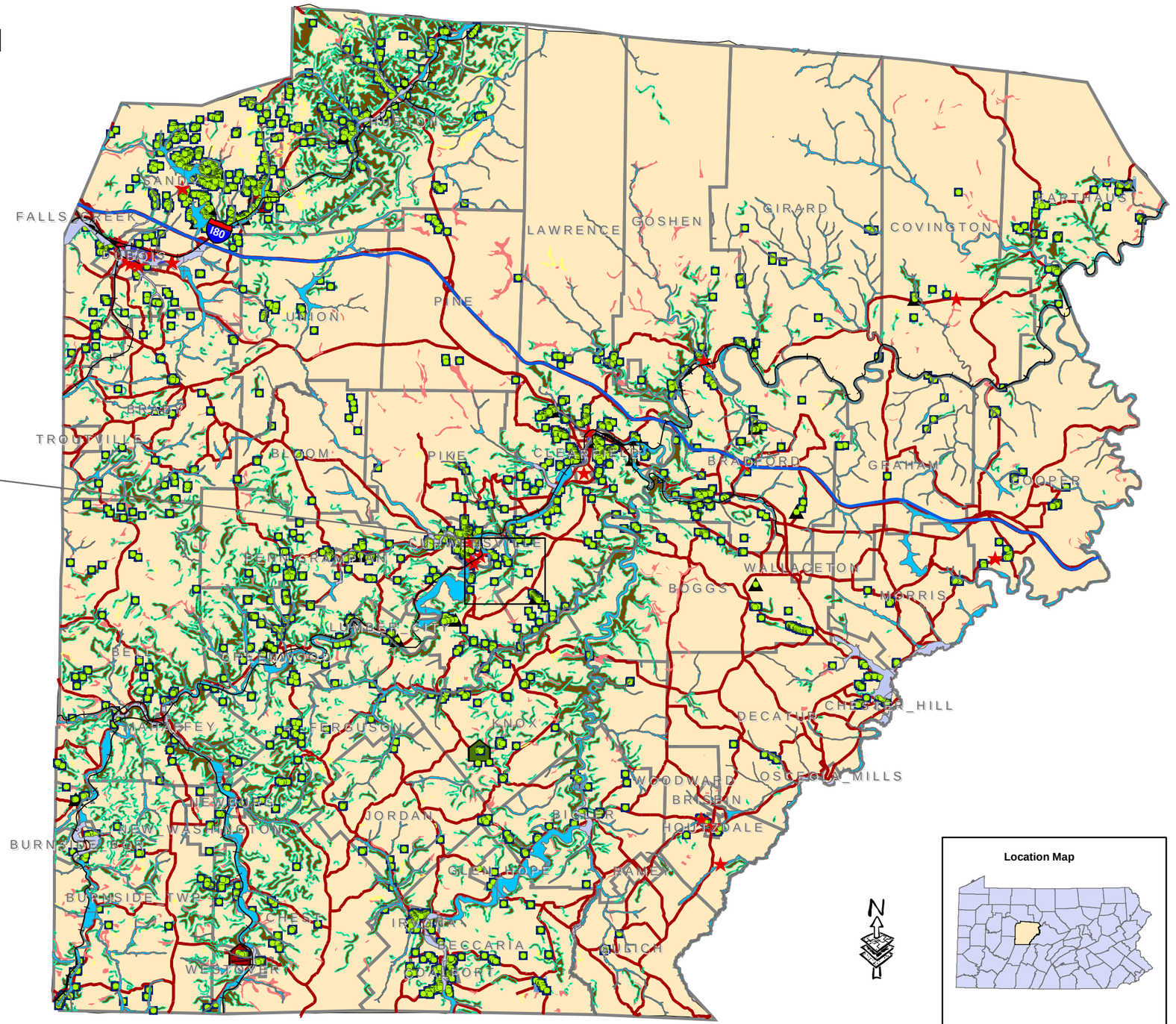


Figure 1.6. Clearfield County Land Failure Vulnerability Assessment





Legend

- Structures on Land Failure Areas
- STRUCTURE
- 9-1-1 CENTER
- BUSINESS
- CHURCH BLDG
- CLINIC
- COLLEGE
- FIRE CO
- GOVERNMENT BLDG
- HOSPITAL
- POLICE
- SCHOOL
- Highways
- Steep Slopes: Minimum slope greater than 25%

Vulnerable Soil Types

- Ernest
- Rayne
- Wharton

3 1.5 0 3 Miles

N

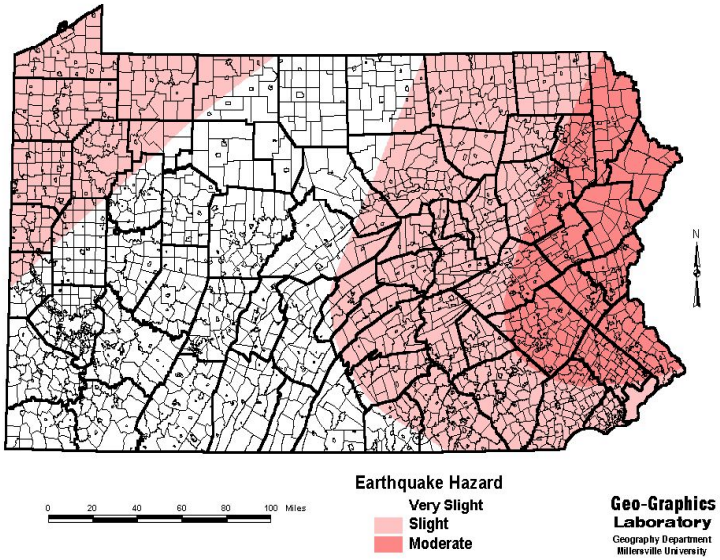
Location Map

Figure 1.6. Clearfield County Land Failure Vulnerability Assessment

DATE: 08/25/03

Figure 1.7. Earthquake Hazard Zones in Pennsylvania

Source: Millersville University



2.0 Mitigation Capabilities And Resources

Clearfield County has a number of resources that it can access to implement hazard mitigation initiatives. These resources include both private and public assets at the local, state, and federal levels.

2.1 Capabilities And Resources – Clearfield County

Table 2.1 summarizes the local-government capabilities the County's municipalities possess that will facilitate implementation of the mitigation strategy.

Clearfield County and the 51 municipalities within its boundaries have a very important relationship in which they share resources to ensure the effective implementation of ordinances and codes.

The most important capabilities that the municipalities utilize are zoning, land-use and floodplain-management ordinances and building codes. Through administration of the floodplain ordinances, the municipalities can ensure that all new construction or substantial improvements to existing structures that are located in the 100-year floodplain are built with first-floor elevations above the BFE.

Building codes are important in mitigation, because codes are developed for regions of the country in consideration of the hazards present within that region. Consequently, structures that are built to applicable codes are inherently resistant to many hazards like strong winds, floods, and earthquakes, and can help mitigate regional hazards like wildfires. In 2003 the Commonwealth of Pennsylvania implemented the Uniform Construction Code (Act 45 of 1999), a comprehensive building code that establishes minimum regulations for most new construction, including additions and renovations to existing structures. Local residential and non-residential code officials must register and obtain certification within three and five years, respectively. While some municipalities in Clearfield County had already instituted building codes prior to the mandate by the Commonwealth, all municipalities and the County will likely have to spend considerable time and resources retraining and becoming certified in the new requirements and revamping their administrative and enforcement procedures.

The County, townships, and incorporated municipalities have undertaken several important planning initiatives:

- Clearfield County developed and has been implementing its comprehensive planning document, and several of the municipalities have also adopted comprehensive plans. The County comprehensive plan promotes sound land use and regional cooperation among local governments to address planning issues.

Table 2.1 Local Mitigation Capability Assessment Matrix

Municipality Name	Residents (at 2000 Census)	Muni. Planning Com.	Muni. Comp. Plan	Comp. Plan w/ other Muni	Zoning Ord.	Muni. SALDO	County SALDO	Mobile Home Provis-ions	Building Permits Reqd.	Act 166 Floodplain Ordinance	Act 167 Storm Water Mgmt.	NFIP
Beccaria Township	1,835						X	X	X	X*		X
Bell Township	825	X	X*	Mahaffey Boro			X	X	X	X		X
Bigler Township	1,368						X	X	X	X*		X
Bloom Township	412						X	X	X			X
Boggs Township	1,837		X(3)	Wallaceton Boro		X		X	X	X*		X
Bradford Township	3,314	X				X		X	X	X		X
Brady Township	2,010	X	X			X		X	X		X	X
Brisbin Borough	413		X	Houtzdale Boro			X	X	X	X*		X
Burnside Borough	283						X	X	X	X*		X
Burnside Township	1,128						X	X	X	X		X
Chest Township	547						X	X				X
Chester Hill Boro	918						X	X	X	X		X
Clearfield Borough	6,631	X	X*	Lawrence Twp	X		X	X	X	X*		X
Coalport Borough	490						X	X	X	X		X
Cooper Township	2,731	X	X			X		X	X	X*		X
Covington Twnship	621					X		X	X	X*		X
Curwensville Boro	2,650	X	X		X	X		X	X	X*	X	X
Decatur Township	2,974		X*	Osceola Mills Boro		X(1)	X	X	X	X		X
DuBois (City of)	8,123	X	X		X	X			X	X*	X	X
Falls Creek Boro	44	X	X*		X*	X*		X*	X	X*	X	
Ferguson Township	410						X	X	X	X		X

Municipality Name	Residents (at 2000 Census)	Muni. Planning Com.	Muni. Comp. Plan	Comp. Plan w/ other Muni	Zoning Ord.	Muni. SALDO	County SALDO	Mobile Home Provis-ions	Building Permits Reqd.	Act 166 Floodplain Ordinance	Act 167 Storm Water Mgmt.	NFIP
Girard Township	674		X			X		X	X	X*		X
Glen Hope Boro	149						X	X		X*		X
Goshen Township	496					X		X	X	X		X
Graham Township	1,236		X			X		X*	X	X		X
Grampian Borough	441						X	X	X	X		X
Greenwood Twsp.	424						X	X		X*		X
Gulich Township	1,275						X	X	X	X		X
Houtzdale Borough	941		X	Brisbin Boro			X	X	X	X*		X
Huston Township	1,468						X	X	X	X	X	X
Irvona Borough	680						X	X	X	X*		X
Jordan Township	543						X	X	X	X*		X
Karthaus Township	811					X*		X	X	X*		X
Knox Township	705						X	X	X	X		X
Lawrence Township	7,712	X	X*	Clearfield Boro	X	X		X	X	X*		X
Lumber City Boro	86						X	X		X*		X
Mahaffey Borough	402	X	X*	Bell Twp			X	X	X			X
Morris Township	3,063	X	X[3]			X		X	X	X*		X
Newburg Borough	81						X	X				X
New Washington Borough	89						X	X	X	X*		X
Osceola Mills Borough	1,249		X*	Decatur Twp			X	X		X		X
Penn Township	1,326					X		X	X	X		X
Pike Township	2,309						X	X	X	X		X
Pine Township	77					X		X[2]	X			
Ramey Borough	525						X	X	X			

Municipality Name	Residents (at 2000 Census)	Muni. Planning Com.	Muni. Comp. Plan	Comp. Plan w/ other Muni	Zoning Ord.	Muni. SALDO	County SALDO	Mobile Home Provis-ions	Building Permits Reqd.	Act 166 Floodplain Ordinance	Act 167 Storm Water Mgmt.	NFIP
Sandy Township	11,556	X	X		X	X		X	X	X	X	X
Troutville Borough	224		X*				X	X	X			X
Union Township	918					X		X	X	X	X	X
Wallaceton Boro	350		X[3]	Boggs Twp			X	X				X
Westover Borough	458						X	X	X	X*		X
Woodward Twp	3,550		X		X	X		X	X	X*		X

* Previous records indicate these municipalities have such provisions, however the County does not currently have a copy of such information.

[1] Decatur Township is currently in the process of updating their SALDO. Until this is complete, Decatur Township falls under the County's SALDO.

[2] Pine Township's SALDO does not contain a separate section on mobile homes, but it does contain language indicating consideration of mobile home parks.

[3] Not adopted yet.

Source: Clearfield County Planning Commission and FEMA

- 19 of the 51 municipalities utilize subdivision and land development ordinances.
- 7 of the 51 municipalities have adopted zoning ordinances.
- 45 of the 51 municipalities require building permits for new construction.
- Few of the municipalities have building codes in place; however, as noted above, Pennsylvania will soon be implementing a statewide building code.
- All municipalities with properties in the 100-year floodplain have adopted floodplain management ordinances and participate in the NFIP.

There are several planning mechanisms available for incorporating the requirements of the hazard mitigation plan into other planning mechanisms, such as local comprehensive plans or capital improvement plans (see Table 2.1 and other text in this section). In addition, there are mitigation strategies and actions in this plan that relate to the aforementioned planning mechanisms as implementation tools (see Sections 4 and 5). Furthermore, this hazard mitigation plan will become a component of the County comprehensive plan, and municipal comprehensive plans are required to be consistent with the County's comprehensive plan. This hazard mitigation plan may also become integrated with the County's emergency operations plan and its watershed management plan.

Other Local Resources

The North Central Pennsylvania Regional Planning and Development Commission (NCPRPDC) is a regional multi-county development agency which, under the guidance of a public policy board, provides leadership, expertise and services to communities, businesses, institutions and residents. With their partners, the region's chamber of commerce and industrial development groups, NCPRPDC provides services to Cameron, Clearfield, Elk, Jefferson, McKean and Potter counties.

Other local organizations that could act as partners for future mitigation action include:

- Non-profit environmental organizations like the Merrill Linn Conservancy and local watershed associations;
- Business development organizations like the Chamber of Commerce and Rotary Club; and
- Historical and cultural agencies like the Clearfield County Historical Society.

2.2 Capabilities And Resources – Commonwealth Of Pennsylvania

Clearfield County may also be able to access several of the resources offered by the Commonwealth of Pennsylvania. One resource that may have particular application to hazard mitigation initiatives is the "Growing Greener" campaign. Growing Greener was signed into law in 1999 investing nearly $650 million in preserving farmland and protecting open space; eliminating the maintenance backlog in state parks; cleaning up abandoned mines and restoring watersheds; providing funds for recreational trails; helping communities address land use; and providing new and upgraded water and sewer systems. Many counties have received grants to address land-use and open space issues. Clearfield County could direct some of these funds (e.g. for recreational trails) towards hazard mitigation objectives like acquisition and demolition of flood-prone structures.

DCNR provides a single point of contact for communities seeking state assistance in support of local conservation initiatives. This assistance can take the form of grants, technical assistance, information exchange and training. A variety of programs are available, like the Pennsylvania Heritage Parks Program, Pennsylvania Recreational Trails Program, and the Technical Assistance Program which can help with public involvement. They have also conducted pre-application workshops for 'Growing Greener' and 'Keystone' grants through their Community Conservation Partnerships Program.

There are several state training programs available for Clearfield County and municipal government staff which can better equip them to handle hazard mitigation activities. Some examples include the "Building Code Enforcement: An Intergovernmental Approach," "Statewide Building Code: Understand Your Options, Make a Choice," "Basic Course for Zoning Officials," and "Stormwater Management." PEMA also offers training in conjunction with FEMA for emergency management and hazard mitigation activities with courses such as the "Hazardous Weather and Flooding Preparedness Course."

As part of Pennsylvania's Anti-Terrorism initiative the Task Force on Security has launched proposals geared to strengthening emergency preparedness, quickening response and enhancing communication and coordination at all levels. The proposals ranged from bolstering security at nuclear power plants and airports to expediting equipment acquisition for first responders.

Other potential sources of help from the Commonwealth include:

- Local Government Capital Projects Loan Program: Provides low-interest loans for up to 50 percent of the total cost of purchasing equipment up to a maximum of $25,000 or 50 percent of the total cost of municipal facility needs up to $50,000 for small local governments with populations of 12,000 or less;

- Shared Municipal Services: Provides grant funds to promote cooperation among municipalities, encouraging more efficient and effective delivery of municipal services like shared personnel activities or equipment or shared data processing operations;

- Land Use Planning and Technical Assistance Program: Provides grant funds for the preparation of community comprehensive plans and ordinances to implement them;

- Floodplain Land Use Assistance Program: Provides grants and technical assistance to encourage the proper use of land and the management of floodplain lands including the costs for clerical, technical and legal staff as well as advertising, public hearing, and consultant costs; and

- Community Revitalization Program: Provides grant funds to support local initiatives that promote social and economic diversity to ensure a productive tax base and good quality of life with projects like construction or rehabilitation of infrastructure, building rehabilitation, public safety, recreation, and acquisition.

2.3 Capabilities And Resources – Federal Resources

The federal government offers a number of mitigation-related funding and training resources. Funding opportunities such as the Pre-Disaster Mitigation Assistance program, the Flood Mitigation Assistance Program, and the Hazard Mitigation Grant Program require local governments to have a hazard mitigation plan in order to be eligible to receive such grants. Other possible funding sources include Community Development Block Grants and the Small Business Administration. The relationship between these funding sources and potential mitigation actions will be explained as part of the implementation strategy for this plan.

Through the Emergency Management Institute, the federal government offers training in all aspects of emergency management, including hazard mitigation. The courses available at the Institute are free to local government staff.

Other federal resources include:

- Weatherization Assistance Program: Minimizes the adverse effects of high energy costs on low-income, elderly, and handicapped citizens through client education activities and weatherization services like heating system modifications and insulation.

- Section 108 Loan Guarantee Programs: Provides loan guarantees as security for federal loans for acquisition, rehabilitation, relocation, clearance, site preparation, special economic development activities, and construction of certain public facilities

and housing.

- US Army Corp of Engineers: Provides planning and technical assistance for a wide range of activities including flood-damage reduction, dam safety, and emergency response.

- US Department of Agriculture: Provides disaster assistance through the following:

    - The Emergency Conservation Program provides emergency funding for farmers to rehabilitate farmland damaged by natural disasters and for carrying out emergency water conservation measures during periods of severe drought.

    - The Non-insured Crop Disaster Assistance Program provides financial assistance for non-insurable crop losses and planting prevented by disasters.

- Emergency Watershed Protection Program: Undertake emergency measures, including the purchase of flood plain easements, for runoff retardation and soil erosion prevention to safeguard lives and property from floods, drought, and the products of erosion on any watershed whenever fire, flood or any other natural occurrence is causing or has caused a sudden impairment of the watershed. It is not necessary for a national emergency to be declared for an area to be eligible for assistance. The program objective is to assist sponsors and individuals in implementing emergency measures to relieve imminent hazards to life and property created by a natural disaster. Activities include providing financial and technical assistance to remove debris from streams, protect destabilized streambanks, establish cover on critically eroding lands, repairing conservation practices, and the purchase of flood plain easements. The program is designed for installation of recovery measures.

Other potential federal resources are listed in Appendix D.

2.4 Conclusion

After conducting the mitigation capability assessment, the conclusion was reached that the County will need to rely on technical and financial assistance from regional, state, and federal resources to effectively implement hazard mitigation actions over the next five years. The constraints facing the County include limited staff resources and funds that can be directed to implementing hazard mitigation.

During the development of this plan and from reviewing other recent planning initiatives, it is readily apparent that the County has the capability to bring together citizens, government representatives, and local officials to work closely together in crafting a better future for their communities. That same cooperative effort, if joined with the

appropriate technical and financial assistance from regional, state and federal resources, can be harnessed to implement the priority hazard mitigation actions described in Section Four of this plan. A sustained effort by the citizens, staff, and local officials can create a more sustainable and disaster-resistant future for Clearfield County.

3.0 Mitigation Goals and Objectives

3.1 Terminology

- **Goals** are general guidelines that explain what you want to achieve. Goals are usually expressed as broad policy statements representing desired long-term results.
- **Objectives** describe strategies or implementation steps to attain the identified goals. Objectives are more specific statements than goals; the described steps are usually measurable and can have a defined completion date.
- **Actions** provide more detailed descriptions of specific work tasks to help a community achieve the goals and objectives. For each objective statement, there are alternatives for mitigation actions that must be evaluated to determine the best choices for each situation (see *Section Three: Alternative Mitigation Actions*).
- **Mitigation Plan** include a listing and description of the preferred mitigation actions and the strategy for implementation, i.e., who is responsible, how will they proceed, when should action be initiated and/or completed, etc. (see *Section Four: Mitigation Plan and Implementation Strategy*).

This section of the **Hazard Vulnerability Assessment and Mitigation Plan for Clearfield County**, Pennsylvania identifies the goals and objectives for the project.

In meetings held in late 2003, citizens and local government representatives reviewed and prioritized goals and objectives based on the findings of the vulnerability assessment. Participants felt that priority should be given to mitigation actions that protect people, property, local government functions, and the local economy from the effects of hazards.

The goals developed for the Clearfield County Hazard Mitigation Plan are listed on the following page and were developed in response to the vulnerability findings presented in Section One and the desires of Clearfield County citizens**.** The following hazard mitigation goals for the Commonwealth of Pennsylvania's were also considered in this process:

1. Encourage actions that support: public safety during hazard events; natural hazard identification and awareness; hazard avoidance; damage minimization; environmental historic protection; and the mitigation of future severe and repetitive damage due to natural hazards.

2. Ensure that local and state agencies identify critical buildings, facilities, and infrastructure that are at risk of damage due to natural hazards, and to undertake

feasible and cost-effective hazard mitigation measures to minimize future losses and expenditures.

3. Make hazard mitigation a public value.

4. Promote economic development consistent with floodplain management, building codes, and similar guidance.

5. Develop an effective public awareness programs for the natural hazards that Pennsylvania is most likely to experience.

6. Encourage scientific study of natural hazards and the development of data to support mitigation strategies for those hazards that are a threat to the Commonwealth.

7. Promote recognition of the value of hazard mitigation to the health, safety, and welfare of the population.

3.2 Goals

- Reduce possibility of injury/death to County residents and reduce potential damage to existing community assets (including critical facilities and infrastructure) due to:
    - Flooding;
    - Severe weather (i.e., winter storms, tornadoes); and
    - Land failure.

- Promote disaster-resistant future development.

- Promote hazard mitigation as a public value in recognition of its importance to the health, safety, and welfare of the population.

- Improve response and recovery capabilities.

3.3 Objectives

The goals in Section 3.2 were used to develop draft objectives. These objectives addressed in more specific terms the results of the vulnerability assessment and reflected the nature of what can be mitigated for the identified hazards as well as existing limitations in data and information. These draft objectives were presented to the HMPC for review and comment, and shown in final form in Section 4.

4.0 Alternative Mitigation Actions

4.1 Introduction

This section includes an overview of alternative mitigation actions based on the goals and draft objectives identified in Section Two. For Goals 1 to 5, the actions are related to addressing vulnerability of existing facilities and assets. Actions identified for Goals 6 and 7 address future development implications and broader issues of public awareness.

There are six general approaches to reducing hazard risks:

- Preventive measures,
- Property protection,
- Emergency services measures,
- Structural projects,
- Natural resource protection, and
- Public information.

Preventive Measures keep problems from getting started or getting worse. The use of known hazard areas, like floodplains for example, can be limited through planning, land acquisition, or regulation. These activities are usually administered by building, zoning, planning, and/or code enforcement officials:

- Planning and zoning,
- Open space preservation,
- Building codes and enforcement,
- Stormwater management, and
- Drainage system maintenance.

Property Protection measures are those actions which go directly to permanently getting people, property, and businesses out of unsafe areas where, in terms of wise disaster planning, they shouldn't have been in the first place.

The first of these measures is *property acquisition*: public procurement and management of lands that are vulnerable to damage from hazards. For example flood-damaged homes have been purchased by municipalities (using state, federal, and local funds) and removed from flood-prone areas (by demolition or relocation). The acquired land then becomes public property which can only be used as "open space" in the future. Open space use means that future development of the site is restricted to low-impact uses like parks, playing fields, gravel parking lots or agriculture--no permanent or enclosed structures.

Relocation of at-risk structures also achieves the same result as acquisition. The home or business is moved to a safer location, but it remains the property of the individual owner

while the original site is purchased and maintained by the local municipality. Elevation of structures can be an effective in-place mitigation for some flood-threatened homes. By raising the height of the structure's living area above flood levels, damage and threat to life can be reduced. Retrofitting of homes is another in-place damage reduction method. Utilities, services, systems and appliances in some homes can be raised above flood levels.

Construction techniques to improve structural resistance to high wind or heavy snow accumulation can be incorporated into new homes or retrofitted into existing structures. Private home and business insurance policies and participation in the National Flood Insurance Program can also reduce uninsured losses to properties.

Emergency Services Measures are taken during a disaster to minimize its impact. These measures are the responsibility of city or county emergency management staff, operators of major and critical facilities, and other local emergency service organizations. They include:

- Alert warning systems,
- Monitoring systems,
- Emergency response planning,
- Evacuation,
- Critical facilities protection, and
- Preservation of health and safety.

Structural Projects are usually designed by engineers and managed and maintained by public works staffs. They are designed to reduce or redirect the impact of natural disasters (especially floods) away from at-risk population areas. Examples include:

- Reservoirs
- Levees, floodwalls
- Diversions
- Channel modifications
- Storm sewers

Natural Resource Protection preserves or restores natural areas or their natural functions. Such measures are usually implemented by park & recreation organizations, conservation agencies or wildlife groups. They include:

- Wetland protection,
- Best management practices,
- Erosion and sediment control, and
- Riverine protection.

Public Information Programs advise property owners, potential property owners, and

others of hazards and ways to protect people and property from them. They are usually implemented by a public information office. Public information activities can include:

- Flood maps and data
- Library resources
- Outreach projects
- Technical assistance
- Real estate disclosure information
- Environmental education programs

4.2 Alternative Flood Mitigation Actions

In Clearfield County, damage from flooding is caused by development in naturally occurring floodplains, therefore potential mitigation actions involve various techniques for property protection, e.g., acquisition and removal of structures from flood-prone properties, elevation of flood-prone structures above the base flood elevation, etc. Appendix C describes a variety of property protection actions that can be taken to mitigate hazards and evaluates their feasibility based on characteristics of the flood hazard, characteristics of the affected structures, and accepted uses of the action. However, as discussed in earlier sections of this plan, there are fundamental data limitations in Clearfield County that restrict the ability to determine the most appropriate mitigation actions for most affected properties at this time. Therefore the initial efforts for flood mitigation in Clearfield County focus on gathering additional information to assist the County HMPC in making more detailed decisions about appropriate mitigation actions in the future.

The following are alternatives for flood mitigation actions organized according to the goals and objectives from Section Two.

Goal 1:	Reduce potential injury/death and damage to existing community assets due to **flooding.**

Goal 1 Objectives:

1.A Identify and evaluate protection of existing critical facilities with the highest relative vulnerability in the 100-year floodplain.

- *Action 1: Identify existing critical facilities with the highest relative vulnerability.*
- *Action 2: Conduct cost-benefit analysis of protection of those assets.*

1.B Identify and evaluate strategies for repetitive-loss properties.

- *Action 1: Identify existing repetitive-loss and substantial-damage properties (floodplain managers).*

- *Action 2: Conduct cost-benefit analysis of protection of repetitive-loss assets.*

1.C Implement flood-control structural projects that have previously been defined (i.e., DuBois, Coalport).

- *Action 1: Identify funding mechanisms for flood-control projects.*

- *Action 2: Implement projects as funds become available.*

1.D Provide public outreach/education regarding strategies (e.g., floodproofing) for property owners in 100-year floodplain.

- *Action 1: Work with township/borough officials to increase awareness among property owners including informational mailings to property owners in the 100-year floodplain, and sponsoring a series of workshops about costs and benefits of:*

  - *Acquiring flood insurance coverage, and*

  - *Property elevation, dry floodproofing, and wet floodproofing.*

- *Action 2: Evaluate at the township/borough level the suitability of Community Rating System (CRS)[15] for insurance premium reduction (and flood damage reduction).*

- *Action 3: Consider using Westover as a "success story" for flood risk management.*

1.E Address identified data limitations regarding lack of detailed information about individual structures located in the 100-year floodplain.

- *Action 1: Obtain information for structures in the areas with the highest relative vulnerability to determine the best property protection methods. The information to be obtained includes:*

  - *Lowest-floor elevation,*

  - *Number of stories,*

[15] The Federal CRS has been developed to provide incentives for communities to go beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding. The incentives are in the form of insurance premium discounts.

- *Presence of a basement, and*
- *Market and/or replacement value.*

➢ *Action 2: Obtain information for all remaining structures in the 100-year floodplain to determine the best property protection methods to promote with individual property owners. Techniques for gathering information over time should include developing and implementing a program for integrated information "capture" at key points in normal township administrative procedures, including applications for building permits at township/borough offices.*

1.F Identify and evaluate protection for hazardous material storage in floodplain.

➢ *Action 1: Identify all storage of hazardous materials in floodplains (including non-addressable structures, such as propane tanks).*

➢ *Action 2: Evaluate alternative methods to minimize risk from existing storage areas.*

➢ *Action 3: Assess means to prevent future storage in floodplain.*

1.G Obtain updated detailed flood studies and FIRMs (including 500-year flood) for areas with the greatest potential damage and threat to residents.

➢ *Action 1: Apply to FEMA for funding to undertake detailed flood studies for County's high-hazard areas to determine BFE and a full range of flood-recurrence intervals (2, 5, 10, 25, 50 and 100-year events) for use in future refinements of the mitigation plan.*

➢ *Action 2: Apply to FEMA for updates of the most outdated FIRMs for high-hazard areas.*

4.3 Alternative Severe Weather Mitigations Actions

There are a number of mitigation actions that can be used to mitigate severe weather hazards. Unlike hazards like flood that have limited geographic extents, severe weather potentially affects the entire County. Therefore, strategies for identifying weather mitigation actions usually involve identifying individual structures with known/assumed vulnerability or particular critical facilities. Additional efforts might include actions that can reach the entire County through public education or improving County implementation capabilities and strengthening regulations.

Appendix C includes a list of weather hazard mitigation actions with information about their suitability for use in Clearfield County. As with the flood hazards in Clearfield County, additional information is needed in most cases to determine appropriate actions. Therefore, the following alternatives for severe weather mitigation actions include a number of additional data gathering and study efforts to obtain information to use in subsequent refinements and revisions of this mitigation plan.

Goal 2:	Reduce potential injury/death and damage to existing community assets due to **severe weather.**

Goal 2 Objectives:

2.A Identify vulnerable buildings/populace and critical facilities; develop a comprehensive approach to reducing the possibility of damage and loss of function to those structures (and potential threat to residents) due to the effects of severe weather.

- *Action 1: Conduct qualitative evaluation process for critical facilities and infrastructure to determine relative vulnerability and gather information for subsequent refinements of this mitigation plan.*
- *Action 2: Develop action plan for reducing potential losses at identified critical facilities and infrastructure.*

2.B Assess availability of backup power resources (generators) for critical facilities.

- *Action 1: Identify critical facilities with the highest relative vulnerability to the effects of power outage (i.e., hospitals, nursing homes, fire, police, rescue, and emergency management).*
- *Action 2: Assess availability of backup power resources (generators) for those facilities.*
- *Action 3: Upgrade backup power resources as necessary.*

2.C Evaluate communities that require warning systems and storm shelters.

- *Action 1: Identify residents with the highest relative vulnerability to the effects of severe weather and prepare implementation plan.*
- *Action 2: If warranted, implement additional storm shelters and warning systems, including:*

- *Community sirens,*
- *Real-time weather data for emergency management personnel,*
- *NOAA weather radios for vulnerable populace, or*
- *"Reverse 911" systems.*

2.D Evaluate means of managing stranded travelers during winter storms.

➢ *Action 1: Conduct qualitative evaluation process for managing stranded travelers (e.g., temporary shelters).*

2.E Provide public outreach/education for mobile-home owners on proper anchoring.

➢ *Action 1: Work with township/borough officials to increase awareness among mobile-home owners (i.e., informational mailings, workshops) about costs and benefits of proper anchoring.*

2.F Address identified data limitations regarding lack of detailed information about characteristics of individual structures such as construction type, age, condition, presence of basement, compliance with current building codes, etc.

➢ *Action 1: Develop a linkage between the County tax assessment records and parcels in the County GIS to allow future revisions of this plan to more easily incorporate information about property values, construction types, etc.*

4.4 Alternative Land Failure Mitigations Actions

Land failures do not currently pose a significant threat to most assets in Clearfield County. However, there are discrete areas where the possibility of damage and loss of life is significant enough to warrant attention. As with other hazards, Appendix C includes typical mitigation actions that can be taken to address land failures, but there are also similar limitations to the data available to make detailed determinations for risks. Therefore, the following recommendations for actions include a number of follow-on efforts to better assess relative vulnerability and risk.

Goal 3:	Reduce potential injury/death and damage to existing community assets due to **land failure.**

Goal 3 Objectives:

3.A Develop a comprehensive approach to reducing the possibility of damage and loss due to future rock falls and other land failures in identified high-hazard areas.

- *Action 1: Conduct detailed field assessments at critical facilities and infrastructure vulnerable to land failure to determine the best option for protection. Assessments should include presence of visible separation of rock materials and any evidence of recent land failure.*

- *Action 2: Develop action plan (including benefit/cost comparisons) for feasible alternatives for reducing potential damage at identified critical facilities and infrastructure.*

4.5 Mitigation Actions To Guide Developments & Promote Public Awareness

Two of the remaining goals address important aspects of the mitigation planning effort for Clearfield County that go beyond addressing existing problem areas. These goals are based on the ideas of prevention through appropriate land-use and development controls and increasing the general awareness of the public regarding the potential effectiveness of mitigation actions at the individual, community and county level.

Goal 4:	Promote disaster-resistant future development

Goal 4 Objectives:

4.A Encourage and facilitate the development or revision of comprehensive plans and zoning/land-use ordinances to limit development in high-hazard areas.

- *Action 1: Distribute and promote the inclusion of vulnerability analysis information as part of periodic plan review and revisions at the township/borough level.*

- *Action 2: Present cost/benefit analysis to townships/boroughs that do not have comprehensive plans and/or zoning/land-use ordinances.*

4.B Encourage and facilitate the adoption of building codes that provide protection for new construction and substantial renovations from the effects of identified hazards.

- *Action 1: Evaluate adequacy of township/borough building codes.*
- *Action 2: Encourage adoption of International Building Code in all townships/boroughs.*

4.C Provide adequate and consistent enforcement of ordinances and codes within and between jurisdictions.

- *Action 1: Train the municipal building inspectors to consistently enforce the building code from jurisdiction to jurisdiction.*

4.D Protect future development from damage from winter storm hazards.

- *Action 1: Integrate evaluation of snow-removal and emergency access logistics with new development planning.*
- *Action 2: Evaluate cost-effectiveness of increasing design wind and/or snow load for future development.*

Goal 5:	Promote hazard mitigation as a public value in recognition of its importance to the health, safety, and welfare of the population

Goal 5 Objectives:

5.A Provide public education to increase awareness of hazards and opportunities for mitigation.

- *Action 1: Identify and publicize success stories as part of an overall consistent public relations program.*

5.B Promote partnerships between the municipalities and the County to continue to develop a County-wide approach to identifying and implementing mitigation actions.

- *Action 1: Convene regular meetings of the HMPC to discuss issues and progress related to the implementation of the plan.*

5.C Continue the promotion of disaster resistance in the business community via the hazard mitigation planning initiative.

- *Action 1: Renew and expand commitments to hazard mitigation planning among partner organizations.*

4.6 Related Response And Recovery Issues

The following objectives have been discussed during the development of this plan that relate primarily to Response and Recovery activities and would likely not be "funded" by State or Federal sources as "mitigation". However, they can be included as part of the mitigation plan recommendations for consideration of future actions by county and township emergency managers.

Goal 6:	Improve Response and Recovery Capabilities

Goal 6 Objectives:

6.A Increase awareness by residents (i.e., through public outreach/education) of actions to take during an emergency.

- *Action 1: Increase awareness by residents of actions to take during an emergency, including sheltering and evacuation procedures. Methods to be used can include through public outreach (i.e., web site, mailings, workshops, media coverage) and education.*

6.B Enhance response capability of County and municipal fire, police, and emergency medical services personnel to special populations.

- *Action 1: Identify special populations requiring additional emergency response.*
- *Action 2: Evaluate means to enhance response capability for those residents.*

4.9 Conclusions

The preceding includes approximately 45 action items, many of which will require substantial commitments of time by County and township staff. It is unrealistic to assume that the individuals working for these entities will have the time and resources to pursue all of these activities within the planning horizon for this plan, i.e., over the next five years, i.e., the planning horizon for this plan relative to the requirements of DMA 2000. To focus the energies of these individuals and related organizations, it was necessary to determine priorities for actions.

The mitigation options presented in this section were evaluated in light of the expressed desires of the community using the following criteria which assess the suitability of options based on their social effect on the County and municipalities, their technical feasibility, and their support with residents and local officials. The Staple+E evaluation

method (see table below) categorizes these factors into social, technical, administrative, political, economic, and environmental criteria.

Table 4.1. Staple + E Criteria

Criteria	Considerations
Social	• Will it cause any one segment of the population to be treated unfairly? • Will the action disrupt established neighborhoods, break up voting districts or cause the relocation of low and moderate income people? • Is the action compatible with present and future community values? • Will the measures adversely affect cultural values or resources?
Technical	• How effective is the measure in avoiding or reducing future losses? • Will it create more problems than it solves? • Does it solve a problem or only a symptom? • In light of other community goals, is it the most useful?
Administrative	• Does the community have the capability to accomplish the action (i.e. can you implement the mitigation action)? • Can the community provide any maintenance necessary? • Is there enough staff, technical experts and funding? • Can it be accomplished in a timely manner?
Political	• Who are the stakeholders in this proposed action? • Have all of the stakeholders been offered an opportunity to participate in the planning process? • How can the mitigation goals be accomplished at the lowest cost to the stakeholders? • Is there public support both to implement and maintain this measure? • Is the political leadership willing to propose and support the favored measure?
Legal	• Does the community have the authority to implement the proposed measure? • Is there a clear legal basis for the mitigation action? Is an ordinance or resolution necessary? • What are the legal side effects? • Will the community be liable for the actions or support of actions, or lack of action? • Is it likely to be challenged?
Economic	• What are the costs and benefits of this measure? • How will the implementation of this measure affect the pocketbook of the community? • Does the cost seem reasonable for the size of the problem and likely

Criteria	Considerations
	benefits? • What burden will be placed on the tax base or local economy? • Does the action contribute to other community economic goals such as capital improvements or economic development? • What benefits will action provide?
Environmental	• How will this action affect the environment? • Will this measure comply with local, state and federal environmental regulations? • Is the action consistent with community environmental goals? • Are endangered or threatened species likely to be affected?

Source: FEMA publication 386-3, *Developing the Mitigation Plan*

Using STAPLE+E criteria, the mitigation alternatives were scored as shown in Table 4.2. Note that costs and benefits of the various mitigation actions were considered during the prioritization process under the "economic" element of the STAPLE+E criteria. As an example of this, note that action 1.C.1 (flood-control structural projects) in Table 4.2 is much less cost-effective than action 1.B.1 (evaluating repetitive flood-loss properties), and therefore the former was rated a "0" under the "economic" element as compared to a "2" for the latter.

Section Five of this plan reflects the results of a meeting of the Clearfield County HMPC on March 23, 2004, at which time the committee members identified priority items that are included in the resulting implementation strategy. Using STAPLE+E criteria, the mitigation alternatives were scored as shown in Table 4.2.

Table 4.2. Ranking Alternative Mitigation Actions for Clearfield County

No.	Mitigation Action	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Raw Score	Weighting	STAPLEE Score
Flooding											
1.A.1	Identify existing *critical facilities with the highest relative vulnerability*; conduct cost-benefit analysis of protection of those assets.	3	3	2	3	3	2	3	19	5	95
1.B.1	Identify existing *repetitive-loss properties*; conduct cost-benefit analysis of protection of repetitive-loss assets.	3	3	2	3	3	2	3	19	5	95
1.C.1	Implement *flood-control structural projects* that have previously been defined (i.e., DuBois, Coalport). Identify funding mechanisms for flood-control projects and implement projects as funds become available.	3	1	2	3	3	0	1	13	3	39
1.D.1	*Provide public outreach/education*: Work with township/borough officials to increase awareness among property owners including informational mailings to property owners in the 100-year floodplain, and sponsoring a series of workshops about costs and benefits of: -- Acquiring and minimizing the cost of flood insurance coverage, and -- Property elevation, dry and wet floodproofing.	3	2	1	2	3	2	3	16	3	48
1.D.2	Evaluate at the township/borough level the suitability of Community Rating System (CRS) for insurance premium reduction (and flood damage reduction).	3	3	1	2	3	2	3	17	3	51
1.D.3	Consider using Westover as a "success story" for flood risk management.	3	1	1	3	3	2	3	16	3	48
1.E.1	*Address lack of detailed information on individual structures:* Obtain information for structures in the areas with the highest relative vulnerability to determine the best property protection methods. The information to be obtained includes lowest-floor elevation, No.of stories, presence of basement, and market and/or replacement value.	3	3	1	3	3	1	3	17	4	68
1.E.2	Obtain information for all remaining structures in the 100-year floodplain to determine the best property protection methods to promote with individual property owners. Techniques for gathering information over time should include developing and implementing a program for integrated information "capture" at key points in normal township administrative procedures, including applications for building permits at township/borough offices.	3	2	0	3	3	0	3	14	4	56
1.F.1	Identify and evaluate *protection for hazardous material storage in floodplain*. -- Identify all storage of hazardous materials in floodplains (including non-addressable structures, such as propane tanks). -- Evaluate alternative methods to minimize risk from existing storage areas. -- Assess means to prevent future storage in floodplain.	3	3	1	3	2	1	3	16	4	64
1.G.1	*Obtain updated detailed flood studies & FIRMs*: Apply to PEMA for funding to undertake detailed flood studies for County's high-hazard areas to determine BFE and a full range of flood-recurrence intervals (2, 5, 10, 25, 50 and 100-year events) for use in future refinements of the mitigation plan.	4	2	1	3	3	2	3	18	4	72
1.G.2	Apply to FEMA for updates of the most outdated FIRMs for high-hazard areas.	4	2	1	3	3	2	3	18	4	72
Severe Weather											
2.A.1	Conduct qualitative evaluation of *critical facilities/infrastructure* to determine relative vulnerability and gather information for subsequent refinements of mitigation plan.	3	2	1	3	3	2	3	17	4	68
2.A.2	Develop action plan for reducing potential damage and loss of function at identified critical facilities and infrastructure.	3	2	1	3	3	2	3	17	4	68
2.B.1	Identify critical facilities with the highest relative vulnerability to the effects of *power outage* (i.e., hospitals, nursing homes, fire, police, rescue, and emergency management). Assess availability of backup power resources (generators) for those facilities.	3	3	2	3	3	2	3	19	4	76
2.B.2	Upgrade backup power resources as necessary.	3	3	2	3	3	1	3	18	4	72
2.C.1	Identify *residents with the highest relative vulnerability* to the effects of severe weather and prepare implementation plan.	3	2	1	2	3	2	3	16	4	64

Table 4.2. Ranking Alternative Mitigation Actions for Clearfield County

No.	Mitigation Action	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Raw Score	Weighting	STAPLEE Score
2.C.2	If warranted, implement additional storm shelters and warning systems, including: -- Community sirens, -- Real-time weather data for emergency management personnel, -- NOAA weather radios for vulnerable populace, or -- "Reverse 911" systems.	2	3	1	1	3	0	3	13	4	52
2.D.1	Conduct qualitative evaluation process for *managing stranded travelers* (e.g., temporary shelters).	2	2	1	2	3	2	3	15	3	45
2.E.1	Work with township/borough officials to increase *awareness among mobile-home owners* (i.e., informational mailings, workshops) about costs and benefits of proper anchoring.	3	3	2	2	3	3	3	19	3	57
2.F.1	*Address lack of detailed information on individual structures:* Develop a linkage between the County tax assessment records and parcels in the County GIS to allow future revisions of this plan to more easily incorporate information about construction type, age, condition, presence of basement, etc.	3	2	1	3	3	2	3	17	3	51
Land Failure											
3.A.1	Develop a comprehensive approach to reducing the possibility of *damage and loss due to land failure* in identified high-hazard areas. Conduct detailed field assessments at critical facilities and infrastructure vulnerable to land failure to determine the best option for protection. Assessments should include presence of visible separation of rock materials and any evidence of recent land failure.	2	2	1	2	3	1	3	14	4	56
3.A.2	Develop action plan (including benefit/cost comparisons) for feasible alternatives for reducing potential damage at identified critical facilities and infrastructure.	3	3	2	3	3	3	3	20	3	60
Future Development											
4.A.1	*Encourage/facilitate development/revision of comprehensive plans, zoning/land-use ordinances to limit development in high-hazard areas*: Distribute, promote inclusion of vulnerability analysis information as part of periodic plan review and revisions at township/borough level.	3	3	2	2	3	3	3	19	3	57
4.A.2	Present cost/benefit analysis to townships/boroughs that do not have comprehensive plans and/or zoning/land-use ordinances.	3	2	1	2	3	2	3	16	3	48
4.B.1	Evaluate adequacy of township/borough building codes.	3	2	1	2	2	2	3	15	3	45
4.B.2	Encourage *adoption of International Building Code* in all townships/boroughs.	3	3	3	2	2	3	3	19	3	57
4.C.1	Train the municipal building inspectors to consistently *enforce the building code* from jurisdiction to jurisdiction.	3	3	1	2	1	2	3	15	3	45
4.D.1	Integrate evaluation of *snow-removal and emergency access logistics* with new development planning.	3	2	2	3	3	2	3	18	3	54
Promote Hazard Mitigation as Public Value											
5.A	Identify and publicize success stories as part of an overall consistent public relations program.	3	3	2	3	3	3	3	20	3	60
5.B	Convene regular meetings of the HMPC to discuss issues and progress related to the implementation of the plan.	3	3	2	3	3	3	3	20	3	60
5.C	Renew and expand commitments to hazard mitigation planning among partner organizations.	3	3	2	2	3	3	3	19	3	57
Response & Recovery											
6.A	Increase awareness by residents of actions to take during an emergency, including sheltering and evacuation procedures. Methods to be used can include through public outreach (i.e., web site, mailings, workshops, media coverage) and education.	2	3	2	3	3	3	3	19	3	57
6.B.1	Identify special populations requiring additional emergency response.	3	3	1	2	3	2	3	17	3	51
6.B.2	Evaluate means to enhance response capability for those residents.	3	3	1	2	3	2	3	17	3	51

Notes

1.Alternate objectives are color-highlighted to facilitate grouping; the objectives within each group are italicized.

2. Ratings: 0 = Poor, 1 = Fair, 2 = Good, 3 = Excellent

3. Weighting based on number of county residents that are affected by hazard and the efficacy of the actions; the last three objectives were equally rated at 3.

5.0 Mitigation Plan & Implementation Strategy

5.1 Implementation Strategy

The implementation strategy is the last step of the planning process and involves prioritizing the mitigation actions developed by the Coshocton County planning group. This was done by voting. Ballots listing the mitigation actions were given to attendees at a public meeting on March 23, 2004. Each attendee was given 10 votes to distribute amongst the mitigation actions, and the ballots were then tabulated.

The ballot tabulation showed that three mitigation actions received 14 or more votes each. Seven actions received 10 or more votes each, and 14 actions received one or more votes each. Because of this the actions have been grouped into three categories, as opposed to ranking each measure individually. The actions that received less than 10 votes were considered lower priority and therefore are not included in the implementation strategy, but are covered in Section 4 of this plan.

The actions that received 14 to19 votes are listed as "**Highest Priority**"
The actions that received 10 to 13 votes are listed as "**High Priority**"
The actions that received less than 10 votes are listed as "**Medium Priority**"

The actions presented below are listed in order of priority with the highest priority actions first. This list of actions is the result of the planning effort led by the HMPC and represents what the County and communities consider most important.

Highest Priority	**Obtain updated detailed flood studies and FIRMs**
Hazards	Floods
Objectives	Obtain updated detailed flood studies and FIRMs (including 500-year flood) for areas with the greatest potential damage and threat to residents.
Comments	Apply to FEMA for updates of the most outdated FIRMs for high-hazard areas. Also apply to FEMA for funding to undertake detailed flood studies for County's high-hazard areas to determine BFEs and a full range of flood-recurrence intervals (2, 5, 10, 25, 50 and 100-year events) for use in future refinements of the mitigation plan.
Affected Municipalities	All except Falls Creek, Lumber City, New Washington, Pine, Ramey, Troutville, Wallaceton
Responsible Organization	Floodplain manager of township or borough

Estimated Costs	$15,000 (assume 500 hours of staff time at average $30/hour)
Possible Funding Sources	Federal: HMGP, PDM
Timeline for Implementation	Initiate project within first year after this plan's adoption, finish within two years.

Highest Priority	**Identify Residents With Highest Vulnerability To Severe Weather**
Hazards	Severe weather
Actions	Identify residents with the highest relative vulnerability to the effects of severe weather and prepare implementation plan. Evaluate communities that require warning systems and storm shelters. If warranted, implement additional storm shelters and warning systems, including: • "Reverse 911" systems, • Real-time weather data for emergency management personnel, or • NOAA weather radios for vulnerable populace.
Affected Municipalities	All
Responsible Organization	Clearfield County Department of Emergency Services
Estimated Costs	$160,000 (assume 2000 hours of staff time at average $30/hour and $100,000 in equipment cost)
Possible Funding Sources	Federal: HMGP, PDM
Timeline for Implementation	Finish project within three years after this plan's adoption.

High Priority	Evaluate protection of critical facilities in high-hazard areas
Hazards	Floods
Objectives	Assess protection of existing critical structures with the highest relative vulnerability to the effects of flooding and land failure.
Comments	Develop a comprehensive approach to reducing the possibility of damage and loss of function to critical facilities. • Obtain more detailed information on each facility, including number of residents, first-floor elevations, market and/or replacement value, construction type, etc. • Prioritize the critical facilities in hazard areas to determine which have the highest relative vulnerability. • Conduct cost-benefit analysis to determine the best property and personnel protection methods to promote with the individual property owners.
Affected Municipalities	Bell, Bigler, Bloom, Bradford, Chester Hill, Clearfield, Cooper, Curwensville, DuBois, Lawrence, Morris, Pike, Sandy
Responsible Organization	Clearfield County Department of Emergency Services
Estimated Costs	$30,000 (assume 1000 hours of staff time at average $30/hour)
Possible Funding Sources:	Federal: HMGP, PDM
Timeline for Implementation	Initiate project within first year after this plan's adoption, finish within two years.

High Priority	Evaluate protection of repetitive-flood-loss assets
Hazards	Floods
Objectives	Address lack of detailed information for individual repetitive-flood-loss structures, and then determine best mitigation actions.
Comments	• Obtain more detailed information on each structure, including first-floor elevations, market and/or replacement value, construction type,

	etc. • Determine which structures have the highest relative vulnerability. • Conduct cost-benefit analysis to determine the best property protection methods to promote with the individual property owners.
Affected Municipalities	Dubois, and Boroughs of Coalport, Westover, Curwensville, Mahaffey, Clearfield and Irvona
Responsible Organization	Floodplain manager of township or borough
Estimated Costs	$15,000 (assume 500 hours of staff time at average $30/hour)
Possible Funding Sources	Federal: HMGP, PDM
Timeline for Implementation	Initiate project within first year after this plan's adoption, finish within two years.

High Priority	**Address data limitations on individual structures in 100-year floodplain**
Hazards	Floods
Objectives	Address identified data limitations regarding lack of detailed information about individual structures located in the 100-year floodplain
Comments	Obtain information for structures in the areas with the highest relative vulnerability to determine the best property-protection methods. The information to be obtained includes: • Lowest-floor elevation, • Number of stories, • Presence of a basement, and • Market and/or replacement value. Of particular importance is lowest-floor elevation for facilities storing hazardous materials and located in the 100-year floodplain.
Affected Municipalities	All except Falls Creek, Lumber City, New Washington, Pine, Ramey, Troutville, Wallaceton
Responsible Organization	Clearfield County

Estimated Costs	$60,000 (assume 2000 hours of staff time at average $30/hour)
Possible Funding Sources	Federal: HMGP, PDM
Timeline for Implementation	Initiate project within first year after this plan's adoption, finish within five years.

High Priority	**Reduce potential injury/death and damage to existing community assets from severe weather**
Hazards	Severe weather
Objectives	Identify by municipality the most-vulnerable and critical existing structures and infrastructure due to the effects of severe weather.
Comments	• Conduct qualitative evaluation process for critical facilities and infrastructure to determine relative vulnerability and gather information for subsequent refinements of this mitigation plan. • Develop action plan for reducing potential damage and loss of function at identified critical facilities and infrastructure. • Identify critical facilities with the highest relative vulnerability to the effects of power outage (i.e., hospitals, nursing homes, fire, police, rescue, and emergency management). Assess availability of backup power resources (generators) for those facilities. Upgrade backup power resources as necessary.
Affected Municipalities	All
Responsible Organization	Clearfield County Department of Emergency Services
Estimated Costs	$30,000 (assume 1000 hours of staff time at average $30/hour)
Possible Funding Sources	Federal: HMGP, PDM
Timeline for Implementation	Initiate project within second year after this plan's adoption, finish within five years.

5.2 Monitoring and Evaluation of the Plan

Monitoring, evaluation and updating of the Plan is critical to maintaining the relevance of the Plan. Ensuring effective implementation of mitigation activities paves the way for continued momentum in the planning process and gives direction for the future. This section explains who will be responsible for monitoring, evaluation and updating and what those responsibilities entail. The section also lays out the method and schedule of these activities and describes how the public will be involved on a continued basis.

The Plan needs a permanent entity to be in charge and responsible for the plan maintenance processes of monitoring, evaluation and updating. This Plan recommends creating a permanent planning group, the Clearfield County Hazard Mitigation Committee, with representation from all participating municipalities. The permanent Committee will be an outgrowth of the HMPC, and will represent citizen, municipal, business, educational, volunteer and County interests through a balanced membership. The leadership of the Committee will come from a Mitigation Coordinator, following the HMPC model, in conjunction with the County Director of Emergency Services.

The Committee will oversee the progress made on the implementation of the identified action items and update the plan, as needed, to reflect changing conditions. The Committee will therefore serve as the focal point for coordinating the countywide mitigation efforts. The proposed Hazard Mitigation Committee will meet quarterly to address all its responsibilities. It will serve in an advisory capacity to the Clearfield County Board of Commissioners and the Planning Commission.

The Committee will monitor the mitigation activities by reviewing reports from the agencies identified for implementation of the different mitigation actions. The Committee will request that the responsible agency or organization submit a semi-annual report that provides adequate information to assess the status of mitigation activities. The Committee will then provide their feedback to the individual agencies.

Evaluation of the Plan will not only include checking whether mitigation actions are implemented or not, but also assessing their degree of effectiveness. This will be done by reviewing the qualitative and quantitative benefits (or avoided losses) of the mitigation activities. These will then be compared to the goals and objectives the Plan set out to achieve. The Committee will also evaluate mitigation actions if they need to be discontinued, or modified in any way in light of new developments in the community. The progress will be documented by the Committee and submitted to the Board of Commissioners on an annual basis.

The Plan will be updated every five years, as required by the Disaster Mitigation Act, 2000, or after a disaster. The updated Plan will account for any new developments in the community or special circumstances (e.g. post-disaster). Issues that come up during monitoring and evaluation that require changes in mitigation strategies and actions will be incorporated in the Plan at this stage.

5.3 Public Involvement

The Committee will involve the public during the evaluation and update of the Plan through annual public education projects, public workshops and hearings. The public will also have access to information via newsletters, mailings and the different agencies implementing the plan. The County's website (www.Clearfieldco.org) can serve as a means of two-way communication by not only providing information about mitigation initiatives within the County, but also having feedback forms and other means for the public to express their views and comments. The Committee will incorporate the public comments in the next update of the Plan.

5.4 Updating The Plan

Throughout the hazard analysis and vulnerability assessment, descriptions of missing or inadequate data indicate some areas in which the County and municipalities can improve their ability to identify vulnerable structures. As the County and municipal governments work to increase their overall technical capacity and implement their comprehensive planning goals, they will attempt also to improve their ability to respond to identified hazard vulnerability identification and other needs. In short, the County and municipalities in subsequent versions of this plan will improve upon the hazard identification and vulnerability assessment by:

- Revamping County and municipal building permit and data collection systems to require and keep on file elevation certificates for all new construction, elevated structures, and other substantial improvements within the 100- and 500-year floodplain areas.

- Updating the tax and GIS databases with information like addresses, foundation type, construction type, and first-floor elevations for each structure. The updated plan will be better able to identify structures in need of mitigation based on first-floor elevations.

- Obtaining refined topographic contour information for the entire County which will allow better identification of steep slopes within the County.

- Incorporating existing and in-progress stormwater management plans and projects into the vulnerability assessment and mitigation strategy to be better able to connect localized flooding issues with riverine flooding issues.

These recommendations are also noted in the action plan. These improvements will produce an even more effective vulnerability assessment and mitigation plan upon revision.

Appendix A. Clearfield County Critical Facilities

Critical assets and infrastructures are systems whose incapacity or destruction would have a debilitating effect on the county; this generally includes:

- Government services (only those critical to continuity of government after a disaster; i.e., each township/borough building and the County courthouse)
- Emergency services (police, fire, hospitals/ambulance, emergency management agencies)
- Water supply treatment plants
- Wastewater treatment plants
- Transportation networks
- Telecommunications infrastructure
- Electrical power systems

Table A-1. Critical Facilities Mapped Within Hazard Zones

Facility	Municipality	Type of Facility	Floods	Land Failure
Government Bldg at 10 Main St	Bell Township	Government Bldg		
Government Bldg at 6018 Colonel Drake Hwy	Bell Township	Government Bldg		
School at 173 Clover Run Rd	Bell Township	School		
School at 5995 Fire Tower Rd	Bell Township	School	X	
Government Bldg at 2861 Main St	Bigler Township	Government Bldg		
Government Bldg at 6302 Cross Roads Blvd	Bigler Township	Government Bldg	X	
Government Bldg at 6209 Greenville Pike	Bloom Township	Government Bldg	X	
Government Bldg at 873 Viaduct Rd	Bloom Township	Government Bldg		
Fire Co at 2421 Pinetop Rd	Bradford Township	Fire Co	X	X
Government Bldg at 2289 Barrett Rd	Bradford Township	Government Bldg	X	X
Government Bldg at 244 Post Office Rd	Bradford Township	Government Bldg		
Woodland/Bigler Stp	Bradford Township	Hazmat		
School at 50 Bigler Rd	Bradford Township	School		
Helvetia	Brady Township	Dams		
Government Bldg at 3906 Shamokin Trl	Brady Township	Government Bldg		
Government Bldg at 79 Church Rd	Brady Township	Government Bldg		
School at 2672 Luthersburg Helvetia Rd	Brady Township	School		
Government Bldg at 227 Princess St	Brisbin Borough	Government Bldg		
Government Bldg at 476 Swoope St	Brisbin Borough	Government Bldg		
Fire Co at 6852 Main St	Burnside Borough	Fire Co		
School at 5239 Ridge Rd	Burnside Township	School		
Hockenberry Run Dam	Chest Township	Dams		
Government Bldg at 2406 Mcpherron Rd	Chest Township	Government Bldg		

Facility	Municipality	Type of Facility	Floods	Land Failure
Fire Co at 302 Walton St	Chester Hill Borough	Fire Co	X	
Government Bldg at 920 Walton St	Chester Hill Borough	Government Bldg	X	
School at 200 Short St	Chester Hill Borough	School		
Fire Co at 108 Cherry St	Clearfield Borough	Fire Co		
Fire Co at 628 Daisy St	Clearfield Borough	Fire Co		
Government Bldg at Market St	Clearfield Borough	Government Bldg		
Government Bldg at 1 2Nd St	Clearfield Borough	Government Bldg		
Government Bldg at 125 Market St	Clearfield Borough	Government Bldg		
Government Bldg at 138 Market St	Clearfield Borough	Government Bldg		
Government Bldg at 14 Front St	Clearfield Borough	Government Bldg		
Government Bldg at 228 Power Ave	Clearfield Borough	Government Bldg		
Government Bldg at 229 Power Ave	Clearfield Borough	Government Bldg		
Government Bldg at 508 Martin St	Clearfield Borough	Government Bldg		
Clearfield Swimming Pool	Clearfield Borough	Hazmat		
Hospital at 809 Turnpike Ave	Clearfield Borough	Hospital	X	
School at 230 2Nd St	Clearfield Borough	School		
School at 503 Market St	Clearfield Borough	School		
Fire Co at 946 Water St	Coalport Borough	Fire Co		
Government Bldg at 822 Forest St	Coalport Borough	Government Bldg		
Fire Co at 505 Firehouse Rd	Cooper Township	Fire Co		
Government Bldg at 1208 Main St	Cooper Township	Government Bldg		
Government Bldg at 131 Rolling Stone Rd	Cooper Township	Government Bldg		
Government Bldg at 3924 Kylertown Drifting Hwy	Cooper Township	Government Bldg		
Government Bldg at 4596 Winburne Munson Rd	Cooper Township	Government Bldg		
Government Bldg at 5433 Kylertown Drifting Hwy	Cooper Township	Government Bldg		
Government Bldg at 93 Rolling Stone Rd	Cooper Township	Government Bldg	X	

Facility	Municipality	Type of Facility	Floods	Land Failure
Government Bldg at 977 Maple St	Cooper Township	Government Bldg		
Cooper Township Muni Auth - Winburne Plant	Cooper Township	Hazmat		
Government Bldg at 88 Deer Haven Rd	Covington Township	Government Bldg		
Bell Of Pennsylvania	Covington Township	Hazmat		
Fire Co at Filbert St	Curwensville Borough	Fire Co		
Government Bldg at 100 Stadium Dr	Curwensville Borough	Government Bldg		
Government Bldg at 525 State St	Curwensville Borough	Government Bldg		
Government Bldg at 900 Susquehanna Ave	Curwensville Borough	Government Bldg		
Government Bldg at 996 Susquehanna Ave	Curwensville Borough	Government Bldg		
Curwensville Munc Auth Sewage	Curwensville Borough	Hazmat		
Howes Leather Co	Curwensville Borough	Hazmat		
Pike Township Mun Auth - Water Treatment	Curwensville Borough	Hazmat		
Wickett & Craig America Inc	Curwensville Borough	Hazmat		
School at 650 Beech St	Curwensville Borough	School	X	
Juniata Lake	DuBois City	Dams		
Fire Co at Park Ave	DuBois City	Fire Co		
Fire Co at 12 Main St	DuBois City	Fire Co	X	
Fire Co at 301 1St St	DuBois City	Fire Co		
Fire Co at 418 State St	DuBois City	Fire Co		
Government Bldg at Brady St	DuBois City	Government Bldg		
Government Bldg at 33 Brady St	DuBois City	Government Bldg	X	
Government Bldg at 400 Hillcrest Ave	DuBois City	Government Bldg		
Beaver Meadow Creamery Inc	DuBois City	Hazmat		
Bell Atlantic Pa	DuBois City	Hazmat		
Dubois Sewage Treatment Plant	DuBois City	Hazmat		
Dubois Water Treatment Plant	DuBois City	Hazmat		

Facility	Municipality	Type of Facility	Floods	Land Failure
Rescar Inc	DuBois City	Hazmat		
Riverside Distribution Center	DuBois City	Hazmat		
Hospital at 100 Hospital Ave	DuBois City	Hospital		
Hospital at 100 Hospital Ave	DuBois City	Hospital		
Hospital at 145 Hospital Ave	DuBois City	Hospital		
School at 6Th St	DuBois City	School		
School at College Pl	DuBois City	School		
School at College Pl	DuBois City	School	X	
School at College Pl	DuBois City	School		
School at 111 Mccullough St	DuBois City	School		
School at 248 Juniata St	DuBois City	School		
School at 29 6Th St	DuBois City	School		
School at 400 Orient Ave	DuBois City	School		
School at 404 Liberty Blvd	DuBois City	School		
School at 514 Weber Ave	DuBois City	School		
School at 875 Sunflower Dr	DuBois City	School		
Fire Co at 9064 Gillingham Rd	Girard Township	Fire Co		
School at 1259 Lecontes Mills Rd	Girard Township	School		X
School at 1263 Lecontes Mills Rd	Girard Township	School		
Reliant Energy Systems	Goshen Township	Hazmat		
School at 20485 Shawville Croft Hwy	Goshen Township	School		
Government Bldg at 3395 Deer Creek Rd	Graham Township	Government Bldg		
Fire Co at 251 Main St	Grampian Borough	Fire Co		
Government Bldg at 245 Penn St	Grampian Borough	Government Bldg		
Government Bldg at 273 Main St	Grampian Borough	Government Bldg		
Janesville Dam	Gulich Township	Dams		

Facility	Municipality	Type of Facility	Floods	Land Failure
Government Bldg at 275 Spring St	Houtzdale Borough	Government Bldg		
Government Bldg at 704 Brisbin St	Houtzdale Borough	Government Bldg		
Bell Atlantic Telephone Of Pa	Houtzdale Borough	Hazmat		
Parker	Huston Township	Dams		
Fire Co at 12211 Bennetts Valley Hwy	Huston Township	Fire Co		
Government Bldg at 12336 Bennetts Valley Hwy	Huston Township	Government Bldg		
School at 201 Hoovertown Rd	Huston Township	School		
Government Bldg at 2879 Ansonville Rd	Jordan Township	Government Bldg		
Fire Co at 10 Hurxthal St	Karthaus Township	Fire Co		
Government Bldg at 367 Market St	Karthaus Township	Government Bldg		
Government Bldg at 48 Smith St	Karthaus Township	Government Bldg		
School at 138 Hurxthal St	Karthaus Township	School		
Government Bldg at 4388 Douglas Rd	Knox Township	Government Bldg		
Government Bldg at 7083 Douglas Rd	Knox Township	Government Bldg		
Moose Creek Reservoir	Lawrence Township	Dams		
Shaggers Inn Waterfowl Dam	Lawrence Township	Dams		
Fire Co at 1618 Washington Ave	Lawrence Township	Fire Co		
Fire Co at 1622 Washington Ave	Lawrence Township	Fire Co		
Fire Co at 425 Mill Rd	Lawrence Township	Fire Co		
Fire Co at 429 Mill Rd	Lawrence Township	Fire Co		
Fire Co at 86 Fire House Rd	Lawrence Township	Fire Co		
Government Bldg at 1000 Leonard St	Lawrence Township	Government Bldg		
Government Bldg at 105 Fulton St	Lawrence Township	Government Bldg		
Government Bldg at 1121 Linden St	Lawrence Township	Government Bldg		
Government Bldg at 1501 Washington Ave	Lawrence Township	Government Bldg		
Government Bldg at 1924 Daisy Street Ext	Lawrence Township	Government Bldg	X	

Facility	Municipality	Type of Facility	Floods	Land Failure
Government Bldg at 230 Hammermill Rd	Lawrence Township	Government Bldg	X	
Government Bldg at 45 George St	Lawrence Township	Government Bldg		
Government Bldg at 650 Leonard St	Lawrence Township	Government Bldg		
Government Bldg at 652 Coal Hill Rd	Lawrence Township	Government Bldg		
Government Bldg at 735 Beauty Dr	Lawrence Township	Government Bldg		
Government Bldg at 911 Leonard St	Lawrence Township	Government Bldg		
Clearfield Municipal Authority Sewage Plant	Lawrence Township	Hazmat		X
Clearfield Water Treatment Plant	Lawrence Township	Hazmat		X
School at 119 Byers St	Lawrence Township	School		
School at 123 Byers St	Lawrence Township	School	X	
School at 125 Byers St	Lawrence Township	School	X	
School at 18 Race St	Lawrence Township	School		
School at 2831 Washington Ave	Lawrence Township	School	X	
School at 438 River Rd	Lawrence Township	School	X	
School at 56 Alliance Rd	Lawrence Township	School	X	
School at 6264 Clearfield Woodland Hwy	Lawrence Township	School	X	
School at 700 High Level Rd	Lawrence Township	School		
School at 94 Alliance Rd	Lawrence Township	School		
Government Bldg at 240 Grandview Rd	Lumber City Borough	Government Bldg		
Morrisdale Mine	Morris Township	Dams		X
Fire Co at 72 Glendale Ave	Morris Township	Fire Co		
Government Bldg at 1104 Deer Creek Rd	Morris Township	Government Bldg		
Government Bldg at 1189 Oak Grove Rd	Morris Township	Government Bldg	X	
Government Bldg at 52 Church St	Morris Township	Government Bldg		
Government Bldg at 5695 Morrisdale Allport Hwy	Morris Township	Government Bldg		
Government Bldg at 5719 Morrisdale Allport Hwy	Morris Township	Government Bldg		

Facility	Municipality	Type of Facility	Floods	Land Failure
Police at 1183 Oak Grove Rd	Morris Township	Police		
School at 356 Allport Cutoff	Morris Township	School		
School at 516 Allport Cutoff	Morris Township	School		
School at 524 Allport Cutoff	Morris Township	School		
Government Bldg at 58 Front St	New Washington Borough	Government Bldg		
Fire Co at 140 Curtin St	Osceola Mills Borough	Fire Co		
Fire Co at 513 Lingle St	Osceola Mills Borough	Fire Co		
School at 700 Blanchard St	Osceola Mills Borough	School		
Government Bldg at 1265 Stronach Rd	Penn Township	Government Bldg		
Government Bldg at 825 Stronach Rd	Penn Township	Government Bldg		
School at 178 Walltown Rd	Penn Township	School		
Curwensville Dam	Pike Township	Dams		
Montgomery	Pike Township	Dams		
Pike Township	Pike Township	Dams		
Government Bldg at 12903 Curwensville Tyrone Hwy	Pike Township	Government Bldg	X	
Government Bldg at 1548 114Th Calvary Rd	Pike Township	Government Bldg		
Government Bldg at 1579 114Th Calvary Rd	Pike Township	Government Bldg		
Government Bldg at 326 Water Plant Rd	Pike Township	Government Bldg		
Government Bldg at 86 Little Clearfield Creek Rd	Pike Township	Government Bldg		
Government Bldg at 10462 Rockton Mountain Hwy	Pine Township	Government Bldg		
Galion Bay	Sandy Township	Dams		
Gravel Lick	Sandy Township	Dams		
Lake Rene	Sandy Township	Dams		
Lake Sabula	Sandy Township	Dams		
Little Flipper Lake Dam	Sandy Township	Dams		
Wolf Creek	Sandy Township	Dams		

Facility	Municipality	Type of Facility	Floods	Land Failure
Fire Co at 5129 Bee Line Hwy	Sandy Township	Fire Co		
Fire Co at 83 Guy Ave	Sandy Township	Fire Co		
Government Bldg at 1094 Chestnut Ave	Sandy Township	Government Bldg		
Sears Parts & Service	Sandy Township	Hazmat	X	
Total Environmental Solutions - Well 12	Sandy Township	Hazmat		
Total Environmental Solutions - Well 14	Sandy Township	Hazmat	X	
Total Environmental Solutions - Well 23	Sandy Township	Hazmat		
Total Environmental Solutions - Well 32	Sandy Township	Hazmat		
Total Environmental Solutions - Well 4	Sandy Township	Hazmat		
Total Environmental Solutions - Well Stp	Sandy Township	Hazmat		
School at 1032 Chestnut Ave	Sandy Township	School		
School at 201 Eastern Ave	Sandy Township	School		
School at 23 Kelly Ct	Sandy Township	School		
School at 300 Wasson Ave	Sandy Township	School		
School at 4153 Liberty Rd	Sandy Township	School		
School at 493 Highland St	Sandy Township	School		
School at 67 Haines Rd	Sandy Township	School		
Government Bldg at 164 Main St	Troutville Borough	Government Bldg		
School at 114 Walnut St	Troutville Borough	School		
Dubois Reservoir	Union Township	Dams		
Government Bldg at 1504 Continental Dr	Union Township	Government Bldg		
Government Bldg at 1558 Home Camp Rd	Union Township	Government Bldg		
Government Bldg at 21 Old Dubois Rd	Union Township	Government Bldg		
Government Bldg at 3011 Luthersburg Rockton Rd	Union Township	Government Bldg		
Government Bldg at 1914 Hilltop Rd	Wallaceton Borough	Government Bldg		
Government Bldg at 445 Clearfield St	Wallaceton Borough	Government Bldg		

Facility	Municipality	Type of Facility	Floods	Land Failure
Government Bldg at 456 Old Route 322	Wallaceton Borough	Government Bldg		
School at 264 Wilson St	Wallaceton Borough	School		
Fire Co at 583 Bridge St	Westover Borough	Fire Co		
Government Bldg at 6301 Green Acre Rd	Woodward Township	Government Bldg		
Houtzdale Munc. - Sandborn Water Pump	Woodward Township	Hazmat		
Houtzdale Stp - Sterling	Woodward Township	Hazmat		
Houtzdale Water Treatment - Whiteside	Woodward Township	Hazmat		
Woodward Twp Stp - Whiteside	Woodward Township	Hazmat		
		Totals	25	6

Flood Loss Calculations for Clearfield County

			Structure Loss			Contents Loss			Structure Use & Function Loss				
No. of Structures	Type of Structure	Depth of Flooding, ft	Structure Relacement Value	Percent Damage	Structure Loss	Contents Relacement Value	Percent Damage	Contents Loss	Avg Daily Operating Budget	Functional Dowtime, days	Displ. Cost per Day	Displ. Time, days	Structure Use & Function Loss
35	One Story No Basement	0-1	$2,320,405	14	$324,857	$580,101	21	$121,821	$5,250	14	$15,400	62	$1,028,300
21		1-2	$1,830,350	22	$402,677	$457,588	33	$151,004	$3,188	22	$9,350	126	$1,248,225
10		2-3	$1,965,673	27	$530,732	$491,418	40.5	$199,024	$1,538	27	$4,510	166	$790,173
14		3-4	$436,613	29	$126,618	$109,153	43.5	$47,482	$2,100	29	$6,160	182	$1,182,020
15		4-5	$487,250	30	$146,175	$121,813	45	$54,816	$2,175	30	$6,380	190	$1,277,450
7		5-6	$281,850	40	$112,740	$70,463	60	$42,278	$1,013	30	$2,970	270	$832,275
12		6-7	$953,125	43	$409,844	$238,281	64.5	$153,691	$1,725	30	$5,060	294	$1,539,390
10		7-8	$468,400	44	$206,096	$117,100	66	$77,286	$1,425	30	$4,180	302	$1,305,110
129		>8	$17,036,634	45	$7,666,485	$4,259,158	67.5	$2,874,932	$19,350	30	$56,760	310	$18,176,100
35	Two Story No Basement	0-1	$2,320,405	9	$208,836	$580,101	13.5	$78,314	$5,250	9	$15,400	0	$47,250
21		1-2	$1,830,350	13	$237,946	$457,588	19.5	$89,230	$3,188	13	$9,350	54	$546,338
10		2-3	$1,965,673	18	$353,821	$491,418	27	$132,683	$1,538	18	$4,510	94	$451,615
14		3-4	$436,613	20	$87,323	$109,153	30	$32,746	$2,100	20	$6,160	110	$719,600
15		4-5	$487,250	22	$107,195	$121,813	33	$40,198	$2,175	22	$6,380	126	$851,730
7		5-6	$281,850	24	$67,644	$70,463	36	$25,367	$1,013	24	$2,970	142	$446,040
12		6-7	$953,125	26	$247,813	$238,281	39	$92,930	$1,725	26	$5,060	158	$844,330
10		7-8	$468,400	29	$135,836	$117,100	43.5	$50,939	$1,425	29	$4,180	182	$802,085
129		>8	$17,036,634	33	$5,622,089	$4,259,158	49.5	$2,108,283	$19,350	30	$56,760	214	$12,727,140
23	One or Two Story With Basement	-3 to -2	$773,153	4	$30,926	$193,288	6	$11,597	$3,375	4	$9,900	0	$13,500
18		-2 to -1	$2,507,594	8	$200,607	$626,898	12	$75,228	$2,625	8	$7,700	0	$21,000
22		-1 to 0	$3,856,795	11	$424,247	$964,199	16.5	$159,093	$3,225	11	$9,460	38	$394,955
70		0-1	$4,640,810	15	$696,122	$1,160,203	22.5	$261,046	$10,500	15	$30,800	70	$2,313,500
43		1-2	$3,660,700	20	$732,140	$915,175	30	$274,553	$6,375	20	$18,700	110	$2,184,500
21		2-3	$3,931,345	23	$904,209	$982,836	34.5	$339,079	$3,075	23	$9,020	134	$1,279,405
28		3-4	$873,225	28	$244,503	$218,306	42	$91,689	$4,200	28	$12,320	174	$2,261,280
29		4-5	$974,500	33	$321,585	$243,625	49.5	$120,594	$4,350	30	$12,760	214	$2,861,140
14		5-6	$563,700	38	$214,206	$140,925	57	$80,327	$2,025	30	$5,940	254	$1,569,510
23		6-7	$1,906,250	44	$838,750	$476,563	66	$314,531	$3,450	30	$10,120	302	$3,159,740
19		7-8	$936,800	49	$459,032	$234,200	73.5	$172,137	$2,850	30	$8,360	342	$2,944,620
258		>8	$34,073,267	51	$17,377,366	$8,518,317	76.5	$6,516,512	$38,700	30	$113,520	365	$42,595,800
					$39,438,419			$14,789,407					$106,414,120

Source: FEMA publication 386-2, "Understanding Your Risks"

TOTAL **$160,641,946**

Assumptions for Flood Loss Calculations

Structure replacement value assumed as improved market value	
Contents replacement value assumed at 25% of structure replacement value	
Average daily operating budget (residence):	$0
Displacement cost per day (residence):	$100
Average daily operating budget (commercial/agriculture):	$1,000
Displacement cost per day (commercial/agriculture):	$500

Assume 50% of structures have basement, 25% each are 1 and 2-story/no basement

Assume 15% of structures are commercial/agriculture, 90% are residential

Appendix C. Alternative Mitigation Actions

Alternative Flood Mitigation Actions

In Clearfield County, flooding is caused by development in naturally occurring floodplains, therefore the following discussion of alternative flood hazard mitigation actions presents different possible property protection actions that can be taken to mitigate hazards and evaluates their feasibility based on characteristics of the flood hazard, characteristics of the affected structures, and accepted uses of the action.

There are several different categories of flood hazard mitigation measures possible for the neighborhood and structures within the flood hazard areas. The following mitigation measures were considered when deriving recommendations.

Acquisition

Acquisition involves the municipal government purchasing and demolishing or moving (referred to as **relocation**) structures in the floodplain. The land is permanently deed-restricted for open spaces uses in order to restore the natural and beneficial functions of the floodplain. Structures that have been repetitively flooded, or experience floods with high flood depths, velocities greater than five feet per second, or long duration tend to be the best candidates for acquisition. Acquisition is considered to be one of the most effective flood mitigation measures because it entirely removes structures from the pathway of floods.

Acquisition is an effective mitigation measure, but can be damaging to intact neighborhoods. It is cost-effective for structures with high flood vulnerability, however, the process of obtaining the homeowner's approval, managing the implementation of the project, and accessing funding to complete the project are sometimes difficult. After obtaining the elevations of structures in the hazard areas, municipalities and the County will have to further consider the appropriateness of acquisition as a strategy based on considerations listed in the table below.

Table C.1. Additional Considerations for the Acquisition Option

Historic Property?	Historic properties are community assets which should be saved if possible. Further investigation into other options should be made. See the historic property matrix below.
Attached/Semi-Detached Housing or other Closely	Acquiring one attached or semi-detached structure while leaving the other should be avoided. Attempt to

spaced structure?	acquire all at risk properties or find other alternative.
Adjacent to Open Space? Will It Leave A "Hole" In Neighborhood/Streetscape?	This criterion is related to the previous criterion. Acquiring a patchwork of homes is undesirable without a long-term plan to acquire a cohesive block of structures. Acquiring structures that are adjacent to open space is the preferred mitigation option.
In Poor Condition?	Structures that are in poor condition are also more suitable for acquisition and demolition.
County or Municipality Able to Maintain the Property?	When structures are acquired using federal funding, the jurisdiction acquiring the property is required to maintain the property as open space in perpetuity. The jurisdiction acquiring the parcel must decide whether to maintain it as a greenway/park or allow it to revert back to natural area or to be maintained by other residents.

Barriers

Barriers built of soil, called "berms", or concrete or steel, called "floodwalls" keep floodwaters from reaching a building. To be effective, earthen berms require three horizontal feet for each vertical foot. Concrete or steel floodwalls on the land of the property owner are flood barriers for properties that require only two feet or so of flood protection.

Dry Floodproofing

Dry floodproofing entails making all areas falling below the BFE impervious to water. Walls can be coated with a waterproofing compound or plastic sheeting. Openings such as doors, windows, sewer lines, and vents, are closed, either permanently or with removable shields. Dry floodproofing is appropriate for buildings on sound slab foundations that are subject to less than three feet of flooding. Most building walls and floors are not strong enough to withstand the hydrostatic pressure from more than three feet of water. However, this method does not remove the structure and its contents out of the path of floods.

Elevation

Raising a building above the BFE is the best on-site property protection method. Water flows under the building, causing little or no damage to the structure or its contents. Alternatives are to elevate on continuous foundation walls (creating an enclosed space below the building) or elevate on compacted earthen fill, which can be more costly than elevating on an open foundation or continuous foundation walls. If raised eight or more feet, the lower area can be floodproofed and used for parking or storage.

Elevation is suitable where flood depths are less than 10 feet and have low velocity (less than 5 feet per second), and in areas that are not prone to ice floes or in "off-channel areas that have minimal potential for damage from floating debris. Elevation is not suitable for areas with long-duration flooding, since accessing the structures would be difficult or unsafe in flood situations.

The most common elevation methods include:

- Elevating in place using solid walls, piles, or post foundations (see table below for more information on appropriate uses of foundation types);
- Filling in the basement and replacing the space with an elevated first floor; and
- Abandoning the first floor and building a second floor.

Factors like foundation type, soil type and bearing capacity, weight of the house and lateral forces on the house from water (and other natural hazards such as winds and earthquake), condition of house, and height of the proposed elevation above the grade affect the actual method for elevating a specific house. These methods are best determined by the property owner and engineer on a case-by-case basis. Table C.2 shows broad guidelines for selecting one elevated foundation versus another.

Table C.2. Elevation Methods Based on Existing Foundation Types and Other Conditions

Condition	Existing Foundation Type			
	Basement	Crawlspace	Slab-on-grade	Open
Poor Soil				●
House is heavy or has lateral wind/earthquake /water forces	●	●		
Flood velocity greater than 5 ft/sec				●
Recommended Foundation Type for Elevated Structure	Solid Walls	Solid Walls	Solid Walls	Piles, piers, posts

Politically and socially, elevation may be the most feasible option because it leaves neighborhoods intact, allows residential structures used primarily for water-related recreation activities like fishing and boating to remain near the water, and prevents damage from floods.

Structural Projects

Dikes, levees, dams, channelization, channel widening, stream realignment, seawalls, groins, and jetties are structures located away from the flood vulnerable structures. Structural projects have fallen out of favor as mitigation options because they tend to be expensive to build and maintain and can often increase flooding downstream or on the opposite side of the waterway. Furthermore, *FEMA's mitigation programs emphasize nonstructural measures* for mitigation of flood hazard. These projects tend to be disruptive to the environment and can fail or be overtopped in sufficiently large flood events. Politically and administratively, structural projects require additional studies, public input, and can sometimes take a long time to implement.

Wet Floodproofing

Wet floodproofing entails letting flood waters inside the structure and moving any asset like furniture or household appliances out of harm's way. Wet floodproofing avoids the problems of pressure from floodwaters presented by dry floodproofing. Wet floodproofing is usually used for basements and garages and is not used for one-story houses because the flooded areas would be the living areas.

Property Protection Decision Matrix

Mitigation measures need to be evaluated based on the flooding conditions at the site and the characteristics of the structure. The recommended mitigation measures described in *Section Three* were determined in part by using the Property Protection Decision Matrix below. Structure information for analysis of appropriate mitigation measures may be collected from the Clearfield County tax assessment database. After first finding information about foundation types in the tax database, planners can use the estimated depth of flooding for each structure and the decision matrix to identify appropriate mitigation measures. Properties that are at or above BFE (other than those with basement foundations) are not considered in the following decision matrix because they are considered to be outside of the regulatory floodplain and are of low mitigation priority compared to other flood structures.

Table C.3. Property Protection Decision Matrix

First Floor Flood Depth	First Recommendation	Second Recommendation
Slab		
<2 feet	Barrier	Dry Floodproof
>2 feet	Elevate	Relocate/Acquire
<9 feet	Relocate/Acquire	Relocate/Acquire
Crawlspace		
>0 feet	Elevate	Elevate
>9 feet	Relocate/Acquire	Relocate/Acquire
Basement		
>0 feet	Elevate, fill in basement	Relocate/Acquire
>9 feet	Relocate/Acquire	Relocate/Acquire
Pier / Pilings		
>0 feet	Elevate	Elevate
>9 feet	Relocate/Acquire	Relocate/Acquire

Another important consideration in certain areas is flood mitigation for historic properties. Historic properties are assets that help define communities and should be preserved where feasible. The table below presents additional considerations about the impact of hazard mitigation alternatives on historic properties. Local officials must further consider the impact of mitigation options like acquisition and demolition or relocation on local historic resources.

Table C.4. Considerations for Historic Properties

Hazard Mitigation Alternative	Reduction of Risk	Level of Impact to Historic Properties
Acquisition & Demolition	High	High
Relocation	High	Medium – High
Elevation	Medium	Medium
Dry Floodproofing	Low – Medium	Low – Medium
Wet Floodproofing	Low	Low

Hazard Mitigation Alternative	Reduction of Risk	Level of Impact to Historic Properties
Stream Channel Improvements	Low	High (archeology)
Levees & Floodwalls	Medium	Medium

Flood Mitigation Strategy Priorities

From the following discussion, the STAPLE+E can be used to rate the options, as noted in the example table below. Methods receive a "1" or "fair" as the default rating if there are particularly notable poor or good potential consequences of the method.

Table C.5. Application of STAPLE+E Criteria

Type of Mitigation Action	Prevention	Property Protection				Emergency Services Measures	Structural Options	Natural Resource Protection	Public Information Programs
Action	Floodplain Ordinance*	Acquisition and Relocation	Elevation	Dry Floodproofing	Wet Floodproofing	Warning/Evacuation	Flood Control Projects (i.e., Dams)	Stormwater Management	Public Outreach to Homeowners
Social	2	0	2	3	3	2	1	2	2
Technical	3	3	3	1	2	0	1	1	0
Administrative	1	1	2	2	2	1	0	0	1
Political	1	1	2	2	1	2	1	1	1
Legal	1	0	2	1	1	2	1	2	3
Economic	3	1	2	2	2	2	0	1	2
Environmental	3	3	3	3	3	3	0	1	3
Totals	12	9	16	14	14	12	4	8	12

Where 0 = Poor, 1 = Fair, 2= Good, 3=Excellent
* Only applicable if no floodplain ordinance has been adopted

From this example evaluation (assuming a floodplain ordinance exists), the preferred mitigation options are in order of priority:

1. Elevation
2. Dry floodproofing (tied with wet floodproofing)
3. Public outreach (tied with warning/evacuation)
4. Acquisition/relocation
5. Stormwater management
6. Flood control projects

Alternative Severe Weather Mitigations Actions

There area a number of mitigation actions that can be used to mitigate wind and weather hazards. Unlike flooding, these hazards affect the entire County, and there is no particular geographical hazard zone that may experience wind/weather damage more than other areas within the County. Therefore, wind and weather mitigation strategies usually involves identifying actions that affect individual structures with known/assumed vulnerability, particular critical facilities, or can reach the entire County, usually through public education, improving County implementation capabilities, or strengthening regulations.

The following is a list of wind hazard mitigation strategies with information about their suitability for use in Clearfield County. These strategies are technically feasible in Clearfield County and should be used in combination with each other. Other than regulations, most of these measures should be implemented by property owners with assistance from County and municipal governments.

Regulations

Properly constructed buildings are essential to resisting the force of winds and weather to structures, since ordinary construction methods produce a house that will stand up to 110 mph tornadoes and other wind storms. Model building codes are designed using wind-speed maps (see Figure 1.4) produced by the American Society of Civil Engineers (ASCE) based on a constant probability of occurrence in different parts of the the county. These design wind speeds are high enough to resist the majority of tornadoes and other strong winds if the building is constructed properly. Building codes are also important to

preventing collapse of buildings under heavy snow loads. (Source: Natural Hazard Mitigation Insights, Institute for Business and Home Safety) Most jurisdictions within Clearfield County already have building codes in place.

Building Strengthening

Manufactured home tie-downs: Manufactured homes (or "mobile" homes) are some of the most vulnerable structures to high winds, having thin walls that cannot withstand wind pressure and wind-blown projectiles. Manufactured homes have large surface area relative to their weight, making them susceptible to overturning. Furthermore, many manufactured homes are not adequately installed. Manufactured homes properly tied down with the correct number of anchors and the correct ground anchor for the soil type can reduce the vulnerability to high wind damages. Education and inspection programs can aid upgrading units to resist anticipated wind loads.

Clearfield County has a number of manufactured home parks and structures for which tie-downs may be appropriate. Manufactured homes installed on permanent foundations, especially double-wide manufactured homes on permanent foundations, are significantly less vulnerable to wind hazards than other manufactured homes and should be considered to have lower mitigation priority. The County or concerned property-owners will have to identify which manufactured homes are in need of tie-downs.

Retrofitted tie-downs cost about $1000 to $1500 to install. For low-income property owners, this can be a significant cost, and the County and municipal governments should assist with loans and grants where possible.

Retrofits: Building retrofits like safety glass, roof bracing, structural connectors, or storm shutters are methods of strengthening existing structures. Not every structure will need such measures. Buildings that were built to modern codes should be sturdy enough to withstand most strong winds. Therefore, buildings built before codes were in place are likely more susceptible to wind and snow damage and should be considered to have greater mitigation priority than those built to code. The County tax assessment database can be used to identify buildings built before municipalities used codes.

Landscaping

Structures, especially their roofs, can be protected by creating buffer spaces around buildings. Simply by pruning back overhanging or dead branches from trees, property owners can prevent damage to their property from falling limbs during strong winds.

On the other hand, planting tall trees on usually northern exposures serves as windbreak to strong winds, snow, and cold weather. The typical windbreak has several components:

- Dense conifer trees to reduce wind velocity;
- Tall broadleaf or conifer trees to extend the area of protection; and
- Low shrubs to trap snow, provide wildlife habitat and/or provide aesthetic value.

A "living snow fence" can be created with a windbreak with a density of 70 – 80 percent of multiple rows of dense conifer trees. A "field windbreak" to spread snow across cropland should have a density of 25 to 35 percent with one or two rows of mixed broadleaf or pine trees. Most farmstead or livestock windbreaks can be achieved with a density of 40 to 60 percent by planting multiple rows of conifer and broadleaf trees. The most effective protection is obtained by orienting windbreaks perpendicular to the prevailing wind. Windbreaks designed for winter protection are generally located north and west of farmsteads, livestock concentration areas, working facilities or other areas to be protected. Although often overlooked, protection from northeast storms should be considered when designing a windbreak (Source: NebGuide, Cooperative Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln, http://www.ianr.unl.edu/pubs/forestry/g1304.htm) Also, planting evergreen trees and shrubs as windbreaks can reduce winter heating costs. (Source: EPA, http://www.epa.gov/reg3esd1/garden/heat.htm)

Because most structures can benefit from simple attention to landscaping and vegetation matters, mitigation action items should focus on actions that will affect/reach all residents/properties in the County.

Warning Systems

Warning system like sirens can be used to alert residents when tornadoes or other hazards threaten vulnerable areas. Manufactured home parks (both for permanent residents and recreational/camping sites) are especially vulnerable to severe storms and residents may need the extra time to reach adequate shelter that sirens or NOAA weather radios may provide.

Sheltering

For extreme wind events like tornadoes and hurricanes, mitigation measures center on protecting residents from the storm. This is an especially important objective for manufactured housing since ordinary, in-house protection measures like basements or in-house safe rooms are not available. For manufactured home parks, community shelters

can help protect residents and visitors from severe storm events. A community shelter is defined as a shelter that is designed and constructed to protect a large number of people from a natural hazard event. Community shelters include stand-alone shelters – separate buildings (i.e., not within or attached to any other building) designed to withstand high winds and the impact of windborne debris during tornadoes, hurricanes, or other extreme-wind events. Internal shelters, i.e., rooms or areas within or attached to larger buildings are designed to be structurally independent of the larger building and to provide the same wind and missile protection as a stand-alone shelter. These shelters are intended to provide protection during a short-term high-wind event (i.e., an event that lasts no more than 36 hours) such as a tornado or hurricane. They are not recovery shelters intended to provide services and housing for people whose homes have been damaged or destroyed by fires, disasters, or catastrophes.

Both stand-alone and internal community shelters may be constructed near or within school buildings, hospitals and other critical facilities, nursing homes, commercial buildings, disaster recovery shelters, and other buildings or facilities occupied by large numbers of people. Stand-alone community shelters may be constructed in neighborhoods where existing homes lack shelters. Community shelters may be intended for use by the occupants of buildings they are constructed within or near, or they may be intended for use by the residents of surrounding or nearby neighborhoods or designated areas. (Source: FEMA 361, Design and Construction Guidance for Community Shelters, http://www.fema.gov/pdf/firma/361_ch01.pdf).

Public Information And Education

Wind and weather hazards can affect the entire County, and many of the mitigation measures presented can be economically implemented by property owners, public information and education are essential to mitigating wind and weather hazards.

Alternative Land Failure Mitigation Actions

Land Modifications

Slope Reduction: The stability of a slope can be increased by regrading it or creating benches and terraces appropriately. These measures reduce the slope thus increasing its stability. The type of soil, height of fill or cut, and soil compaction are essential components of appropriate grading in land failure susceptible areas. This measure is expensive and is probably appropriate when there is more accurate information about the very steep slopes in Clearfield County where the risk is high and thus absolutely necessary to regrade them.

Construction of a Drop Zone: A drop zone can be created by cutting back the mountainside to allow for safe rock fall. This has been done in other counties by PennDOT so that rocks would not continually fall onto the road surface. Clearfield County does not have a high incidence of rockfalls, and thus this measure may not be appropriate for Clearfield County.

Acquisition/ Relocation

Structures in the identified vulnerable areas can be acquired so that they do not face any danger from rockfalls or land subsidence incidents. However, current level of information and high cost (monetary and social) of this measure does not make this measure appropriate.

Engineering Structures

A range of engineering options can be employed to keep rockfalls from causing damage to the roads and development beside it. Retaining walls, shotcrete, rock bolts, rock fencing, ditch and berm, and rock netting are some examples. These measures would be appropriate in Clearfield County for the steep slope and rockfall vulnerable areas that occur along highways and where the previous rockfalls occurred. However, site-specific visual assessment and a geologic study would be required to consider erosion, water content and vegetation types, which in turn would help to identify whether all the areas deserve mitigation, and further determine the most appropriate method to restrain the rockfalls.

Regulations

Many kinds of land use regulations are possible alternatives for the purpose of mitigating the hazard from landslides:

Zoning ordinances consist of maps accompanied by text that describe allowable and non-allowable uses in specified zones. This planning tool can be used to designate landslide hazard areas as those zoning districts that are compatible, such as open-space recreation, buffer zones, conservancy or agriculture. A slide-prone area ordinance can regulate improper debris dumping in hazardous landslide areas, which can overload the top of the slope creating unstable hillsides. They could also regulate undercutting of slopes that can create a loaded hillside, address site drainage, fills on slopes, and setbacks from the toe or head of the slope. There are few areas in Clearfield County that have a significant susceptibility to landslides, and so the above-mentioned measures may not be

worth pursuing further, considering that regulations are politically and administratively less acceptable.

Grading ordinances require developers to obtain grading permits and provide technical reports that analyze slope stability, provide surface/subsurface drainage specifications, and call for detailed designs for fill placement and excavation. Hillside development ordinances can limit the amount and type of development that may occur on hillsides by including slope density provisions, which decrease allowable development densities as slope increases, and soil overlay provisions that assign use and density based on soil characteristics in sloped areas. Considering the hazard in Clearfield County, the above-mentioned two measures are more appropriate, to be implemented to hazard areas identified as part of this plan.

Studies And Data Collection

Geotechnical reports provide a detailed analysis of soil types at a site. These reports are prepared by qualified professionals and can identify potentially unstable soils prior to implementing construction projects. This allows for the appropriate structural design to maximize slope stability. Similarly, a geological report can identify potentially unstable areas at or near the site by identifying landforms typical to different stages in the landslide process. These studies could be made mandatory under an ordinance for obtaining development permit for the hazard areas identified as part of this plan. Considering the hazard profile and vulnerability in the County, more accurate information is the most important step before actual mitigation to make the mitigation measures economically sound.

Public Awareness

Owners of existing buildings located in areas identified as vulnerable to rockfall and land subsidence should be informed of their risk. Their risk is not high but they could get geologic or geotechnical studies done to investigate the nature and condition of the rock type they are located on. The general public should be aware of possible repercussions of development on slopes.

Grant Name	Agency	Purpose	Sustainability and Hazard Mitigation Application	Contact
Emergency Management and Hazard Mitigation				
Emergency Management Performance Grants (EMPG)	Federal Emergency Management Agency (FEMA)	To encourage the development of comprehensive emergency management, including terrorism consequence management, at the State and local level and to improve emergency management planning, preparedness, mitigation, response, and recovery capabilities.	Funding provided to States, which can be used to educate people and protect lives and structures from natural and technological hazards.	Assistant Director, Administration and Resource Planning Directorate, FEMA 500 C Street, SW Washington, DC 20472 Telephone: 202.646.2965 http://www.fema.gov
Flood Mitigation Assistance Program	Federal Emergency Management Agency (FEMA)	To help States and communities plan and carry out activities designed to reduce the risk of flood damage to structures insurable under the NFIP.	The program provides planning and grants for projects that include mitigation activities that are technically feasible and cost-effective.	Assistant Director, Federal Insurance and Mitigation Administration Directorate, FEMA 500 C Street, SW Washington, DC 20472 Telephone: 202.646.2781 http://www.fema.gov/fima
Hazard Mitigation Grant Program (HMGP)	Federal Emergency Management Agency (FEMA)	To prevent future losses of lives and property due to disasters; to implement State or local hazard mitigation plans; to enable mitigation measures to be implemented during immediate recovery from a disaster; and to provide funding for previously identified mitigation measures to benefit the disaster area.	Project grants can be funded for such activities as acquisition, relocation, elevation, and improvements to facilities and properties to withstand future disasters.	Administrator, Federal Insurance and Mitigation Administration Directorate, FEMA 500 C Street, SW Washington, DC 20472 Telephone: 202.646.2781 http://www.fema.gov/fima/mitgrant.shtm

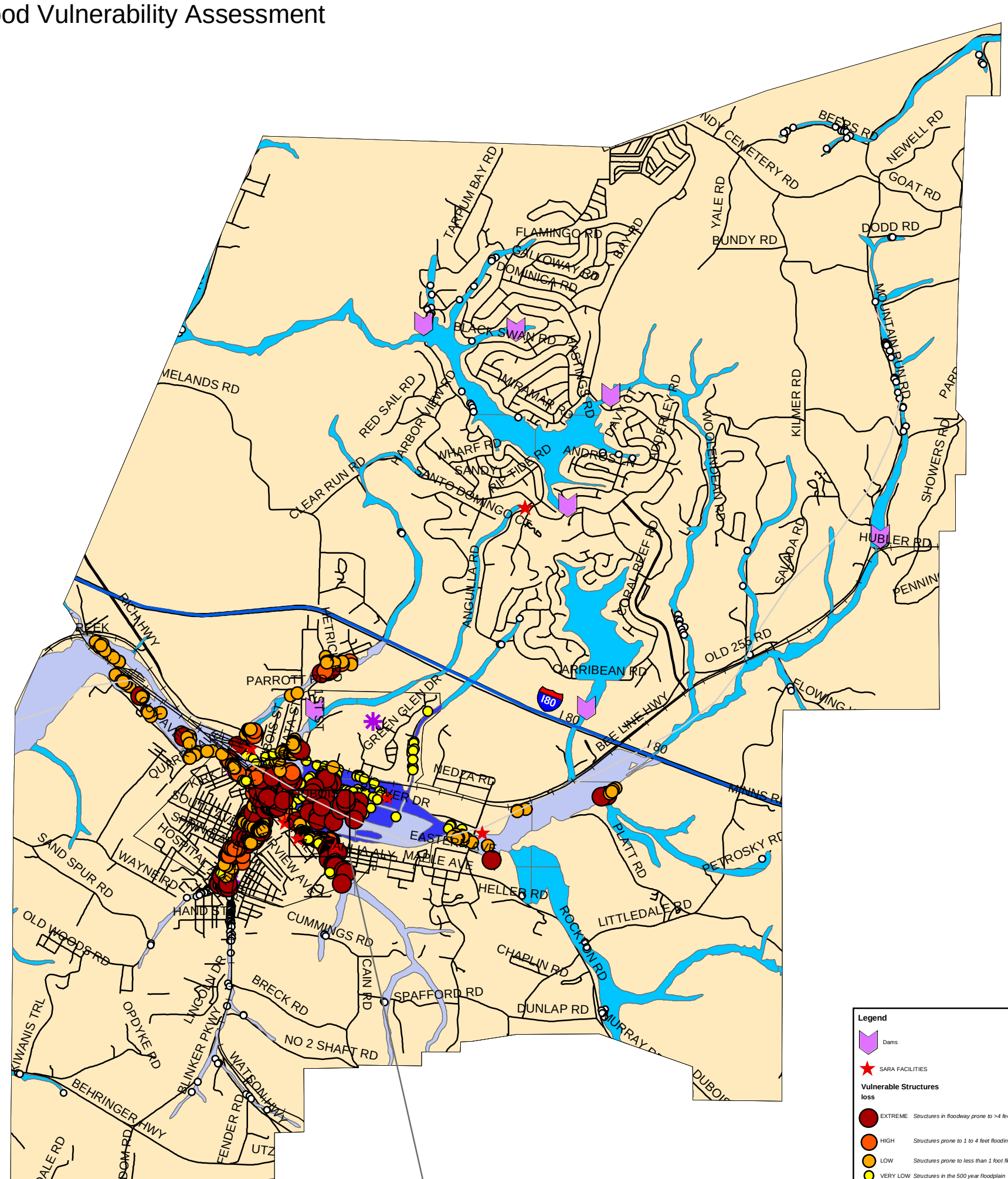
Grant Name	Agency	Purpose	Sustainability and Hazard Mitigation Application	Contact
Housing				
Community Development Block Grant (CDBG)	Department of Housing and Urban Development (HUD)	To develop viable urban communities by providing decent housing and a suitable living environment. Principally for low- to moderate-income individuals.	Community development activities that meet long-term needs. These activities can include acquisition, rehabilitation, reconstruction of properties and facilities damaged by a disaster, and redevelopment of disaster affected areas.	State and Small Cities Division, Office of Block Grant Assistance CPD, HUD 451 7th Street, SW Washington, DC 20410-7000 Telephone: 202.708.3587 http://www.hud.gov/offices/cpd/about/cpd_programs.cfm
Economic Development and Adjustment Program, Sudden and Severe Economic Dislocation (Title IX)	Department of Commerce, Economic Development Administration (EDA)	To help States and localities to develop and/or implement strategies that address adjustment problems resulting from sudden and severe economic dislocation.	Project grants can be funded in response to natural disasters including improvements and reconstruction of public faciltities.	Disaster Recovery Coordinatior Economic Adjustment Division EDA, DOC Herbert C. Hoover Building Washington, DC 20230 Telephone: 800.345.1222 or 202.482.6225 http://www.doc.gov/eda/html/prgtitle.htm
Disaster Housing Program	Federal Emergency Management Agency (FEMA)	To provide assistance to enable households to address disaster-related housing needs.	Program assistance may include 1) Short-term Lodging; 2) Home Repair Assistance to restore the home to a livable condition; 3) Rental Assistance; 4) Mortgage and Rental Assistance;. 5) Small minimization grants to incorporate hazard mitigation in home repair.	Assistant Director, Response and Recovery Directorate, FEMA 500 C Street, SW Washington, DC 20472 Telephone: 202.646.3692 http://www.fema.gov/rrr
Infrastructure				
Sustainable Development Assistance	Department of Energy (DOE), Community Services Team	The Team works with communities to help them define and implement sustainable development strategies as part of their comprehensive community planning efforts.	The Team provides technical assistance to disaster-affected communities as they plan for long-term recovery by introducing a wide array of environmental technologies and sustainable redevelopment planning practices.	DOE, Office of Energy Efficiency and Renewable Energy, Denver Regional Support Office 1617 Cole Blvd Golden, CO 80401 Telephone: 303.275.4801 http://www.sustainable.doe.gov
Flood Control Works/Emergency Rehabilitation	Department of Defense, US Army Corps of Engineers (USACE)	To assist in the repair and restoration of public works damaged by flood, extraordinary wind, wave, or water action.	The Corps provides public works and engineering support to supplement State and local efforts toward the effective and immediate response to a natural disaster.	Program Manager PL 84-99 USACE 20 Massachusetts Ave., NW Washington, DC 20314 Telephone: 202.761.0001 http://www.spd.usace.army.mil/hqpam.html

Grant Name	Agency	Purpose	Sustainability and Hazard Mitigation Application	Contact
Infrastructure (continued)				
Public Assistance Program	Federal Emergency Management Agency (FEMA)	To provide supplemental assistance to States, local governments, and certain private nonprofit organizations to alleviate suffering and hardship resulting from major disasters or emergencies declared by the President.	These grants allow State and local units of government to respond to disasters, recover from their impact and mitigate impact from future disasters.	Assistant Director, Response and Recovery Directorate, FEMA 500 C Street, SW Washington, DC 20472 Telephone: 202.646.3692 http://www.fema.gov/rrr
Transportation: Emergency Relief Program	Department of Transportation, Federal Highway Administration (FHWA)	To provide aid for repair of Federal-aid roads.	The funds can be used to repair federal-aid roads by using new technologies that improve the quality and lifespan of the roads.	Director, Office of Engineering, FHWA, DOT 400 7th Street, SW Washington, DC 20590 Telephone: 202.366.4628 http://www.fhwa.dot.gov/////progadmin/erelief.html
Water Pollution Control	Environmental Protection Agency, Office of Water	To help establish and maintain adequate measures for prevention and control of surface water and groundwater pollution.	Protecting the quality of ground and surface water today will insure the safety of water sources for future generations.	Office of Water, EPA Washington, DC 20460 Telephone: 202.260.6742 http://www.epa.gov/OW/index.html
Water and Waste Disposal Loans and Grants	Department of Agriculture, Rural Utilities Service (RUS)	To develop, replace, or repair water and waste disposal (including storm drainage) systems in rural areas and towns with a population of 10,000 or less.	Use energy-efficient pumps and incorporate mitigation measures when restoring or replacing damaged water and sewer systems.	Administrator, Water and Waste, USDA, Rural Utilities Svs. 1400 Independence Ave., SW Washington, DC 20250-3200 Telephone: 202.690.2670 http://www.usda.gov/rus/water/programs.htm
National Dam Safety Program (NDSP)	Federal Emergency Management Agency (FEMA)	To provide financial assistance incentives to States so they can strengthen their dam safety program.	Funds may be used to enhance an existing dam safety program and provide training, annual maintenance and dam inspections.	Director, National Dam Safety Program, FEMA 500 C Street, SW Washington, DC 20472 Telphone: 202.646.2704 http://www.fema.gov

Grant Name	Agency	Purpose	Sustainability and Hazard Mitigation Application	Contact
Historic Preservation				
Repair and Restoration of Disaster-Damaged Historic Properties	Federal Emergency Management Agency (FEMA)	To evaluate the effects of repairs to, restoration of, or mitigating hazards to disaster-damaged historic structures working in concert with the requirements of the Stafford Act.	Preservation of historic structures is an important link to our past. By providing assistance in mitigating future damages, historic structures can be saved for future generations to enjoy.	Assistant Director, Response and Recovery Directorate, FEMA 500 C Street, SW Washington, DC 20472 Telephone: 202.646.3692 http://www.fema.gov/nwz99/fldhisthm.htm
Historic Preservation Fund Grants-in-Aid	Department of the Interior, National Park Service (NPS)	To provide matching grants to States to expand the National Register of Historic Places, the nation's listing of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, engineering, and culture.	Grants-in-Aid are provided for the identification, evaluation, and protection of historic properties by such means as survey, planning, technical assistance, acquisition, development, and certain tax incentives available for historic properties.	USDA, NRCS, Deputy Chief for Management 14th & Independence Ave., SW Room 5110-S Washington, DC 20250 Telephone: 202.720.6297 http://www.cr.nps.gov/helpyou.htm#grant
Land Management				
Emergency Watershed Protection	Department of Agriculture, Natural Resource Conservation Services (NRCS)	To provide emergency technical and financial assistance to install or repair structures that reduce runoff and prevent soil erosion to safeguard life and property.	In preventing substantial run-off and erosion, the program helps prevent future property loss and preserves soil resources.	USDA, NRCS, Deputy Chief for Management 14th & Independence Ave., SW Room 5110-S Washington, DC 20250 Telephone: 202.720.6297 http://www.ftw.nrcs.usda.gov/pl566/EWP/ewp.htm
Coastal Zone Management Administration Awards	Department of Commerce, National Oceanic and Atmospheric Administration (NOAA)	To assist States in implementing and enhancing coastal zone management programs that have been approved by the Secretary of Commerce.	The program aids in the protection and preservation of sensitive coastal zones and provides the added benefit of reducing development in high coastal hazard areas.	Chief, Coastal Programs Division, Office of Ocean and Coastal Resource Management, National Ocean Service, NOAA, DOC 1305 East-West Highway Silver Spring, MD 20910 Telephone: 301.713.3155 http://www.ocrm.nos.noaa.gov/czm
Coastal Wetlands Planning, Protection, and Restoration Act	Department of the Interior, US Fish and Wildlife Service (USF&WS)	To grant funds to coastal States for restoration, enhancement, and management of coastal wetland ecosystems.	The program aids in the protection and preservation of sensitive coastal zones.	Chief, Division of Federal Program Activities US Fish & Wildlife Services Division of Habitat Conservation 4401 N. Fairfax Drive, Room 400 Arlington, VA 22230-1610 Telephone: 703.358.2156 http://www.fws.gov

Grant Name	Agency	Purpose	Sustainability and Hazard Mitigation Application	Contact
Land Management (continued)				
Land and Water Conservation Fund Grants	Department of the Interior, National Park Service (NPS)	To acquire and develop outdoor recreation areas and facilities for the general public, to meet current and future needs.	Project grants may be used for a wide range of outdoor recreation projects, such as picnic areas, campgrounds, tennis courts, boat launching ramps, bicycle trails, and support facilities .	Associate Director, Administrative Acting 1849 C Street, NW Washington, DC 20240 Telephone: 202.208.6953 http://wwww.doi.gov/news.states
Park and Recreation Recovery Program	Department of the Interior, National Park Service (NPS)	To provide for the rehabilitation of recreation areas and facilities, demonstration of innovative approaches to improve park system management and recreation opportunities, and development of improved recreation planning.	The program allows jurisdictions to provide recreational facilities in areas prone to natural disasters.	Associate Director, Administrative Acting 1849 C Street, NW Washington, DC 20240 Telephone: 202.208.6953 http://wwww.nps.gov/uprr
River Basin Program	Department of Agriculture, Natural Resource Conservation Services (NRCS)	To provide planning assistance to Federal, State, and local agencies for the development of coordinated water and related land resource programs.	Priority is given to projects designed to solve problems of upstream rural community flooding; water quality improvement that comes from agricultural nonpoint sources; wetland preservation; and drought management for agricultural and rural communities.	USDA, NRCS, Deputy Chief for Management 14th & Independence Ave., SW Room 5110-S Washington, DC 20250 Telephone: 202.720.6297 htttp://www.nrcs.usda.gov
Watershed Protection and Flood Prevention	Department of Agriculture, Natural Resource Conservation Services (NRCS)	To provide technical and financial assistance in planning and executing improvement projects to protect, develop, and use land and water resources in small watersheds.	Protecting watersheds enables future generations to enjoy those watershed land resources in the future.	USDA, NRCS, Deputy Chief for Management 14th & Independence Ave., SW Room 5110-S Washington, DC 20250 Telephone: 202.720.6297 htttp://www.nrcs.usda.gov/programs/ewp/factsheet.html

Du Bois and Sandy
Flood Vulnerability Assessment



LOSS ESTIMATION	NUMBER OF BUILIDNGS
EXTREME	238
HIGH	95
LOW	345
UNKNOWN	192
VERY LOW	172

BUILDING TYPE	NUMBER OF BUILDINGS
RESIDENTIAL	890
BUSINESS	145
CHURCH BLDG	1
CLINIC	1
FIRE CO	1
GROUP HOME	1
MEETING HALL	1
SCHOOL	1
WATER HOUSE	1

Legend

Dams

SARA FACILITIES

Vulnerable Structures
loss

- EXTREME — *Structures in floodway prone to >4 feet flooding*
- HIGH — *Structures prone to 1 to 4 feet flooding*
- LOW — *Structures prone to less than 1 foot flooding*
- VERY LOW — *Structures in the 500 year floodplain*
- UNKNOWN — *Structures in the floodplain where no base flood elevations were available*

RepetitiveLoss

Railroad

roads

Major Roads

Highway Class

- Interstate
- US Highway
- State Highway
- County Highway
- Off Interstate Business
- None

Q3 Floodplains

ZONE_

- A — *No base flood elevations determined*
- AE — *Base flood elevations determined*
- X500 — *Areas of the 500-year flood*

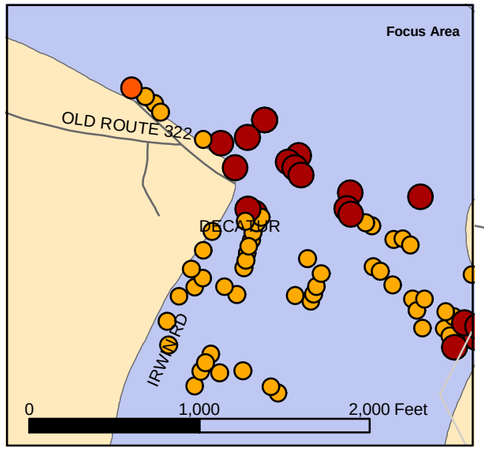
Location Map

N

Date: 05/05/2003

1 0.5 0 1 Miles

Decatur
Flood Vulnerability Assessment



Lost Estimate	Number of Buildings
EXTREME	52
HIGH	25
LOW	85
UNKNOWN	8

Building Type	Number of Buildings
RESIDENCE	116
BUSINESS	53
CHURCH BLDG	1

Legend

Dams

SARA FACILITIES

RepetitiveLoss

Vulnerable Structures

loss

- EXTREME *Structures in floodway prone to >4 feet flooding*
- HIGH *Structures prone to 1 to 4 feet flooding*
- LOW *Structures prone to less than 1 foot flooding*
- VERY LOW *Structures in the 500 year floodplain*
- UNKNOWN *Structures in the floodplain where no base flood elevations were available*
- Railroad
- roads

Major Roads

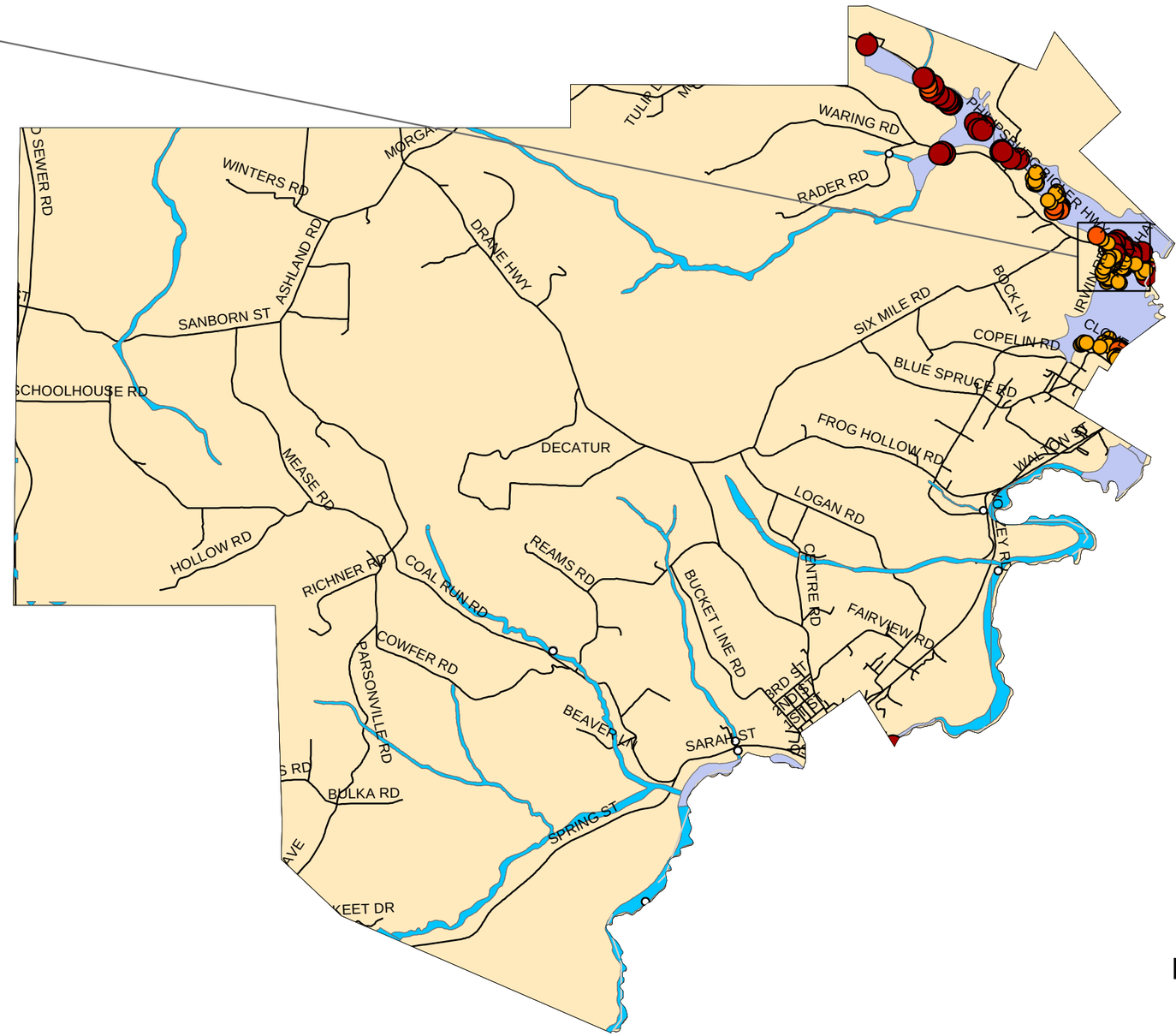
Highway Class

- Interstate
- US Highway
- State Highway
- County Highway
- Off Interstate Business
- None

Q3 Floodplains

ZONE_

- A *No base flood elevations determined*
- AE *Base flood elevations determined*
- X500 *Areas of the 500-year flood*



0 1 2 Miles

N

Location Map

URS Corporation
Created By: DMC
File: P:\Clearfield County\
52469-001 Hazard mitigation plan\
Civil\Clearfield\floodsfocus_areal.
Decatur.mxd
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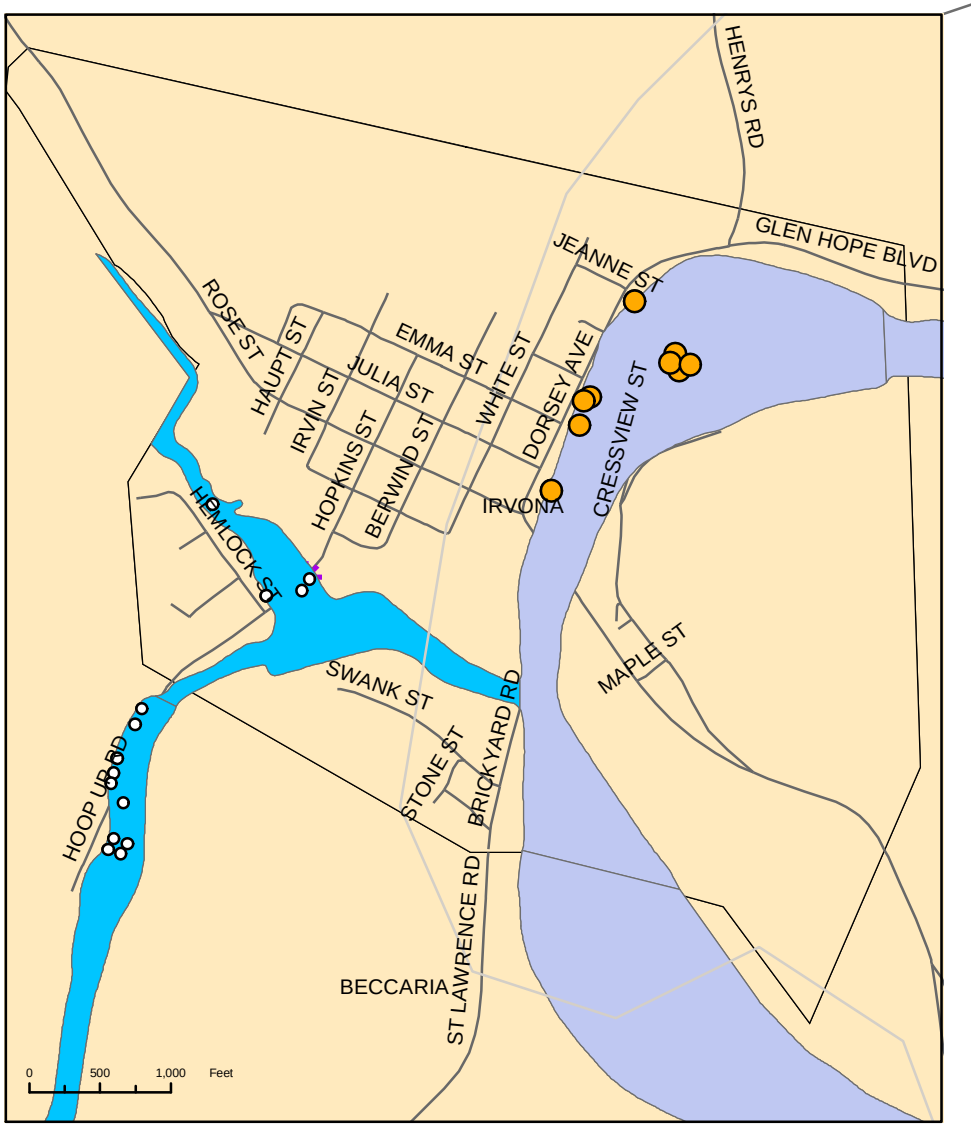
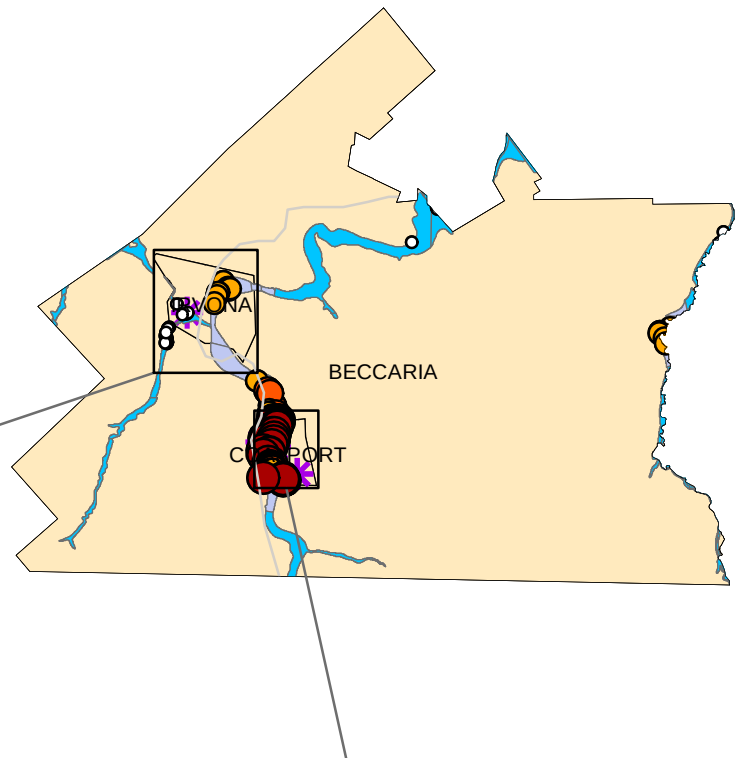
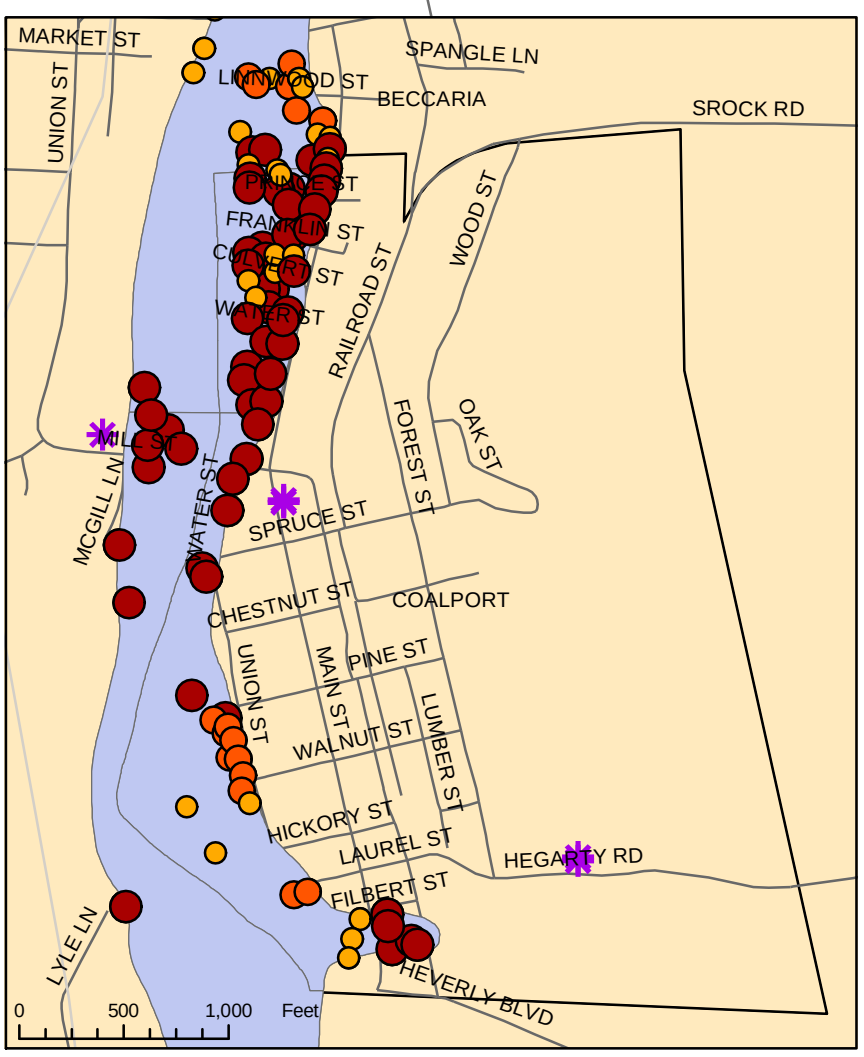
Coalport Area and Irvona
Flood Vulnerability Assessment







LOSS ESTIMATION	NUMBER OF BUILDINGS
LOW	10
UNKNOWN	4

BULIDING TYPE	NUMBER OF BUILDINGS
RESIDENTIAL	13
BUSINESS	1

LOSS ESTIMATION	NUMBER OF BUILDINGS
EXTREME	56
HIGH	16
LOW	23

BULIDING TYPE	NUMBER OF BUILDINGS
RESIDENTIAL	86
BUSINESS	6
CHURCH BLDG	2
FIRE CO	1

Legend

Dams

SARA FACILITIES

Vulnerable Structures

loss

- EXTREME — *Structures in floodway prone to >4 feet flooding*
- HIGH — *Structures prone to 1 to 4 feet flooding*
- LOW — *Structures prone to less than 1 foot flooding*
- VERY LOW — *Structures in the 500 year floodplain*
- UNKNOWN — *Structures in the floodplain where no base flood elevations were available*

RepetitiveLoss

Railroad

roads

Major Roads

Highway Class

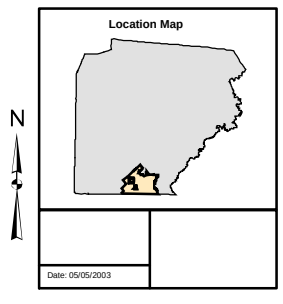
- Interstate
- US Highway
- State Highway
- County Highway
- Off Interstate Business
- None

Q3 Floodplains

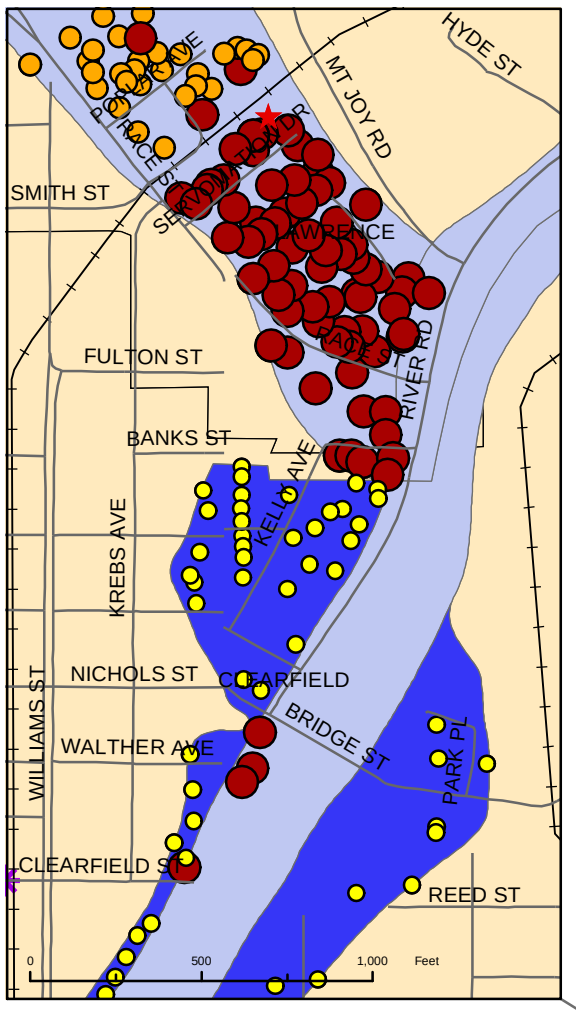
ZONE_

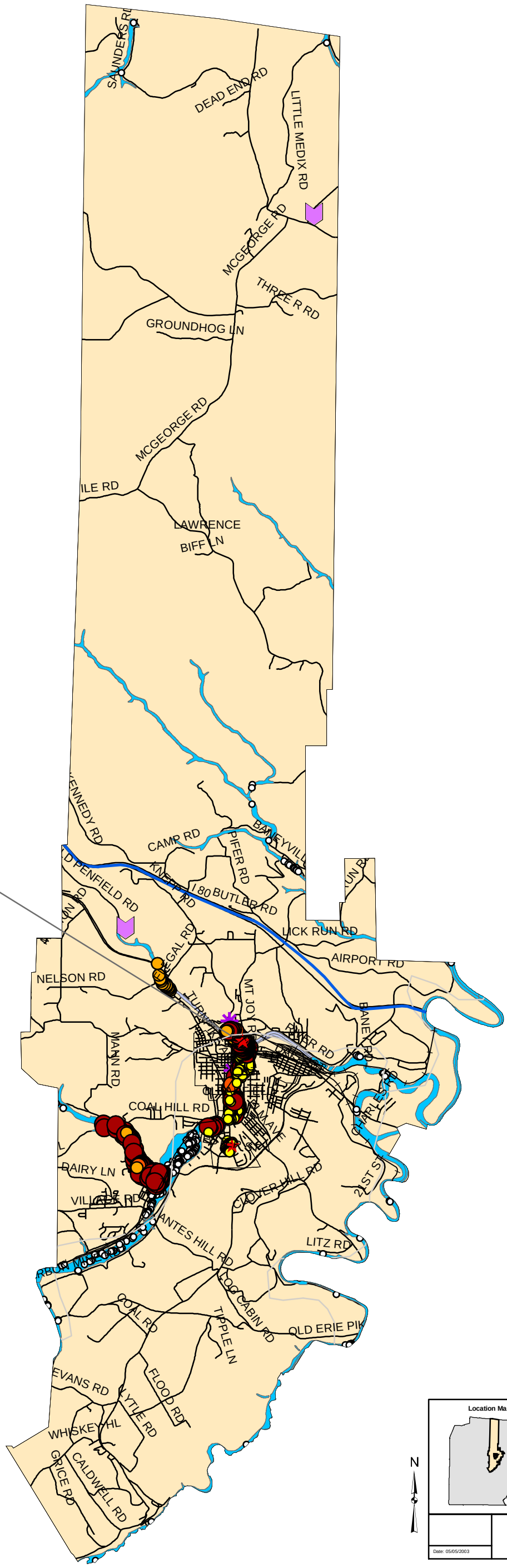
- A — *No base flood elevations determined*
- AE — *Base flood elevations determined*
- X500 — *Areas of the 500-year flood*

0.9 0.45 0 0.9 Miles



Clearfield and Lawrence
Flood Vulnerability Assessment





LOSS ESTIMATION	NUMBER OF BUILDINGS
EXTREME	304
HIGH	24
LOW	91
VERY LOW	148
UNKNOWN	222

BULIDING TYPE	NUMBER OF BUILDINGS
RESIDENTIAL	731
BUSINESS	48
CHURCH BLDG	2
FIRE CO	2
GOVERNMENT BLDG	2
SCHOOL	2
GROUP HOME	1
PUMP STATION	1

Legend

Dams

Vulnerable Structures

loss

- EXTREME — *Structures in floodway prone to >4 feet flooding*
- HIGH — *Structures prone to 1 to 4 feet flooding*
- LOW — *Structures prone to less than 1 foot flooding*
- VERY LOW — *Structures in the 500 year floodplain*
- UNKNOWN — *Structures in the floodplain where no base flood elevations were available*

RepetitiveLoss

SARA FACILITIES

Major Roads

Highway Class

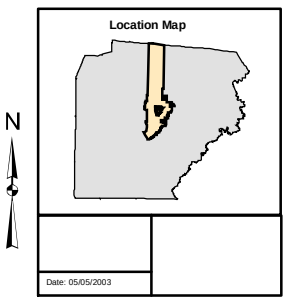
- Interstate
- US Highway
- State Highway
- County Highway
- Off Interstate Business
- None
- roads
- Railroad

Q3 Floodplains

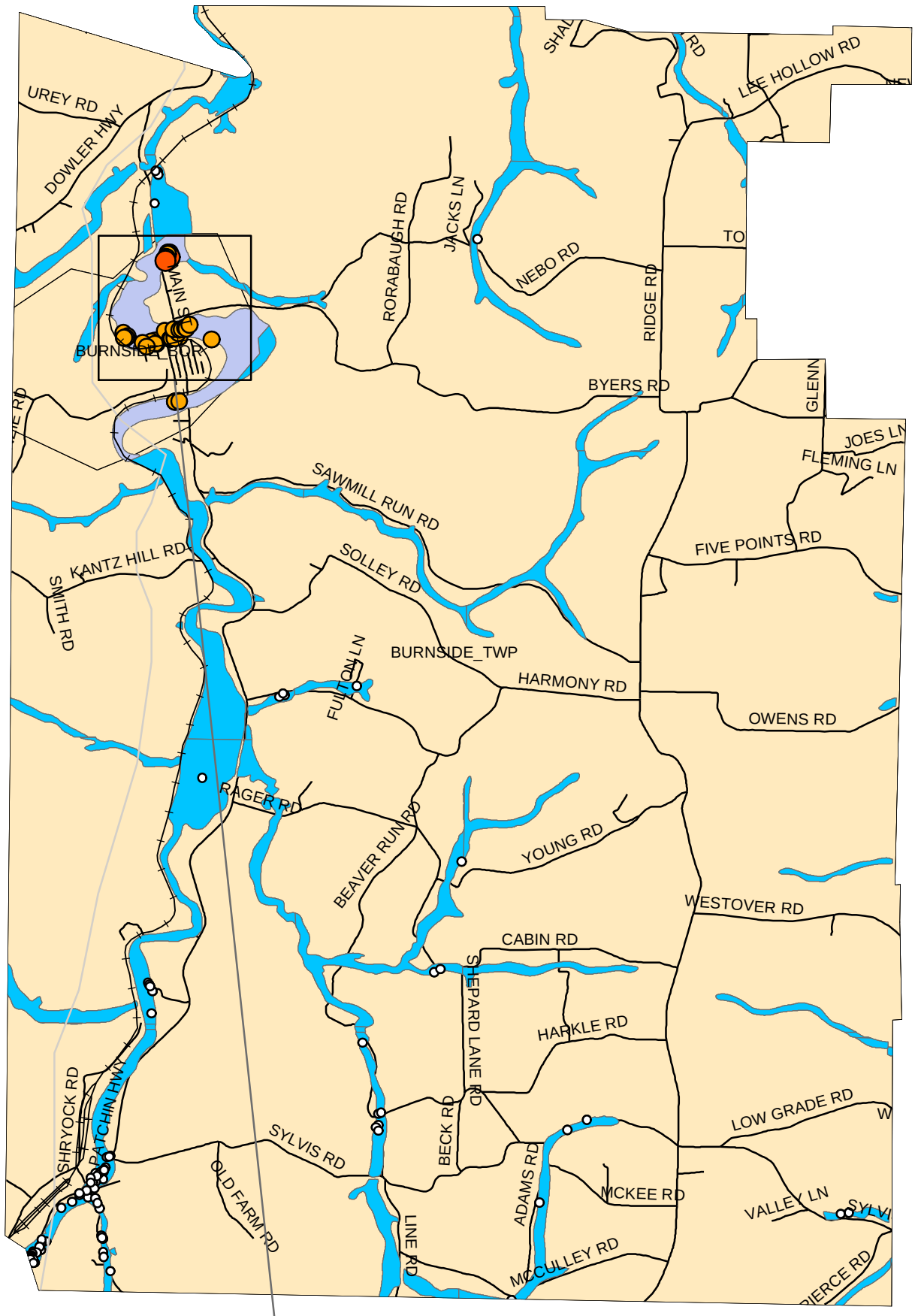
ZONE_

- A — *No base flood elevations determined*
- AE — *Base flood elevations determined*
- X500 — *Areas of the 500-year flood*

1 0.5 0 1 Miles

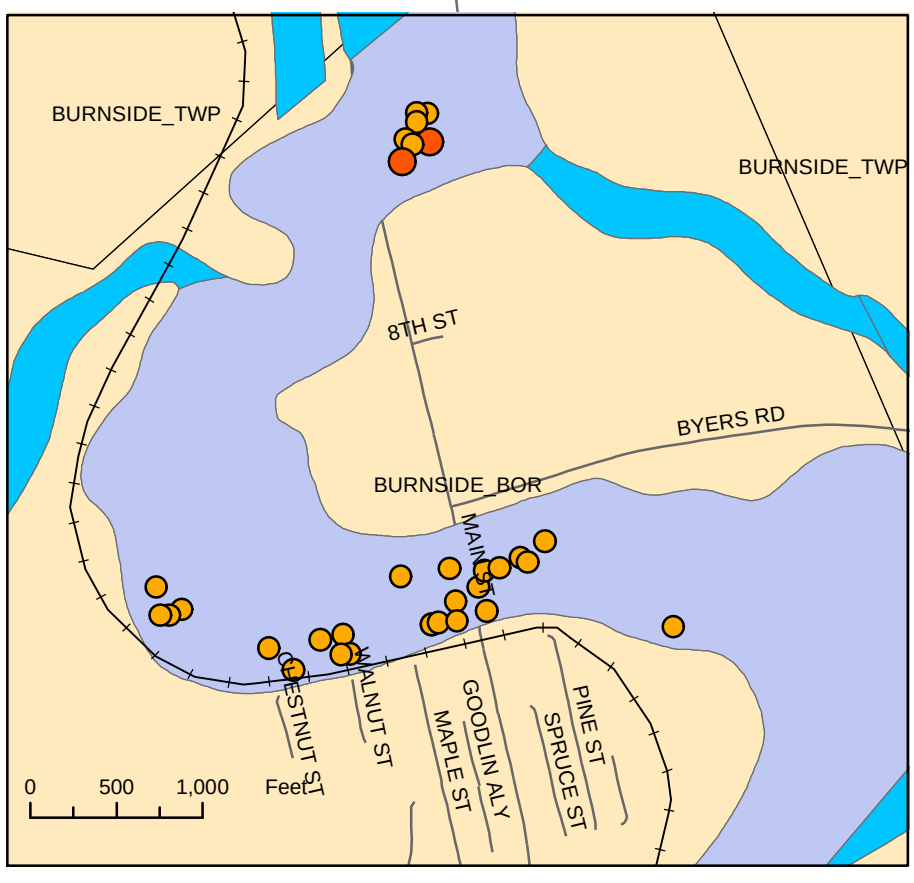


Burnside
Flood Vulnerability Assessment



LOSS ESTIMATION	NUMBER OF BUILDINGS
HIGH	2
LOW	33
UNKNOWN	91

BULIDING TYPE	NUMBER OF BUILDINGS
RESIDENTIAL	122
BUSINESS	4



Legend

- Dams
- RepetitiveLoss
- SARA FACILITIES

Vulnerable Structures

loss

- EXTREME — *Structures in floodway prone to >4 feet flooding*
- HIGH — *Structures prone to 1 to 4 feet flooding*
- LOW — *Structures prone to less than 1 foot flooding*
- VERY LOW — *Structures in the 500 year floodplain*
- UNKNOWN — *Structures in the floodplain where no base flood elevations were available*
- Railroad

Major Roads

Highway Class

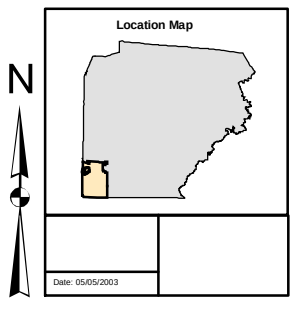
- Interstate
- US Highway
- State Highway
- County Highway
- Off Interstate Business
- None
- roads

Q3 Floodplains

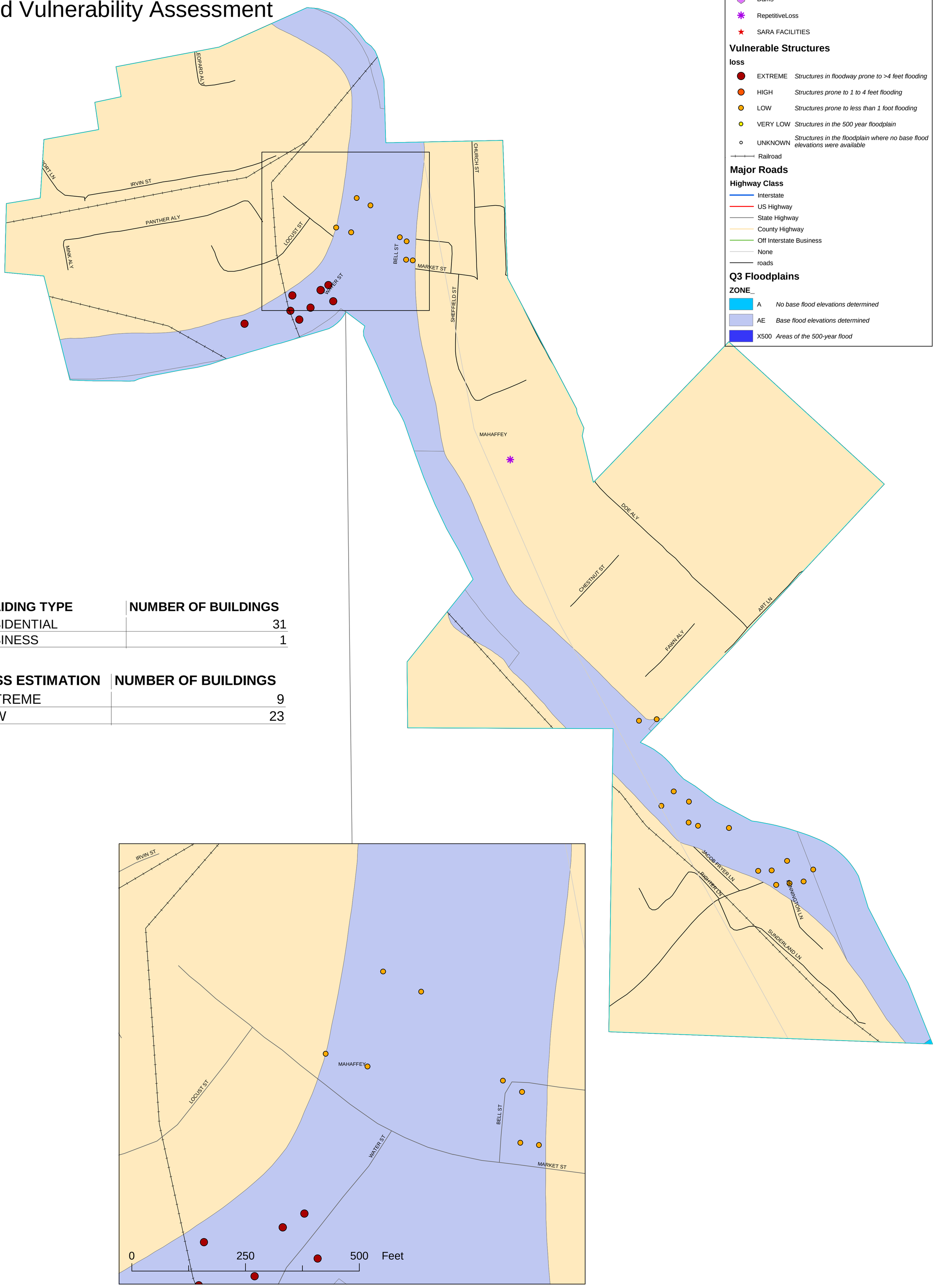
ZONE_

- A — *No base flood elevations determined*
- AE — *Base flood elevations determined*
- X500 — *Areas of the 500-year flood*

1 0.5 0 1 Miles



Mahaffey
Flood Vulnerability Assessment



Legend

- Dams
- RepetitiveLoss
- SARA FACILITIES

Vulnerable Structures

loss

EXTREME	*Structures in floodway prone to >4 feet flooding*
HIGH	*Structures prone to 1 to 4 feet flooding*
LOW	*Structures prone to less than 1 foot flooding*
VERY LOW	*Structures in the 500 year floodplain*
UNKNOWN	*Structures in the floodplain where no base flood elevations were available*

- Railroad

Major Roads

Highway Class

- Interstate
- US Highway
- State Highway
- County Highway
- Off Interstate Business
- None
- roads

Q3 Floodplains

ZONE_

A	*No base flood elevations determined*
AE	*Base flood elevations determined*
X500	*Areas of the 500-year flood*

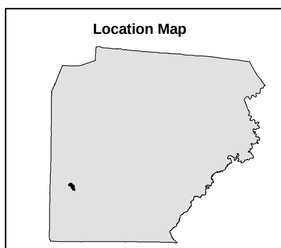
BULIDING TYPE	NUMBER OF BUILDINGS
RESIDENTIAL	31
BUSINESS	1

LOSS ESTIMATION	NUMBER OF BUILDINGS
EXTREME	9
LOW	23

0.1 0.05 0 0.1 Miles

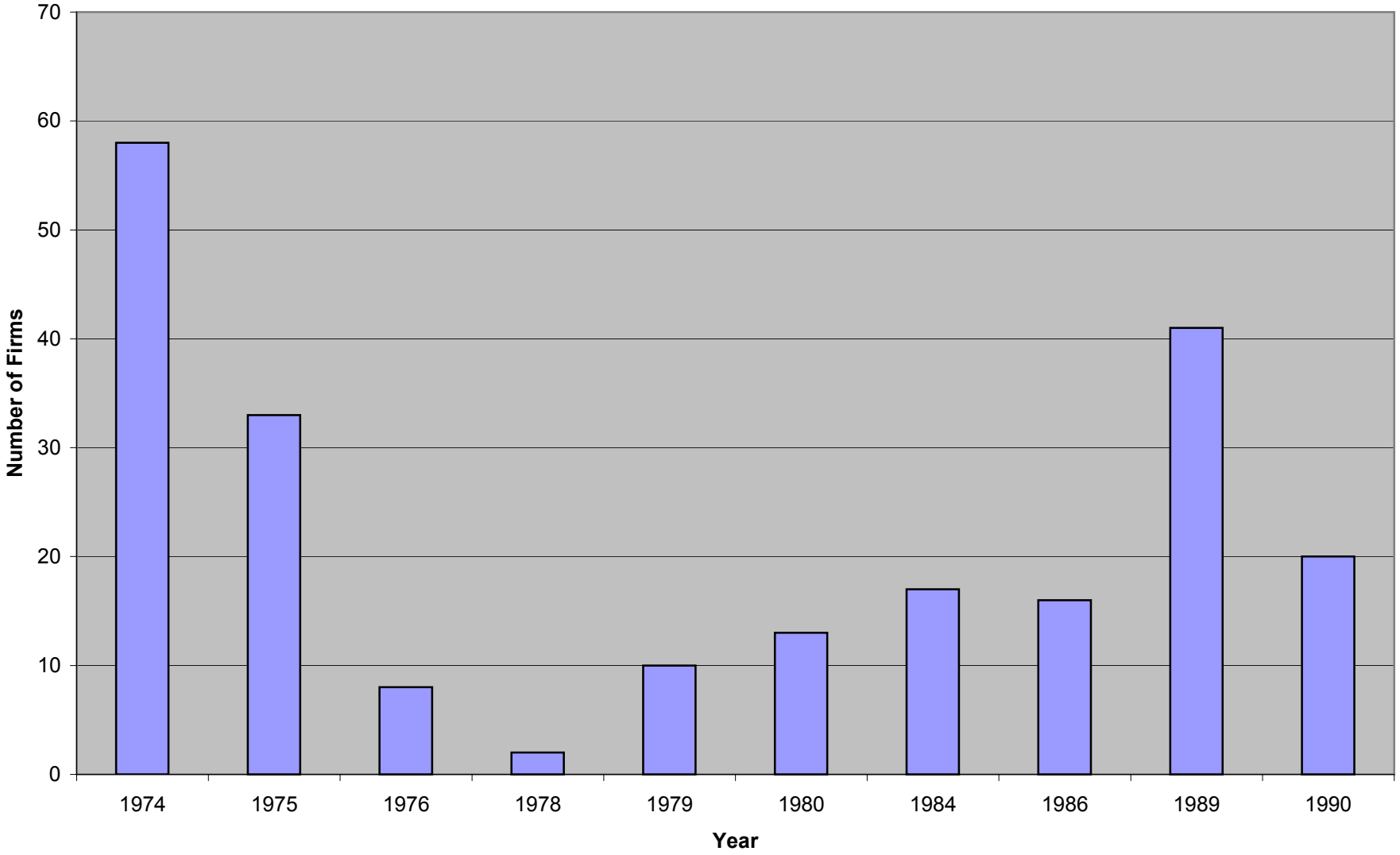
N

Location Map



Date: 05/05/2003

Clearfield County Firm Map Distribution



FIRM Date by Township/Boro

Township/Borough	Map Revised
Bigler	11/16/90
Bigler	11/16/90
Bigler	11/16/90
Chester Hill	11/2/90
Decatur	11/16/90
Decatur	11/16/90
Decatur	11/16/90
Decatur	11/16/90
Decatur	11/16/90
Gulich	11/16/90
Gulich	11/16/90
Gulich	11/16/90
Huston	1/3/90
Huston	1/3/90
Huston	1/3/90
Huston	1/3/90
Huston	1/3/90
Huston	1/3/90
Huston	1/3/90
Osceola Mills	11/16/90
Beccaria	7/4/89
Beccaria	7/4/89
Beccaria	7/4/89
Beccaria	7/4/89
Beccaria	7/4/89
Bell	8/3/89
Bell	8/3/89
Bell	8/3/89
Bell	8/3/89
Bell	8/3/89
Bell	8/3/89
Burnside	7/17/89
Coalport	7/4/89
Curwensville	7/4/89
Falls Creek	9/6/89
Grampian	7/4/89
Grampian	7/4/89
Irvona	11/3/89
Lawrence	8/3/89
Lawrence	8/3/89
Lawrence	8/3/89
Lawrence	8/3/89
Lawrence	8/3/89
Lawrence	8/3/89
Lawrence	8/3/89
Mahaffey	7/4/89
Morris	12/5/89
Penn	7/17/89
Pike	9/15/89
Pike	9/15/89
Pike	9/15/89
Pike	9/15/89

FIRM Date by Township/Boro

Township/Borough	Map Revised
Sandy	9/6/89
Sandy	9/6/89
Sandy	9/6/89
Sandy	9/6/89
Sandy	9/6/89
Sandy	9/6/89
Sandy	9/6/89
Sandy	9/6/89
Westover	8/15/89
Girard	6/17/86
Girard	6/17/86
Girard	6/17/86
Girard	6/17/86
Girard	6/17/86
Girard	6/17/86
Girard	6/17/86
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Girard	6/17/86
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Girard	6/17/86
Girard	6/17/86
Girard	6/17/86
Bloom	8/24/84
Bloom	8/24/84
Bloom	8/24/84
Bloom	8/24/84
Bloom	8/24/84
Bloom	8/24/84
Brisbin	8/13/84
Ferguson	8/3/84
Ferguson	8/3/84
Ferguson	8/3/84
Ferguson	8/3/84
Ferguson	8/3/84
Ferguson	8/3/84
Ferguson	8/3/84
Ferguson	8/3/84
Ferguson	8/3/84
Washington	8/3/84
Chest	11/14/80
Chest	11/14/80
Chest	11/14/80
Chest	11/14/80
Chest	11/14/80
Goshen	7/11/80
Goshen	7/11/80
Goshen	7/11/80
Goshen	7/11/80
Karthaus	11/14/80
Karthaus	11/14/80

FIRM Date by Township/Boro

Township/Borough	Map Revised
Karthaus	11/14/80
Karthaus	11/14/80
Clearfield	9/5/79
Covington	12/14/79
Covington	12/14/79
Covington	12/14/79
Covington	12/14/79
Union	12/28/79
Union	12/28/79
Union	12/28/79
Union	12/28/79
Union	12/28/79
DuBois	12/1/78
DuBois	12/1/78
Glen Hope	6/4/76
Houtzdale	5/14/76
Knox	6/30/76
Knox	6/30/76
Knox	6/30/76
Knox	6/30/76
Knox	6/30/76
Knox	6/30/76
Burnside	1/24/75
Burnside	1/24/75
Burnside	1/24/75
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Graham	1/3/75
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Graham	1/3/75
Graham	1/3/75
Graham	1/3/75
Graham	1/3/75
Graham	1/3/75
Graham	1/3/75
Graham	1/3/75
Graham	1/3/75
Jordan	1/17/75
Jordan	1/17/75
Jordan	1/17/75
Jordan	1/17/75

FIRM Date by Township/Boro

Township/Borough	Map Revised
Jordan	1/17/75
Jordan	1/17/75
Boggs	11/15/74
Boggs	11/15/74
Boggs	11/15/74
Boggs	11/15/74
Bradford	12/6/74
Bradford	12/6/74
Bradford	12/6/74
Bradford	12/6/74
Bradford	12/6/74
Bradford	12/6/74
Bradford	12/6/74
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Cooper	12/20/74
Cooper	12/20/74
Cooper	12/20/74
Cooper	12/20/74
Cooper	12/20/74
Cooper	12/20/74
Newburg	11/29/74
Newburg	11/29/74
Newburg	11/29/74
Newburg	11/29/74
Woodward	12/27/74
Woodward	12/27/74
Woodward	12/27/74

FIRM Date by Township/Boro

Township/Borough	Map Revised
Woodward	12/27/74
Woodward	12/27/74
Woodward	12/27/74
Woodward	12/27/74
Woodward	12/27/74
Woodward	12/27/74
Woodward	12/27/74

Count of Year	
Year	Total
1974	58
1975	33
1976	8
1978	2
1979	10
1980	13
1984	17
1986	16
1989	41
1990	20
Grand Total	218

Appendix G. Future Development Trends

Identifying areas of future development within the hazard areas provides the County and municipalities a tool to help determine whether additional land use or zoning regulations should be put in place to prevent development in hazardous areas. The following table shows the number of vacant parcels in hazard areas that can be developed in the County.

Municipality	Floods[1]	Land Failure
Beccaria	99	249
Bell	132	298
Bigler	205	208
Bloom	29	34
Boggs	46	113
Bradford	180	225
Brady	149	169
Brisbin	27	7
Burnside Boro	29	15
Burnside Twp	138	217
Chest	74	182
Chester Hill	22	4
Clearfield	15	52
Coalport	42	27
Cooper	93	47
Covington	53	58
Curwensville	61	95
Decatur	155	69
DuBois	216	34
Falls Creek	0	0
Ferguson	123	146
Girard	147	76
Glen Hope	10	11
Goshen	40	103
Graham	103	19
Grampian	28	5
Greenwood	106	167
Gulich	57	42
Houtzdale	9	5
Huston	227	329
Irvona	31	49
Jordan	80	99

[1] Only includes 100-year floodplain.

Municipality	Floods[1]	Land Failure
Karthaus	105	151
Knox	27	174
Lawrence	260	547
Lumber City	0	21
Mahaffey	17	2
Morris	132	17
New Washington	0	9
Newburg	27	24
Osceola Mills	13	0
Penn	47	151
Pike	85	255
Pine	0	6
Ramey	0	1
Sandy	665	1983
Troutville	0	0
Union	69	112
Wallaceton	0	0
Westover	39	19
Woodward	130	41
Total	**4,342**	**6,667**

LOCAL MITIGATION PLAN PROFILE
PENNSYLVANIA/FEMA REGION III

Point of Contact: Melanie Voris	**Date of Submission to State:**	
Title: Deputy Director, Department of Emergency Services		
Agency: Clearfield County DES	**NFIP Status (Single Jurisdiction)**	
Phone Number: 814-765-5357	Participating ☐	Non-Participating ☐

Multi-jurisdiction: ☒ YES ☐ NO (If yes, list each jurisdiction below:)	**N/A***	**NFIP Status (for mapped communities)**	
1. Beccaria Township	☐	Participating ☒	Non-Participating ☐
2. Bell Township	☐	Participating ☒	Non-Participating ☐
3. Bradford Township	☐	Participating ☒	Non-Participating ☐
4. Brady Township	☐	Participating ☒	Non-Participating ☐
5. Brisbin Borough	☐	Participating ☒	Non-Participating ☐
6. Chest Township	☐	Participating ☒	Non-Participating ☐
7. Chester Hill Borough	☐	Participating ☒	Non-Participating ☐
8. Clearfield Borough	☐	Participating ☒	Non-Participating ☐
9. Coalport Borough	☐	Participating ☒	Non-Participating ☐
10. Cooper Township	☐	Participating ☒	Non-Participating ☐
11. Covington Township	☐	Participating ☒	Non-Participating ☐
12. Curwensville Borough	☐	Participating ☒	Non-Participating ☐
13. DuBois (City of)	☐	Participating ☒	Non-Participating ☐
14. Falls Creek Borough	☒	Participating ☐	Non-Participating ☐

LOCAL MITIGATION PLAN PROFILE
PENNSYLVANIA/FEMA REGION III

15. Ferguson Township	☐	Participating	☒	Non-Participating	☐
16. Girard Township	☐	Participating	☒	Non-Participating	☐
17. Glen Hope Borough	☐	Participating	☒	Non-Participating	☐
18. Graham Township	☐	Participating	☒	Non-Participating	☐
19. Greenwood Township	☐	Participating	☒	Non-Participating	☐
20. Gulich Township	☐	Participating	☒	Non-Participating	☐
21. Houtzdale Borough	☐	Participating	☒	Non-Participating	☐
22. Huston Township	☐	Participating	☒	Non-Participating	☐
23. Irvona Borough	☐	Participating	☒	Non-Participating	☐
24. Karthaus Township	☐	Participating	☒	Non-Participating	☐
25. Knox Township	☐	Participating	☒	Non-Participating	☐
26. Lawrence Township	☐	Participating	☒	Non-Participating	☐
27. Lumber City Borough	☐	Participating	☒	Non-Participating	☐
28. Morris Township	☐	Participating	☒	Non-Participating	☐
29. New Washington Borough	☐	Participating	☒	Non-Participating	☐
30. Penn Township	☐	Participating	☒	Non-Participating	☐
31. Pike Township	☐	Participating	☒	Non-Participating	☐
32. Pine Township	☒	Participating	☐	Non-Participating	☐
33. Ramey Borough	☒	Participating	☐	Non-Participating	☐
34. Sandy Township	☐	Participating	☒	Non-Participating	☐
35. Union Township	☐	Participating	☒	Non-Participating	☐

LOCAL MITIGATION PLAN PROFILE
PENNSYLVANIA/FEMA REGION III

36. Wallaceton Borough	☐	Participating	☒	Non-Participating	☐
37. Westover Borough	☐	Participating	☒	Non-Participating	☐

Local Plan POC:
Please complete the information requested on this profile form. The form will be submitted with your plan to the state. Utilizing the attached crosswalk, compare your local plan content with the criteria outlined. Please note under the column heading "Page Number(s) in Plan" the page(s) where the criteria can be found in the plan being submitted for review. Thank you.

*** Not applicable for communities not mapped and/or who do not have an identified flood risk.**

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Local Mitigation Plans
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Name of Plan Clearfield County

Section from the Interim Final Rule Part 201	Requirement as taken from the Interim Final Rule	Indicate where the information is located in the Basic Plan and/or Annex and Section or Page #(s)	For further explanation and examples see Page # indicated below from the State and Local Plan Interim Criteria Under the Disaster Mitigation Act of 2000 Document	**Scoring System** Met/Not Met Unsatisfactory Needs Improvement Satisfactory Outstanding **STATE/FEMA Reviewer Comments**
Prerequisites	**NOTE: All prerequisites must be met before the plan can be approved.**		3-1 (worksheet) 4-5	
Adoption by the Local Governing Body **Requirement §201.6(c)(5)**	[The local hazard mitigation plan shall include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council)…	N/A	3-2 (worksheet) 4-5	

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Multi-Jurisdictional Plan Adoption **(Where Applicable)** **Requirement §201.6(c)(5)**	For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.	App. L	3-3 (worksheet) 4-5	
Multi-Jurisdictional Planning Participation **(Where Applicable)** **Requirement §201.6(a)(3)**	Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process… Statewide plans will not be accepted as multi-jurisdictional plans.	App. L	3-4 (worksheet) 4-5	

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Planning Process § 201.6(b)(1-3):	[…..the planning process shall include:] (1) an opportunity for public comment on the plan during drafting stage and prior to plan approval…..(2) input includes neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies having authority to regulate development including businesses, academia and other private and non-profit interests….(3) as appropriate, review and incorporate existing plans, studies, reports and technical information.		3-5 (worksheet) 4-5	

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Documentation of the Planning Process **Requirement §201.6(c)(1):**	[The plan must document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.	Pages x to xi	3-6 (worksheet) 4-5	
Risk Assessment			3-9 (worksheet) 4-5	
Identifying Hazards **Requirement §201.6(c)(2)(i):**	[The risk assessment shall include a] description of the type….of all natural hazards that can affect the jurisdiction…	Section 1	3-10 (worksheet) 4-5	

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Profiling Hazard Events **Requirement §201.6(c)(2)(i):**	[The risk assessment shall include a] description of the…location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.	Section 1	3-14 (worksheet) 4-5	

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Assessing Vulnerability: Identifying Assets **Requirement §201.6(c)(2)(ii)(A):** **(cont. on page 8)**	[The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.	Section 1	3-18 (worksheet) 4-5	

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(cont. from page 7) **Assessing Vulnerability: Identifying Assets** **Requirement §201.6(c)(2)(ii)(A):**	The plan should describe vulnerability in terms of: • The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas…	Section 1	3-18 (worksheet) 4-5	

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Assessing Vulnerability: Estimating Potential Losses **Requirement §201.6(c)(2)(ii)(B):**	[The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate…	Section 1, Appendix B	3-22 (worksheet) 4-5	
Assessing Vulnerability: Analyzing Development Trends **Requirement §201.6(c)(2)(ii)(C):**	[The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.	Section 1	3-24 (worksheet) 4-5	

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Multi-Jurisdictional Risk Assessment **Requirement §201.6(c)(2)(iii):**	For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.	Section 1	3-26 (worksheet) 4-5	
Mitigation Strategy §201.6(c)(3	The mitigation strategy is provided [**based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.**]		No Specific Guidance	

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Local Hazard Mitigation Goals **Requirement §201.6(c)(3)(i):**	[The hazard mitigation strategy shall include: a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.	Section 3	3-30 (worksheet) 4-6	
Identification and Analysis of Mitigation Measures **Requirement §201.6(c)(3)(ii):**	[The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.	Section 4	3-34 (worksheet) 4-6	

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Implementation of Mitigation Measures **Requirement §201.6(c)(3)(iii):**	[The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.	Section 5.1	3-36 (worksheet) 4-6	

FEMA Region III - Pennsylvania
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Multi-jurisdictional Mitigation Strategy **Requirement §201.6(c)(3)(iv):**	For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.	Section 5.1	3-40 (worksheet) 4-6	
Plan Maintenance Procedures			3-43 (worksheet) 4-6	
Monitoring, Evaluating, and Updating the Plan **Requirement §201.6(c)(4)(i):**	[The plan maintenance process shall include a section describing the] method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.	Section 5.2 and 5.4	3-44 (worksheet) 4-6	

FEMA Region III - Pennsylvania
Local Mitigation Plans
Part 3 Plan Review Criteria
Disaster Mitigation Act of 2000
44 CFR Parts 201 and 206; Interim Final Rule

Name of Plan Clearfield County

Section from the Interim Final Rule Part 201	Requirement as taken from the Interim Final Rule	Indicate where the information is located in the Basic Plan and/or Annex and Section or Page #(s)	For further explanation and examples see Page # indicated below from the State and Local Plan Interim Criteria Under the Disaster Mitigation Act of 2000 Document	**Scoring System** Met/Not Met Unsatisfactory Needs Improvement Satisfactory Outstanding **STATE/FEMA Reviewer Comments**
Implementation Through Existing Programs **Requirement §201.6(c)(4)(ii):**	[The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate…	Section 5.2	3-48 (worksheet) 4-6	
Continued Public Involvement **Requirement §201.6(c)(4)(iii):**	[The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.	Section 5.3	3-50 (worksheet) 4-6	
State Requirements				

FEMA Region III - Pennsylvania
Local Mitigation Plans
Part 3 Plan Review Criteria
Disaster Mitigation Act of 2000
44 CFR Parts 201 and 206; Interim Final Rule

Name of Plan Clearfield County

Section from the Interim Final Rule Part 201	Requirement as taken from the Interim Final Rule	Indicate where the information is located in the Basic Plan and/or Annex and Section or Page #(s)	For further explanation and examples see Page # indicated below from the State and Local Plan Interim Criteria Under the Disaster Mitigation Act of 2000 Document	**Scoring System** Met/Not Met Unsatisfactory Needs Improvement Satisfactory Outstanding **STATE/FEMA Reviewer Comments**
Location identification	The State requires that the plan cover contains at least the county name.	Cover of plan		
Project identification	The State requires that Hazard Mitigation Project Opportunity Forms be included.	App. K		
Electronic deliverable	The State requires that plan be submitted with a PDF or similar electronic file of the document.	Enclosed with final plan		

***States that have additional requirements can add them in the appropriate sections of the plan or create a new section. States need then modify this worksheet to record the score for those requirements.**

FEMA Region III - Pennsylvania
Local Mitigation Plans
Part 3 Plan Review Criteria
Disaster Mitigation Act of 2000
44 CFR Parts 201 and 206; Interim Final Rule

Name of Plan Clearfield County

Local Mitigation Plan Review

Local Requirement: ***Inclusion of Hazard mitigation Opportunity Form(s)***		
Local Plan Reviewed by:	**Title:**	**Date:**
Local Plan Submitted to the State by:	**Title:**	**Date:**

State Requirement		
State Reviewer:	**Title:**	**Date:**

FEMA Requirement		
FEMA Reviewer:	**Title:**	**Date:**
Date Received in FEMA Region VIII		
Plan Not Approved		
Plan Approved		
Date Approved		

Appendix K. Hazard Mitigation
Project Opportunity Forms

DATE: 04-14-04

NAME OF PROJECT: Obtain updated detailed flood studies and FIRMs
Municipality: All except Falls Creek, Lumber City, New Washington, Pine, Ramey, Troutville, and Wallaceton
County: Clearfield

PROJECT CONTACT
NAME: Melanie Voris
TITLE: Director, Department of Emergency Management
AGENCY: Clearfield County DEM
LOCATION OF PROJECT: Various properties

ELEVATION Various **CERTIFICATE Y / N**
Is the property within the 100 yr flood plain? Yes
The property is located on Firm Panel Number Various FIRMS

FLOOD INSURANCE Y/N Unknown **Date of Insurance Verification _____**

BRIEF DESCRIPTION OF PROJECT:

Obtain updated detailed flood studies and FIRMs (including 500-year flood) for areas with the greatest potential damage and threat to residents.

Apply to FEMA for updates of the most outdated FIRMs for high-hazard areas. Also apply to FEMA for funding to undertake detailed flood studies for County's high-hazard areas to determine base flood elevations and a full range of flood-recurrence intervals (2, 5, 10, 25, 50 and 100-year events) for use in future refinements of the mitigation plan.

BRIEF DESCRIPTION OF PROBLEM TO BE SOLVED:

There are 3,269 properties in the County in the100-year floodplain, but lack of base flood elevation for 1,447 of these structures prevents an accurate flood-loss estimate (or cost-benefit analysis) from being done. The ages of FIRMS in the County are shown in Table 1; 58 of these are more than 30 years old.

TOTAL ESTIMATED COST: $15,000

SOURCE OF FUNDING FOR NON-FEDERAL SHARE: To be determined

Table 1. Ages of FIRMS

Year	Number
1974	58
1975	33
1976	8
1978	2
1979	10
1980	13
1984	17
1986	16
1989	41
1990	20

DATE: 04-14-04

NAME OF PROJECT: Identify residents with highest vulnerability to severe weather
Municipality: All
County: Clearfield

PROJECT CONTACT
NAME: Melanie Voris
TITLE: Director, Department of Emergency Management
AGENCY: Clearfield County DEM
LOCATION OF PROJECT: Various properties

ELEVATION N/A **CERTIFICATE Y / N**
Is the property within the 100 yr flood plain? N/A
The property is located on Firm Panel Number N/A

FLOOD INSURANCE Y/N N/A **Date of Insurance Verification _____**

BRIEF DESCRIPTION OF PROJECT:

Identify residents with the highest relative vulnerability to the effects of severe weather and prepare implementation plan.

Evaluate communities that require warning systems and storm shelters. If warranted, implement additional storm shelters and warning systems, including:

- "Reverse 911" systems,
- Real-time weather data for emergency management personnel, or
- NOAA weather radios for vulnerable populace.

BRIEF DESCRIPTION OF PROBLEM TO BE SOLVED:

There are many residents with the high vulnerability to the effects of severe weather.

TOTAL ESTIMATED COST: $160,000

SOURCE OF FUNDING FOR NON-FEDERAL SHARE: To be determined

DATE: 04-14-04

NAME OF PROJECT: Evaluate protection of critical facilities in high-hazard areas
Municipality: Bell, Bigler, Bloom, Bradford, Chester Hill, Coshocton, Cooper, Curwensville, DuBois, Lawrence, Morris, Pike, Sandy
County: Clearfield

PROJECT CONTACT
NAME: Melanie Voris
TITLE: Director, Department of Emergency Management
AGENCY: Clearfield County DEM
LOCATION OF PROJECT: Various properties

ELEVATION N/A **CERTIFICATE Y / N**
Is the property within the 100 yr flood plain? N/A
The property is located on Firm Panel Number N/A

FLOOD INSURANCE Y/N N/A **Date of Insurance Verification _____**

BRIEF DESCRIPTION OF PROJECT:

Assess protection of existing critical structures with the highest relative vulnerability to the effects of flooding, severe weather and land failure. Develop a comprehensive approach to reducing the possibility of damage and loss of function to critical facilities.

- Obtain more detailed information on each facility, including number of residents, first-floor elevations, market and/or replacement value, construction type, etc.
- Prioritize the critical facilities in hazard areas to determine which have the highest relative vulnerability.
- Conduct cost-benefit analysis to determine the best property and personnel protection methods to promote with the individual property owners.

BRIEF DESCRIPTION OF PROBLEM TO BE SOLVED:

There are many existing critical facilities with the high vulnerability to the effects of flooding, severe weather and land failure. There are 25 critical facilities in the 100-year floodplain and six in areas subject to land failure (see Table 2).

TOTAL ESTIMATED COST: $30,000

SOURCE OF FUNDING FOR NON-FEDERAL SHARE: To be determined

Table 2. Critical Facilities Mapped Within Hazard Zones

Facility	Municipality	Type of Facility	Floods	Land Failure
School at 5995 Fire Tower Rd	Bell Township	School	X	
Government Bldg at 6302 Cross Roads Blvd	Bigler Township	Government Bldg	X	
Government Bldg at 6209 Greenville Pike	Bloom Township	Government Bldg	X	
Fire Co at 2421 Pinetop Rd	Bradford Township	Fire Co	X	X
Government Bldg at 2289 Barrett Rd	Bradford Township	Government Bldg	X	X
Fire Co at 302 Walton St	Chester Hill Borough	Fire Co	X	
Government Bldg at 920 Walton St	Chester Hill Borough	Government Bldg	X	
Hospital at 809 Turnpike Ave	Clearfield Borough	Hospital	X	
Government Bldg at 93 Rolling Stone Rd	Cooper Township	Government Bldg	X	
School at 650 Beech St	Curwensville Borough	School	X	
Fire Co at 12 Main St	DuBois City	Fire Co	X	
Government Bldg at 33 Brady St	DuBois City	Government Bldg	X	
School at College Pl	DuBois City	School	X	
School at 1259 Lecontes Mills Rd	Girard Township	School		X
Government Bldg at 1924 Daisy Street Ext	Lawrence Township	Government Bldg	X	
Government Bldg at 230 Hammermill Rd	Lawrence Township	Government Bldg	X	
Clearfield Municipal Authority Sewage Plant	Lawrence Township	Hazmat		X
Clearfield Water Treatment Plant	Lawrence Township	Hazmat		X
School at 123 Byers St	Lawrence Township	School	X	
School at 125 Byers St	Lawrence Township	School	X	
School at 2831 Washington Ave	Lawrence Township	School	X	
School at 438 River Rd	Lawrence Township	School	X	
School at 56 Alliance Rd	Lawrence Township	School	X	
School at 6264 Clearfield Woodland Hwy	Lawrence Township	School	X	
Morrisdale Mine	Morris Township	Dams		X
Government Bldg at 1189 Oak Grove Rd	Morris Township	Government Bldg	X	
Government Bldg at 12903 Curwensville Tyrone Hwy	Pike Township	Government Bldg	X	
Sears Parts & Service	Sandy Township	Hazmat	X	
Total Environmental Solutions - Well 14	Sandy Township	Hazmat	X	
		Totals	25	6

DATE: 04-14-04

NAME OF PROJECT: Evaluate protection of repetitive-flood-loss assets
Municipality: City of Dubois, and Boroughs of Coalport, Westover, Curwensville, Mahaffey, Coshocton and Irvona
County: Clearfield

PROJECT CONTACT
NAME: Melanie Voris
TITLE: Director, Department of Emergency Management
AGENCY: Clearfield County DEM
LOCATION OF PROJECT: Various properties

ELEVATION Various **CERTIFICATE Y / N**
Is the property within the 100 yr flood plain? Yes
The property is located on Firm Panel Number Various FIRMS

FLOOD INSURANCE Y/N Unknown **Date of Insurance Verification _____**

BRIEF DESCRIPTION OF PROJECT:

Address lack of detailed information for individual repetitive-flood-loss structures, and then determine best mitigation actions for each structure.

- Obtain more detailed information on each structure, including first-floor elevations, market and/or replacement value, construction type, etc.
- Determine which structures have the highest relative vulnerability.
- Conduct cost-benefit analysis to determine the best property protection methods to promote with the individual property owners.

BRIEF DESCRIPTION OF PROBLEM TO BE SOLVED:

Repetitive-loss (RL) properties under the National Flood Insurance Program (NFIP) guidelines include any building with two or more flood losses (occurring more than ten days apart) greater than $1,000 in any 10-year period since 1978. FEMA maintains a national list of such properties, and Table 3 indicates the 24 RL properties in Clearfield County. FEMA has specifically targeted certain RL properties (i.e., those with the greatest number of claims); 164 of those target properties are in Pennsylvania (and one of them is in the County).

TOTAL ESTIMATED COST: $15,000

SOURCE OF FUNDING FOR NON-FEDERAL SHARE: To be determined

Table 3. Repetitive Flood-Loss Properties

Municipality	No.
Dubois City	8
Coalport Borough	7
Westover Borough	3
Curwensville Borough	2
Mahaffey Borough	2
Clearfield Borough	1
Irvona Borough	1

Source: FEMA

Includes 1 of 164 target flood properties in Pa

Resolution No. 2004-#14

WHEREAS Clearfield County is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Department of Emergency Management, Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the County, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Clearfield County Board of Commissioners that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan.
- The Clearfield County Hazard Mitigation Planning Committee is hereby recognized as the official advisory body for coordinating hazard mitigation planning and related implementation activities by the County.
  The Committee shall meet as often as necessary, but at least yearly, to prepare or review mitigation activities and progress toward implementing the Hazard Vulnerability Assessment and Mitigation Plan. All meetings of the Committee shall be open to the public.
  The respective County officials and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this the 7th day of September, 2004

Chairman, Clearfield County Board of Commissioners, Clearfield County, Pennsylvania

Vice-chairman Clearfield County Board of Commissioners, Clearfield County, Pennsylvania

Commissioner, Clearfield County Board of Commissioners, Clearfield County, Pennsylvania

ATTESTED and FILED this 7th day of September, 2004

Chief Clerk of Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 2004-08-2

WHEREAS the Township of BECCARIA, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Township of BECCARIA, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Board of Supervisors of the Township of BECCARIA that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Township of BECCARIA.
  By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Board of Supervisors of the Township of BECCARIA
- The respective Board of Supervisors and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 3RD day of AUGUST, 2004

William H. Oshall

Chairman of the board of Supervisors of BECCARIA Township, Clearfield County, Pennsylvania

Supervisor, of BECCARIA Township, Clearfield County, Pennsylvania

Supervisor of, BECCARIA Township, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 2-04

WHEREAS the Township of Bell, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Township of Bell, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Board of Supervisors of the Township of Bell that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Township of Bell.
- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Board of Supervisors of the Township of Bell.
- The respective Board of Supervisors and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 7 day of August, 2004

Kenneth R Vaux

Chairman of the board of Supervisors of Bell Township, Clearfield County, Pennsylvania

Steven R Dyer

Supervisor, of Bell Township, Clearfield County, Pennsylvania

_____

Supervisor of, _____ Township, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 2004-6

WHEREAS the Township of Bradford, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Township of Bradford, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Board of Supervisors of the Township of Bradford that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Township of Bradford.
- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Board of Supervisors of the Township of _____.
- The respective Board of Supervisors and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 3rd day of August, 2004

Charles A. Reed

Chairman of the board of Supervisors of Bradford Township, Clearfield County, Pennsylvania

Ronald L Maines

Supervisor, of Bradford Township, Clearfield County, Pennsylvania

William Graham

Supervisor of, Bradford Township, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 8-04

WHEREAS the Township of Brady, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Township of Brady, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Board of Supervisors of the Township of Brady that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Township of Brady.
- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Board of Supervisors of the Township of Brady
- The respective Board of Supervisors and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 2 day of August, 2004

Lester Nachod

Chairman of the board of Supervisors of Brady Township, Clearfield County, Pennsylvania

x Darryl Beatty

Supervisor, of Brady Township, Clearfield County, Pennsylvania

x Bryan Hartfield

Supervisor of, Brady Township, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 2-2004

WHEREAS the Borough of Brisbin, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Borough of Brisbin, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Borough Council of the borough of Brisbin that:

The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Borough of **Brisbin**.
By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Borough Council of the Borough of Brisbin
The respective Borough Council and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this ~~9th~~ day of August, 2004

_____

Council President of Brisbin Borough, Clearfield County, Pennsylvania

_____

Councilmember, of Brisbin Borough, Clearfield County, Pennsylvania

_____

Councilmember of, Brisbin Borough, Clearfield County, Pennsylvania

_____

Councilmember, of Brisbin Borough, Clearfield County, Pennsylvania

_____

Councilmember of, _____ Borough, Clearfield County, Pennsylvania

_____

Councilmember of, _____ Borough, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 04-8-12

WHEREAS the Township of Chest, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Township of Chest, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Board of Supervisors of the Township of Chest that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Township of Chest.
- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Board of Supervisors of the Township of Chest
- The respective Board of Supervisors and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 12 day of AUGUST, 2004

Carl E Mills Jr

Chairman of the board of Supervisors of CHEST Township, Clearfield County, Pennsylvania

Leroy G Brink

Supervisor, of Chest Township, Clearfield County, Pennsylvania

Tanya M. Kunsman

Supervisor of, Chest Township, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

COPY

Resolution No. 08-10-04

WHEREAS the Borough of Chester Hill, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Borough of Chester Hill, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Borough Council of the borough of Chester Hill that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Borough of Chester Hill.
- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Borough Council of the Borough of Chester Hill.
- The respective Borough Council and agencies id n the strategy of the Plan are hereby directed to implement the recommended s assigned to them. They will consult semi-annually with the Clearfield County Hazar tion Planning Committee on the progress of their activities.

ADOPTED this 10th day of August, 2004

Lyle R. Fowler

Council President of Chester Hill Borough, Clearfield County, Pennsylvania

James R. Dunbar

Councilmember, of Chester Hill Borough, Clearfield County, Pennsylvania

Councilmember of, Chester Hill Borough, Clearfield County, Pennsylvania

Joann Raymond

Councilmember, of Chester Hill Borough, Clearfield County, Pennsylvania

Councilmember of, Chester Hill Borough, Clearfield County, Pe ia

Councilmember of, Chester Hill Borough, Clearfield County

RESOLUTION
No. 08-2004
BOROUGH OF CLEARFIELD
COMMONWEALTH OF PENNSYLVANIA

Clearfield County Hazard Mitigation Plan Adoption Resolution

WHEREAS the Borough of Clearfield, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Borough of Clearfield, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Borough Council of the borough of Clearfield that:

The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Borough of Clearfield.

- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Borough Council of the Borough of Clearfield.
- The respective Borough Council and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

IN WITNESS WHEREOF, the undersigned has hereunto set his hand and affixed the seal of the Local Government Unit this 19th day of August, 2004.

BOROUGH OF CLEARFIELD

BY Allan L Martin
President of Clearfield Borough Council

(SEAL)

ATTEST:
Pamela K. Peters
Secretary

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 04-05

WHEREAS the Borough of COALPORT, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Borough of COALPORT, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Borough Council of the borough of COALPORT that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Borough of COALPORT.
- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Borough Council of the Borough of COALPORT
- The respective Borough Council and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 2nd day of August, 2004

COALPORT BOROUGH COUNCIL

Council President of COALPORT Borough, Clearfield County, Pennsylvania

Councilmember, of COALPORT Borough, Clearfield County, Pennsylvania

Vice-President

Councilmember of, COALPORT Borough, Clearfield County, Pennsylvania

Councilmember, of COALPORT Borough, Clearfield County, Pennsylvania

Councilmember of, COALPORT Borough, Clearfield County, Pennsylvania

Councilmember of, COALPORT Borough, Clearfield County, Pennsylvania

_____

Councilmember of, COALPORT Borough, Clearfield County, Pennsylvania

_____

Councilmember of, _____ Borough, Clearfield County, Pennsylvania

_____

Councilmember of, _____ Borough, Clearfield County, Pennsylvania

_____

Councilmember of, _____ Borough, Clearfield County, Pennsylvania

_____

Mayor of, COALPORT Borough, Clearfield County, Pennsylvania

Josephine Bowman - Mayor.

ATTEST:

Paul W. Winslow

Paul W. Winslow,
Acting Secretary

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 04-08-19

WHEREAS the Township of Cooper, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Township of Cooper, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Board of Supervisors of the Township of Cooper that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Township of Cooper.
  By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Board of Supervisors of the Township of Cooper.
- The respective Board of Supervisors and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 19th day of August, 2004

Chairman of the board of Supervisors of Cooper Township, Clearfield County, Pennsylvania

Wayne T. Josephson Chairman

Supervisor, of Cooper Township, Clearfield County, Pennsylvania

Jack L. Wilkinson Vice-Chairman

Supervisor of, Cooper Township, Clearfield County, Pennsylvania

Secretary/Treasurer of Cooper Township

Shirley J. Wittlinger

AUG 2 2004

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 2004-01

WHEREAS the Township of Covington, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Township of Covington, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Board of Supervisors of the Township of Covington that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Township of Covington.
- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Board of Supervisors of the Township of Township.
- The respective Board of Supervisors and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 5th day of August, 2004

Bradley L Lutz

Chairman of the board of Supervisors of Covington Township, Clearfield County, Pennsylvania

Duane T Benard

Supervisor, of Covington Township, Clearfield County, Pennsylvania

Lewis Dumont

Supervisor of, Covington Township, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. ———

WHEREAS the Borough of Curwensville, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Borough of Curwensville, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Borough Council of the borough of Curwensville that:

The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Borough of Curwensville
By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Borough Council of the Borough of Curwensville

- The respective Borough Council and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 9th day of August, 2004

Council President of Curwensville Borough, Clearfield County, Pennsylvania

Councilmember, of Curwensville Borough, Clearfield County, Pennsylvania

Councilmember of Curwensville Borough, Clearfield County, Pennsylvania

Councilmember, of Curwensville Borough, Clearfield County, Pennsylvania

Councilmember of, Curwensville Borough, Clearfield County, Pennsylvania

Councilmember of, _____ Borough, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. _____

WHEREAS the City of DuBois, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the City of DuBois, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by DuBois City Council that:

The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the City of DuBois.
By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to DuBois City Council.
The respective City Council and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 9th day of August, 2004

John F. Sunseri

Council President, City of DuBois, Clearfield County, Pennsylvania

Mary E. Schmit

Councilmember, City of DuBois, Clearfield County, Pennsylvania

William R. Bayle

Councilmember, City of DuBois, Clearfield County, Pennsylvania

John A. Mikula

Councilmember, City of DuBois, Clearfield County, Pennsylvania

Gary A. Gilbert

Councilmember, City of DuBois, Clearfield County, Pennsylvania

_____

Councilmember, City of DuBois, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. ~~04~~ 05 - 2004

WHEREAS the Borough of Falls Creek, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Borough of Falls Creek, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Borough Council of the borough of Falls Creek that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Borough of Falls Creek.
  By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Borough Council of the Borough of Falls Creek.
  The respective Borough Council and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 2nd day of August, 2004

Thomas J. Rodkey

Council President of Falls Creek Borough, Clearfield County, Pennsylvania

Earl Daugherty

Councilmember, of Falls Creek Borough, Clearfield County, Pennsylvania

Charles R. Moore

Councilmember of, Falls Creek Borough, Clearfield County, Pennsylvania

Judith K. Leech

Councilmember, of Falls Creek Borough, Clearfield County, Pennsylvania

Denise M. Kaufmann

Councilmember of, Falls Creek Borough, Clearfield County, Pennsylvania

Anthony Marchioni

Councilmember of, Falls Creek Borough, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 5-04

WHEREAS the Township of Ferguson, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Township of Ferguson, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Board of Supervisors of the Township of Ferguson that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Township of Ferguson.
- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Board of Supervisors of the Township of Ferguson.

The respective Board of Supervisors and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 3rd day of August, 2004

Donald R. Shubra

Chairman of the board of Supervisors of Ferguson Township, Clearfield County, Pennsylvania

Scott Blackburn

Supervisor, of Ferguson Township, Clearfield County, Pennsylvania

William Freyer

Supervisor of, Ferguson Township, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

COPY

Resolution No. 2004-03

WHEREAS the Township of Girard, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Township of Girard, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Board of Supervisors of the Township of Girard that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Township of Girard.
- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Board of Supervisors of the Township of Girard
- The respective Board of Supervisors and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 12th day of August, 2004

Vice Chairman of the board of Supervisors of Girard Township, Clearfield County, Pennsylvania

Eugene A. Smith

Supervisor, of Girard Township, Clearfield County, Pennsylvania

Supervisor of, Girard Township, Clearfield County, Pennsylvania

ATTEST:

Connie McGovern

Secretary

(SEAL)

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 2004-2

WHEREAS the Borough of Glen Hope, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Borough of Glen Hope, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Borough Council of the borough of Glen Hope that:

The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Borough of Glen Hope.

- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Borough Council of the Borough of Glen Hope
- The respective Borough Council and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 9 day of August, 2004

Council President of Glen Hope Borough, Clearfield County, Pennsylvania

Mayor ~~Councilmember, of~~ Richard F Dell Borough, Clearfield County, Pennsylvania 8/9/04

Councilmember of Glen Hope Borough, Clearfield County, Pennsylvania

Councilmember, of Glen Hope Borough, Clearfield County, Pennsylvania 8-9-04

Councilmember of, _____ Borough, Clearfield County, Pennsylvania

Councilmember of, _____ Borough, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 41-04

WHEREAS the Township of Graham Twp, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Township of Graham Twp, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Board of Supervisors of the Township of Graham that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Township of Graham.
- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Board of Supervisors of the Township of Graham
- The respective Board of Supervisors and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 9 day of August, 2004

David R. Hart

Chairman of the board of Supervisors of Graham Township, Clearfield County, Pennsylvania

Supervisor, of Graham Township, Clearfield County, Pennsylvania

Connie A Unwin

Supervisor of, Graham Township, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 6-04

WHEREAS the Township of Greenwood, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Township of Greenwood, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Board of Supervisors of the Township of Greenwood that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Township of Greenwood.
  By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Board of Supervisors of the Township of Greenwood
  The respective Board of Supervisors and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 2nd day of August, 2004

Harold B Wright

Chairman of the board of Supervisors of Greenwood Township, Clearfield County, Pennsylvania

_____

Supervisor, of Greenwood Township, Clearfield County, Pennsylvania

John J Hipps

Supervisor of, Greenwood Township, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 8-5-04

WHEREAS the Township of Gulich, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Township of Gulich, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Board of Supervisors of the Township of Gulich that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Township of Gulich.
- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Board of Supervisors of the Township of Gulich
- The respective Board of Supervisors and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 5th day of August, 2004

Alex E Solon

Chairman of the board of Supervisors of Gulich Township, Clearfield County, Pennsylvania

Kevin D Phillips

Supervisor, of Gulich Township, Clearfield County, Pennsylvania

_____

Supervisor of, _____ Township, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 2004 - 1

WHEREAS the Borough of Houtzdale, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Borough of Houtzdale, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Borough Council of the borough of Houtzdale that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Borough of Houtzdale.
  By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Borough Council of the Borough of Houtzdale
  The respective Borough Council and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 9 day of August, 2004

Paul Clancy

Council President of Houtzdale Borough, Clearfield County, Pennsylvania

Councilmember, of Houtzdale Borough, Clearfield County, Pennsylvania

Billy J Haywood

Councilmember of, Houtzdale Borough, Clearfield County, Pennsylvania

Carl Lantz

Councilmember, of Houtzdale Borough, Clearfield County, Pennsylvania

Councilmember of, Houtzdale Borough, Clearfield County, Pennsylvania

Councilmember of, Houtzdale Borough, Clearfield County, Pennsylvania

Patricia O'Shea

Councilmember of, Houtzdale Borough, Clearfield County, Pennsylvania

_____

Councilmember of, _____ Borough, Clearfield County, Pennsylvania

_____

Councilmember of, _____ Borough, Clearfield County, Pennsylvania

_____

Councilmember of, _____ Borough, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 2004-01

WHEREAS the Township of Huston, Clearfield County, is vulnerable to natural hazards like flooding, wind, and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Township of Huston, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Board of Supervisors of the Township of Huston that:

The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby Adopted as an official plan of the Township of Huston.

- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee Shall prepare an annual evaluation report to the Board of Supervisors of the Township of Huston.

- The respective Board of Supervisors and agencies identified in the strategy of the Plan Are hereby directed to implement the recommended activities assigned to them. They Will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 3rd day of August, 2004.

Tamra L. McClintick, Chairman of the Board of Supervisors of Huston Township, Clearfield County, Pennsylvania

Darrell J. Patton, Jr., Supervisor of Huston Township, Clearfield County, Pennsylvania

Nellie M Bundy, Supervisor of Huston Township, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 2004-2

WHEREAS the Borough of Irvona, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Borough of Irvona, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Borough Council of the borough of Irvona that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Borough of _____.
  By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Borough Council of the Borough of Irvona
- The respective Borough Council and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 5th day of August, 2004

Margaret A. McCoy

Council President of Irvona Borough, Clearfield County, Pennsylvania

Norman D. Snell VP

Councilmember, of Irvona Borough, Clearfield County, Pennsylvania

Thomas E Chiuttle

Councilmember of, Irvona Borough, Clearfield County, Pennsylvania

Robert Bragg

Councilmember, of Irvona Borough, Clearfield County, Pennsylvania

Joseph R. Love

Councilmember of, Irvona Borough, Clearfield County, Pennsylvania

John F Gallagher

Councilmember of, Irvona Borough, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 2004-4

WHEREAS the Township of Karthaus, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Township of Karthaus, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Board of Supervisors of the Township of Karthaus that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Township of Karthaus.
- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Board of Supervisors of the Township of Karthaus.
- The respective Board of Supervisors and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 9th day of August, 2004

Eugene Gordon

Chairman of the board of Supervisors of Karthaus Township, Clearfield County, Pennsylvania

Wilbur D. Moore

Supervisor, of Karthaus Township, Clearfield County, Pennsylvania

Peter E. Woodle

Supervisor of, Karthaus Township, Clearfield County, Pennsylvania

Karthaus Township
Board Of Supervisors

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 2004-8-4

WHEREAS the Township of Knox, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Township of Knox, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Board of Supervisors of the Township of Knox that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Township of Knox.
  By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Board of Supervisors of the Township of Knox
- The respective Board of Supervisors and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 2nd day of August, 2004

Richard N. Aughenbaugh Sr.
Richard N. Aughenbaugh Sr.
Chairman of the board of Supervisors of Knox Township, Clearfield County, Pennsylvania

Larry F. Fetters
Larry F. Fetters
Supervisor, of Knox Township, Clearfield County, Pennsylvania

[redacted] William J. Reed
William J. Reed
Supervisor of, Knox Township, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION
RESOLUTION

Resolution No. 05

WHEREAS the Township of Lawrence, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Township of Lawrence, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Board of Supervisors of the Township of Lawrence that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation plan is hereby adopted as an official plan of the Township of Lawrence.
- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Board of Supervisors of the Township of Lawrence.
- The respective Board of supervisors and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 3 day of August, 2004

William D. Lawhead

Chairman of the board of Supervisors of Lawrence Township, Clearfield County, Pennsylvania

Edward E. Brown

Supervisor, of Lawrence Township, Clearfield County, Pennsylvania

David D. Mitchell SR.

Supervisor, of Lawrence Township, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 04-2

WHEREAS the Borough of Lumber City, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Borough of Lumber City, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Borough Council of the borough of Lumber City that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Borough of Lumber City.
- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Borough Council of the Borough of Lumber City
- The respective Borough Council and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 9th day of Aug, 2004

Council President of Lumber City Borough, Clearfield County, Pennsylvania

Gregory E Hughes

Councilmember, of Lumber City Borough, Clearfield County, Pennsylvania

Karen Gressler

Councilmember of, Lumber City Borough, Clearfield County, Pennsylvania

Vacant position

Mayor

~~Councilmember~~, of Lumber City Borough, Clearfield County, Pennsylvania

Councilmember of, _____ Borough, Clearfield County, Pennsylvania

Councilmember of, _____ Borough, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 04-804

WHEREAS the Township of Morris, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Township of Morris, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Board of Supervisors of the Township of Morris that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Township of Morris.
- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Board of Supervisors of the Township of Morris
- The respective Board of Supervisors and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 4th day of August, 2004

Chairman of the board of Supervisors of Morris Township, Clearfield County, Pennsylvania

John J Sayers Jr

Supervisor, of Morris Township, Clearfield County, Pennsylvania

Harold Merlo

Supervisor of, Morris Township, Clearfield County, Pennsylvania

Clearfield County Emergency Management
911 Leonard Street

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 02-2004

WHEREAS the Borough of New Washington, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Borough of New Washington, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Borough Council of the borough of New Washington that:

The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Borough of New Washington.
By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Borough Council of the Borough of New Washington.
The respective Borough Council and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 2nd day of August, 2004

Council President of New Washington Borough, Clearfield County, Pennsylvania
William Bruce

Councilmember, of New Washington Borough, Clearfield County, Pennsylvania
Roger Whitaker

Councilmember of, New Washington Borough, Clearfield County, Pennsylvania
Scott Bowser

Councilmember, of New Washington Borough, Clearfield County, Pennsylvania
Vance McLaughlin

Councilmember of, New Washington Borough, Clearfield County, Pennsylvania
Randy A. Clark

Councilmember of, _____ Borough, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 04-03

WHEREAS the Township of PENN, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Township of PENN, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Board of Supervisors of the Township of PENN that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Township of PENN.
- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Board of Supervisors of the Township of PENN.
- The respective Board of Supervisors and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 3rd day of August, 2004

James L. Sleppy, Chairman

Chairman of the board of Supervisors of Penn Township, Clearfield County, Pennsylvania

Robert L. Newsplan

Supervisor, of Penn Township, Clearfield County, Pennsylvania

Joseph Ruhl

Supervisor of, Penn Township, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 234

WHEREAS the Township of Pike, Clearfield County , is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Township of Pike , and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Board of Supervisors of the Township of Pike that:

The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Township of Pike.

By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Board of Supervisors of the Township of Pike.

The respective Board of Supervisors and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPED this 4th day of August, 2004

_____

Chairman of the board of Supervisors of Pike Township, Clearfield County, Pennsylvania

_____, Spencer J. Irwin

Supervisors, of Pike Township, Clearfield County Pennsylvania

_____, David L. Kephart

Supervisor of, Pike Township, Clearfield County, Pennsylvania

_____, Patrick B. Morgan.

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 200401

WHEREAS the Township of PINE, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Township of PINE, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Board of Supervisors of the Township of PINE that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Township of PINE.
- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Board of Supervisors of the Township of PINE
- The respective Board of Supervisors and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 25 day of AUGUST, 2004

Harry Pavlovich

Chairman of the board of Supervisors of PINE Township, Clearfield County, Pennsylvania

David Long

Supervisor, of PINE Township, Clearfield County, Pennsylvania

Robert E. Plant

Supervisor of, PINE Township, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 125

WHEREAS the Borough of Ramey, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Borough of Ramey, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Borough Council of the borough of Ramey that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Borough of Ramey
- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Borough Council of the Borough of Ramey
  The respective Borough Council and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 9th day of August, 2004

_____

Council President of Ramey Borough, Clearfield County, Pennsylvania
Frank Stewart

Councilmember, of Ramey Borough, Clearfield County, Pennsylvania
Shirley McClelland

Councilmember of, Ramey Borough, Clearfield County, Pennsylvania
Robert S Mowchan

Councilmember, of Ramey Borough, Clearfield County, Pennsylvania
Chuck M McCauley

Councilmember of, Ramey Borough, Clearfield County, Pennsylvania
Joseph Shedlock

Councilmember of, _____ Borough, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

SANDY TOWNSHIP

Resolution No. 2004-13

WHEREAS the Township of Sandy, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Township of Sandy, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Board of Supervisors of the Township of Sandy that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Township of Sandy
- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Board of Supervisors of the Township of Sandy
  The respective Board of Supervisors and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 2 day of August, 2004

Chairman of the board of Supervisors of Sandy Township, Clearfield County, Pennsylvania

Supervisor, of Sandy Township, Clearfield County, Pennsylvania

Supervisor of, Sandy Township, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 304

WHEREAS the Township of Union, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Township of Union, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Board of Supervisors of the Township of Union that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Township of Union.
- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Board of Supervisors of the Township of Union.
- The respective Board of Supervisors and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 10 day of Aug., 2004

Val Arnott

Chairman of the board of Supervisors of Union Township, Clearfield County, Pennsylvania

Blair Michael

Supervisor, of Union Township, Clearfield County, Pennsylvania

Donald E. Jones

Supervisor of, Union Township, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 04-01

WHEREAS the Borough of Wallaceton, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Borough of Wallaceton, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Borough Council of the borough of Wallaceton that:

- The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Borough of Wallaceton
- By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Borough Council of the Borough of Wallaceton

  The respective Borough Council and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 03 day of August, 2004

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Council President of Wallaceton Borough, Clearfield County, Pennsylvania

Mary Jo Stuhrenp

Councilmember, of Wallaceton Borough, Clearfield County, Pennsylvania

Michael Stewland

Councilmember of, Wallaceton Borough, Clearfield County, Pennsylvania

Tony Gallahan

Councilmember, of _____ Borough, Clearfield County, Pennsylvania

_____

Councilmember of, _____ Borough, Clearfield County, Pennsylvania

_____

Councilmember of, _____ Borough, Clearfield County, Pennsylvania

CLEARFIELD COUNTY HAZARD MITIGATION PLAN ADOPTION RESOLUTION

Resolution No. 081004

WHEREAS the Borough of WESTOVER, Clearfield County, is vulnerable to natural hazards like flooding, wind and weather hazards, drought, earthquakes, wildfires, and landslides that can result in property loss, loss of life, economic hardship and threats to public health and safety,

WHEREAS a Clearfield County Hazard Vulnerability Assessment and Mitigation Plan has been developed by Clearfield County Hazard Mitigation Planning Committee and the people of the County,

WHEREAS the Clearfield County Hazard Vulnerability Assessment and Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by the natural hazards that face the Borough of WESTOVER, and

WHEREAS a series of public meetings were held to develop and review the plan,

NOW THEREFORE BE IT RESOLVED by the Borough Council of the borough of WESTOVER that:

The Clearfield County Hazard Vulnerability Assessment and Mitigation Plan is hereby adopted as an official plan of the Borough of WESTOVER.
By September 30 each year, the Clearfield County Hazard Mitigation Planning Committee shall prepare an annual evaluation report to the Borough Council of the Borough of WESTOVER

- The respective Borough Council and agencies identified in the strategy of the Plan are hereby directed to implement the recommended activities assigned to them. They will consult semi-annually with the Clearfield County Hazard Mitigation Planning Committee on the progress of their activities.

ADOPTED this 10 day of AUGUST, 2004

Council President of WESTOVER Borough, Clearfield County, Pennsylvania

Beverly J. Adams

Councilmember of WESTOVER Borough, Clearfield County, Pennsylvania

Councilmember of, WESTOVER Borough, Clearfield County, Pennsylvania

Sandra Adams

Councilmember of WESTOVER Borough, Clearfield County, Pennsylvania

Kimberly Westover

Councilmember of, WESTOVER Borough, Clearfield County, Pennsylvania

Paul Smith

Councilmember of, WESTOVER Borough, Clearfield County, Pennsylvania

Debra McAfoose

Councilmember of, WESTOVER Borough, Clearfield County, Pennsylvania

Mary Holland

Councilmember of, _____ Borough, Clearfield County, Pennsylvania

_____

Councilmember of, _____ Borough, Clearfield County, Pennsylvania

_____

Councilmember of, _____ Borough, Clearfield County, Pennsylvania