

Jurisdiction: Emmet County + Jurisdictions	Title of Plan: Emmet Multi-jurisdictional Hazard Mitigation Plan	Date of Plan: 2013
Local Point of Contact: Darren Bumgarner	Address: 217 W 5 th St Spencer, IA 51301	
Title: Planner		
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Funding Source:		
State Reviewer:	Title:	Date:
FEMA Reviewer: Lynn Jameson Steve Greene	Title: HM Community Planner HM Community Planner	Date: 10-2-2013 10-8-2013, 10-30-2013
Date Received in FEMA Region VII	08-12-2013, 10-24-2013	
Plan Not Approved		
Plan Approvable Pending Adoption		
Plan Approved	10-30-2013	

Jurisdiction:	NFIP Status*	
	Y	NP
Emmet County	✓	
Armstrong		✓
Dolliver		✓
Estherville	✓	
Gruver		✓
Ringsted		✓
Wallingford	✓	
Iowa Lakes Community College		✓

* Notes: Y = Participating NP = Not Participating in NFIP S- Sanctioned R-Rescinded

SECTION 1: REGULATION CHECKLIST

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT A. PLANNING PROCESS				
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	Section 1 pg 4	✓		
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	Section 1 pg 4-6	✓		
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	Section 1 pg 4-6	✓		
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	Section 1 pg 9 Section 9 pg 108	✓		
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	Section 8 pg 105 Section 9 pg 108	✓		
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	Section 8 pg 105 Section 9 pg 108	✓		
<u>ELEMENT A: REQUIRED REVISIONS</u>				

1. REGULATION CHECKLIST

Regulation (44 CFR 201.6 Local Mitigation Plans)

Location in Plan
(section and/or
page number)

Met Not
Met Met

ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT

B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Section 3, pg 22 Section 4, pg 26	✓	
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	Section 3, pg 24 Section 4, pg 26	✓	
B3. Is there a description of each identified hazard’s impact on the community as well as an overall summary of the community’s vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	Section 3, pg 24 Section 4, pg 26	✓	
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	Section 7, pg 90	✓	

ELEMENT B: REQUIRED REVISIONS

ELEMENT C. MITIGATION STRATEGY

C1. Does the plan document each jurisdiction’s existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	Section 1.7, pg 9 Section 9, pg 108	✓	
C2. Does the Plan address each jurisdiction’s participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	Section 7, pg 90	✓	
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Section 6, pg 78	✓	
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	Section 6, pg 78	✓	
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	Section 6, pg 79-89	✓	
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	Section 9, pg 108	✓	

ELEMENT C: REQUIRED REVISIONS

1. REGULATION CHECKLIST

Regulation (44 CFR 201.6 Local Mitigation Plans)

Location in Plan
 (section and/or
 page number)

Met

Not
 Met

ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)

D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	Section 9, pg 108	✓	
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Section 9, pg 108,176	✓	
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	Section 9, pg 108	✓	

ELEMENT D: REQUIRED REVISIONS

ELEMENT E. PLAN ADOPTION

E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))			✓
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))			✓

ELEMENT E: REQUIRED REVISIONS

Written proof that all jurisdictions' governing bodies have formally adopted the plan (usually a resolution) must be submitted to FEMA. See *Local Multi-Hazard mitigation Planning Guidance (July 2008) pages 17-18*.

Note: If the plan is not adopted by a participating jurisdiction, that jurisdiction would not be eligible for project grants under the following hazard mitigation assistance programs: HMGP, PDM, FMA, and SRL.

SECTION 2: PLAN ASSESSMENT

A. Plan Strengths and Opportunities for Improvement

This section provides a discussion of the strengths of the plan document and identifies areas where these could be improved beyond minimum requirements.

Element A: Planning Process

Plan Strengths

- The citizen participation is impressive. A large number of people from a wide variety of occupations attended planning meetings. There were almost 25 at the Armstrong meeting, a City of 845; 14 at Dolliver, a City of 76; and 39 at Ringstead, a City of 391. The good note taking reflected good discussion at the meetings.

Element B: Hazard Identification and Risk Assessment

Plan Strengths

- The analysis and justification as to why Earthquakes will not be addressed in the plan is excellent.
- “Each committee was asked to designate on their critical facilities map which areas were most prone to grass or wildland fires. Most communities determined that those buildings closest to farm fields would be the most likely to be damaged by a wildland fire. The communities marked on their maps the areas most prone then estimated the type of structures and cost based on the average. The estimated buildings and value are presented below.” Impressive! (p. 65)
- P. 38: Communities delineated areas that are subject to flash flooding and the number of structures that are in those areas. This is an excellent approach.

Opportunities for Improvement

- P. 15: For orientation purposes, State-wide maps should have some sort of symbol designating the County.
- P. 24: A map of Expansive Soils in Iowa with a notation of the Emmet County location would be helpful in supporting the justification for not including this hazard.

Element C: Mitigation Strategy

Plan Strengths

Opportunities for Improvement

- More attention to how Actions are written would make them easier to understand and easier to implement:
 - “Designating Community Shelter” could be rewritten as “Designate an existing building as a Community Shelter” or “Inform the public about existing community shelters” or “Develop criteria for designating appropriate Community Shelters.”
 - “Good Neighbor Program” could be rewritten as “Develop a Good Neighbor Program that would” or “Continue the Good Neighbor Program” or “Investigate the potential of establishing a Good Neighbor Program in”
 - “Promote Landscaping Practices” could be rewritten as “Promote Landscaping Practices that maximize soil absorption and minimize run-off from heavy rains.”
 - “Snow Removal Policy” could be rewritten as “Develop a Snow Removal Policy”, “Enforce a Snow Removal Policy”, “Research the feasibility of a Snow Removal Policy”
 - “Building/Zoning Codes” could be rewritten as “Adopt . . .”, “Update . . .”, “Enforce . . .”
- PP. 118: City maps need legend and a title including the name of the City. What do the orange outlined and striped areas mean? What do the blue outlined and striped areas mean? This should be on the legend. Discussion of the maps including an overall statement of critical facilities in relation to hazards is essential to understanding the maps.

B. Resources for Implementing Your Approved Plan

A variety of mitigation resources are available to communities. The Iowa Homeland Security & Emergency Management website: http://www.iowahomelandsecurity.org/disasters/hazard_mitigation.html provides planning and project related information as well as details on how major FEMA mitigation programs are implemented in the State.

HSEMD's training website provides information on upcoming training opportunities within the State: <http://homelandsecurity.iowa.gov/training/>.

Various funding programs are available from several state and federal agencies to assist local jurisdictions in accomplishing their mitigation activities and goals. A detailed listing of programs, information on each program, and contact information is also available from the 2010 State Hazard Mitigation Plan.

Review of the FEMA HMA guidance (FY11 is the most current) is also encouraged as guidance provides information about application and eligibility requirements. This guidance is available from <http://www.iowahomelandsecurity.org/grants/HMA.html> or through FEMA's grant applicant resources page at http://www.fema.gov/government/grant/hma/grant_resources.shtm.

- The FEMA Hazard mitigation planning site <http://www.fema.gov/plan/mitplanning/index.shtm> contains the official guidance to meet the requirements of the Stafford Act, as well as other resources and procedures for developing and updating hazard mitigation plans.
- FEMA offers a Mitigation Best Practices Portfolio where communities can learn from others' successes, share their own successes, use the FEMA library, find detailed information and maps on hazards, read case studies, and find other resources for becoming a more resilient community: <http://www.fema.gov/plan/prevent/bestpractices/index.shtm>

The Department of Homeland Security's Federal Emergency Management Agency (FEMA) recently launched the new FEMA.gov. Please be informed that many of the most popular Hazard Mitigation Assistance web links have changed:

- Where can I get information on Hazard Mitigation Assistance? <https://www.fema.gov/hazard-mitigation-assistance>
- Hazard Mitigation Grant Program: <https://www.fema.gov/hazard-mitigation-grant-program>
- Pre-Disaster Mitigation Program: <https://www.fema.gov/pre-disaster-mitigation-grant-program>
- Flood Mitigation Assistance Program: <https://www.fema.gov/flood-mitigation-assistance-program>
- **Fiscal Year 2011 Unified Guidance (with updated links):**
<http://www.fema.gov/library/viewRecord.do?id=4225>
The Hazard Mitigation Assistance Unified Guidance dated June 1, 2010 applies to HMGP for disasters declared on or after June 1, 2010.
- Grant Applicant Resources : <https://www.fema.gov/site-page/grant-applicant-resources>
- Application Process: <https://www.fema.gov/site-page/application-development-and-process>
- Environmental and Historic Preservation (EHP) At-A-Glance: <http://www.fema.gov/library/viewRecord.do?id=5904> This document provides provides information on how to incorporate environmental and historic preservation considerations into your Hazard Mitigation Assistance application and project.
- Version 4.8 of the Benefit Cost Analysis Software is now available. The updated toolkit and updated training materials are available on the Benefit Cost Analysis website at <http://www.fema.gov/benefit-cost-analysis>.

If you need additional information contact the Hazard Mitigation Assistance Helpline at (866) 222-3580 or email hmagrantshelpline@fema.dhs.gov. Please allow up to 5 business days for a response.

Emmet County Iowa Multijurisdictional Hazard Mitigation Plan

Included Jurisdictions:

Emmet County (Rural)
Armstrong
Dolliver
Estherville
Gruver
Ringsted
Wallingford

Iowa Lakes Community College - Estherville

Prepared by
Northwest Iowa Planning and Development Commission

Spencer, IA 51301
www.nwipdc.org



FEMA

October 30, 2013

Mark Schouten, Administrator
Iowa Homeland Security & Emergency Management Division
7105 N.W. 70th Avenue
Camp Dodge, Bldg. W-4
Johnston, IA 50131

Subject: Review of the Emmet County, Iowa Hazard Mitigation Plan

Dear Mr. Schouten:

The purpose of this letter is to amend the completion date of the Emmet County plan and provide the status of the plan pursuant to the requirements of 44 CFR Part 201 - Mitigation Planning and the Local Multi-Hazard Mitigation Planning Guidance. The Local Hazard Mitigation Plan Review Tool documents the Region's review and compliance with all required elements of 44 CFR Part 201.6, as well as identifies the jurisdictions participating in the planning process. FEMA's approval will be for a period of five years effective starting with the date of this letter.

Prior to the expiration of the plan the community will be required to review and revise their plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval in order to continue to be eligible for mitigation project grant funding.

Plan Name	Date Submitted	Date Completed	Date of Plan Adoption	Date of Plan Expiration	Review Status
Emmet County	October 24, 2013	October 30, 2013	August 21, 2013	October 30, 2018	Approved

If you have any questions or concerns, please contact Joe Chandler, Planning Team Lead, at (816) 283-7071.

Sincerely,

Michael Scott, Director
Mitigation Division

Emmet County
Courthouse
609 1st Ave North
Estherville, IA 51334
Hours: M-F 8-4:30pm
Phone: 712-362-7454

Board of Supervisors

Alan Madden	Chairman
Beverly Juhl	Vice Chairperson
Jon Martyr	
Tim Schumacher	
Ron Smith	

County Departments

Barb Bohm	Assessor
Douglas Hansen	Attorney
Michele Erikson	Auditor
Dorothy Christensen	Case Management
Terry Reekers	Emergency Management
Roger Patocka	Engineer
Mike Martens	Sheriff
Susan Snyder	Recorder
Vickie Jurrens	Treasurer
Deb Tietje	Veterans Affairs

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GLOSSERY of terms to be defined in this Hazard Mitigation Plan

1. ***County***: Emmet County, Iowa
2. ***CMI***: Crop Moisture Index
3. ***EF or EF-Scale***: Enhanced Fujita Tornado Scale
4. ***EPA***: Environmental Protection Agency
5. ***FEMA***: Federal Emergency Management Agency
6. ***FIRM***: Flood Insurance Rate Map or ***DFIRM***: Digital Flood Insurance Rate Map
7. ***HAZMAT***: Hazardous materials response team from Mason City, Iowa
8. ***HLSEM***: Iowa Homeland Security Emergency Management
9. ***HMGF***: Hazard Mitigation Grant Program
10. ***IDNR***: Iowa Department of Natural Resources
11. ***IDOT***: Iowa Department of Transportation
12. ***ECEM***: Emmet County Emergency Management
13. ***NCDC***: National Climatic Data Center
14. ***NOAA***: National Oceanic and Atmospheric Administration
15. ***NWIPDC***: Northwest Iowa Planning & Development Commission
16. ***NWS***: National Weather Service
17. ***PDSI***: Palmer Drought Severity Index
18. ***Planning Committee***: Hazard Mitigation Planning Committee
19. ***ECS***: Emmet County Schools
20. ***SPC***: Storm Prediction Center
21. ***STAPLEE***: Social, Technical, Administrative, Political, Legal, Economic, & Environmental, evaluation criteria in establishing priority for hazard mitigation alternatives
22. ***State***: State of Iowa
23. ***USGS***: United States Geological Survey

Introduction

Floods, tornados, windstorms, and severe winter storms – these are all examples of natural hazards that affect Iowans each year. These events threaten thousands, even millions of dollars of property damage annually and can sometimes be fatal to persons and animals that are in harm’s way. To protect lives and property from natural or man-made hazards, it is vital for local leaders to identify potential losses and take measures to prevent such losses; this process is known as hazard mitigation planning.

Hazard mitigation is defined as any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event. Potential hazards can be natural, such as those described above or man-made such as an energy disruption/failure or transportation accidents involving hazardous materials. Mitigation encourages long-term reduction of vulnerability to natural and man-made hazards. The goal of mitigation is to save lives and reduce property damage. Mitigation actions should provide a cost-effective and environmentally sound method to reduce the enormous cost of disasters to property owners and all levels of government. Mitigation should also minimize disruption to communities by protecting critical resources and infrastructure such as water, food, shelter, energy, medical treatment, and transportation.

Background

The Federal Emergency Management Agency (FEMA) provides assistance to local governments for disaster response and recovery through the Stafford Disaster Relief and Emergency Assistance Act (Stafford Act). The Stafford Act aims at assisting communities that are affected by disasters. The Act was amended in 2000 to include The Disaster Mitigation Act of 2000. This amendment requires local governments to have adopted an approved Hazard Mitigation Plan in order to qualify for mitigation project funding. The purpose of this change is to encourage cities and counties to identify prevalent hazards and to determine appropriate mitigation strategies to protect property and save lives.

A Hazard Mitigation Plan is intended to accomplish several things. First, through the planning process, hazards that pose a risk to the community are identified. Next, an assessment of those hazards is made that takes into account the historical occurrences, probability, vulnerability, maximum threat, severity of impact and speed of onset of the hazard. Once the assessment is completed, a list of current and historic mitigation efforts is evaluated.

Once the hazards have been assessed and mitigation actions have been identified, the plan outlines implementation strategies. Some proposed projects are small in scope and thus relatively low cost. Other projects are broad in nature and would require more funding than the local community can reasonably provide. The plan highlights potential funding sources and identifies city/county departments responsible for implementation. Lastly, the plan outlines how to keep the public involved, and what steps should be taken by local government to ensure that the concept of hazard mitigation is always a priority.

When implemented appropriately, mitigation projects can save lives, reduce property damage, save public money, and protect the environment. Mitigation can reduce the enormous cost of disasters to property owners and all levels of government. In addition, mitigation can protect critical community facilities, reduce exposure to liability, and minimize community disruption.

Basis for Planning Authority

The basis for authority to create a natural hazard mitigation plan lies in Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), 42 U.S.C. 5165. This act was enacted under Section 104 of the Disaster Mitigation Act of 2000 (DMA 2000), P.L. 106-390. Section 104 is the legal basis

for FEMA's Interim Final Rule for 44 CFR Parts 201 and 206, published in the Federal Register on February 26, 2002.

Purpose

The purpose of the Emmet County Multi-Jurisdictional Hazard Mitigation Plan is to substantially and permanently reduce the county's vulnerability to natural hazards. The plan is intended to promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property and the natural environment. This can be achieved by increasing public awareness, documenting resources for risk reduction and loss-prevention, and identifying activities to guide the community towards the development of a safer, more sustainable community.

Section 1. Planning participation, Participating Jurisdictions and Adoption

This hazard mitigation plan is being developed to assess the ongoing mitigation goals in each participating community, to evaluate mitigation alternatives that should be undertaken, and to outline a strategy for implementation. Building a disaster resistant community is an initiative that challenges for Emmet County and participating jurisdictions, to undertake actions that protect families, businesses, and public facilities by reducing the effects of natural and man-made disasters. Reducing the effects of natural disasters makes economic sense, and it is good public policy because it protects our citizens and our future.

1.1 Regional Planning Participation

The county and cities have developed this Multijurisdictional Hazard Mitigation Plan with planning assistance from Northwest Iowa Planning & Development Commission. Northwest Iowa Planning & Development Commission is council of governments public planning agency established by Iowa Code 28E, 28H & 28I to provide planning assistance to a nine county area comprised of 79 cities and towns. Northwest Iowa Planning & Development Commission assisted in drafting the plan and provided input throughout the process.

1.2 Local Planning Participation

The Emergency Management Director Terry Reekers contacted each jurisdiction to inform them that they have to have at least two designated representatives from their jurisdiction to be the main contact points. The respective jurisdictions tried to designate hazard mitigation members which represented local government officials, utilities, police, fire, schools, businesses and the county sheriff's department. A listing of the "planning committee" is located in Section 1 of this plan. The jurisdictions established the planning committee members based on their knowledge of the city/county's infrastructure, emergency response services, historical occurrences of natural disasters and willingness to participate.

Table 1.1 Planning Committee for the County and Cities		
Emmet County:	Terry Reekers – Emergency Management	Kathy Preston – Public Health
	Kevin Olson – Deputy Sherriff	Roger Patocka – County Engineer
Armstrong	Gregory Buun – Fire Chief	Craig Merrill - Police
	Marvin Dailey – Mayor	Sandy Dailey – City Clerk
Dolliver	Sandy Holl – City Clerk	Jim Jones - Citizen
	Russell Deling – City Council	Brenda Deling – Citizen
Estherville	Barb Mack – Community Developer	Brent Shatto – Police Officer
	Richard Beaver – Fire Chief	Scott McDermott - Ambulance
Gruver	Wes Baddeley – Asst. Fire Chief	Loren Anderson – Mayor
	Brent Grems – Fire Dept	Tony Hanson – City Council
Ringsted	Dan Jorgensen – Mayor	Cathy Wikert – City Clerk
	Wayne Kruse – City Council	Charles James - Citizen
Wallingford	Terry Osher - Mayor	Ann VanDeWalle – City Clerk
	Jarrod Fischer – Fire Chief	Dennis VanDeWalle - Citizen
Iowa Lakes	Delaine Hiney – Facilities management	
Community College	Jeff Soper – Finance	

The public input was represented by the members of the planning committee. All of the committee members reside within the county limits. The hazard mitigation planning committee as a whole represents a good general cross section of those interested in and representing the critical facility interests of the jurisdictions. Through the planning process, public meeting notices were posted within the community to encourage public participation and input. Before adoption of the plan a public hearings were held and notice of the meeting

was publicized in the Estherville Daily Newspaper which is considered a regional countywide newspaper with circulation across all of Emmet County. The publication in this regional circulation provided yet another opportunity for public comment and an opportunity for neighboring communities input prior to adoption. A copy of the public notice published for the public hearing prior to adoption of the plan can be seen on page ii of this planning document. Throughout the planning process all meetings were held according to Open Meeting Law Chapter 21, Code of Iowa.

Sample Notice

EMMET COUNTY MITIGATION PLANNING COMMITTEE NOTICE OF PLANNING COMMITTEE MEETING

Emmet County, with assistance from NW IA Planning & Development Commission, is preparing a local Hazard Mitigation Plan for the community. The purpose of this planning process is to identify those natural hazards that pose a threat to the city and ways to mitigate against the loss of life and property from these hazards. Representatives from the school system in Emmet County are strongly encouraged to attend this public meeting and offer input on the hazard mitigation planning process. For more information, or to make arrangements for persons with disabilities or non-English speaking individuals, please contact the Terry Reekers or Aaron Sedey.

The Emmet County Hazard Mitigation Planning Committee will be holding a public meeting at:

Time: 6:30 p.m.

Date: February 28, 2013

Place: Iowa Lakes Community College, Estherville, Room 74

1.3 Opportunity for Neighboring Counties to Participate

All meetings were announced as public meetings and any representative from any neighboring cities or counties was welcomed and encouraged to attend. In an effort to reach out to neighboring counties, Dickinson, Palo Alto and Kossuth counties were contacted and offered an opportunity to assist in the process of drafting this plan. Neither county attended any of the meetings. Below is a sample letter that was sent to these neighboring cities for their consideration.

Mark Hunefeld
1009 Grand Ave
Emmetsburg, IA 50536

SAMPLE LETTER

Dear Mr. Hunefeld,

Emmet County is in the process of completing a Countywide Multijurisdictional Pre-Disaster Hazard Mitigation Plan pursuant to 44 CFR 201.6. According to FEMA regulations Emmet County must provide an opportunity for neighboring counties and cities within and surrounding Emmet County to participate in the planning process and development of this plan and to provide opportunities for the public to comment on the plan during the drafting stage and prior to plan approval. There is no obligation for your county or city to participate in this process. The county is simply fulfilling its obligation to notify and provide the opportunity for neighboring communities to participate in this process. The Emmet County Hazard Mitigation

Committee will be holding its first meeting on February 28, 2013 at Iowa Lakes Community College, room 74 in Estherville, at 6:30 p.m. The Hazard Mitigation Committee anticipates meeting on a monthly basis thereafter until the plan is completed. For more information or to answer questions, you may contact Terry Reekers, Emmet County EMA Coordinator at (712) 362-5702 or Aaron Sedey, Northwest Iowa Planning and Development at (712) 262-7225 ext 138.

Sincerely,
Aaron Sedey
Northwest Iowa Planning and Development
Planner

1.4 Opportunity for School Districts Participation

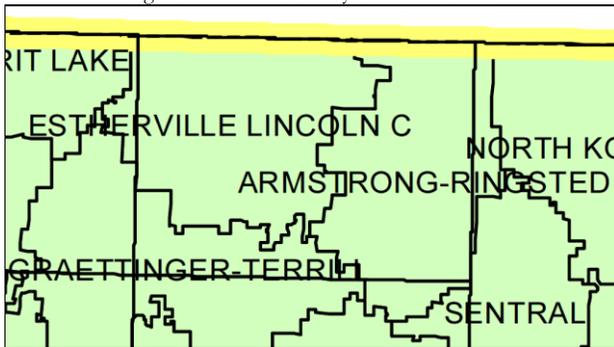
In order to be eligible for mitigation project grants, a college, university, or school district must be an active participant in a FEMA-approved State/Tribal or local plan or have an approved plan of their own that meets the requirements of 44 CFR Part 201. If the entity is participating in a multi-jurisdictional plan, the plan must specifically identify those land areas that pertain to the entity. The plan must also list the entity's specific hazards and include an analysis of those hazards. Any aspects that are unique to the entity relative to the community in which the entity is located must be clearly set forth. After the entity's hazards and risks are identified, at least one specific mitigation action must be developed to reduce the impact of future hazards on the entity. Participation does not have to be direct, but can be indirect; however, the plan must provide a narrative description of this process. Some jurisdictions or entities may lack sufficient personnel to attend planning team meetings. Those jurisdictions can delegate authority to another planning team member. It is the responsibility of the party with delegated authority to ensure that the interests of the delegating jurisdiction or entity are served.

The Emmet County Planning Committee provided an opportunity for the following School Districts:

- Armstrong-Ringsted Community School District
- Estherville Lincoln Central Community School District
- Graettinger – Terril Community School District
- Iowa Lakes Community College

They were reached out to participate in the planning process and mitigation actions of the Emmet County Multijurisdictional Hazard Mitigation Plan. The community college was the only school to participate in this plan. During the update of this plan the school districts will once again be reached out to for participation in this plan.

Figure 1.1 Emmet County School Districts.



**1.5 Emmet County Multijurisdictional Hazard Mitigation Meetings and Minutes
(Public Participation Process)**

Table 1.2						
Date	Meeting Place	Countywide or City	Hours	# People	Hours of In-Kind	Topics Covered
2-28-13 6:30pm	Iowa Lakes Community College Estherville	Countywide	2	13	26	Intro, Hazard Identification, Critical Facilities
3-20-13 6:30pm	Iowa Lakes Community College Estherville	Countywide	2.05	19	38.95	Scoring of hazards, flood/fire areas
5-2-13 6:30pm	Iowa Lakes Community College Estherville	Countywide	1.2	17	20.4	Hazard rankings, develop goals and mitigation actions
5-23-13 6:30pm	Iowa Lakes Community College Estherville	Countywide	2.08	12	24.96	Mitigation priority, STAPLEE, review previous information
6-10-13 5:30pm	Gruver	City	1.25	17	21.25	Review plan, review goals from previous plan
6-11-13 5:30pm	Wallingford	City	1.5	8	12	Review plan, review goals from previous plan
6/18/13 5:30pm	Ringsted	City	1.08	39	42.12	Review plan, review goals from previous plan
6/18/13 7:00pm	Estherville	City	1.25	26	32.5	Review plan, review goals from previous plan
6/24/13 5:30pm	Armstrong	City	1.07	24	25.68	Review plan, review goals from previous plan
6/24/13 7:00pm	Dolliver	City	1.25	14	17.5	Review plan, review goals from previous plan
	<i>Needed - 240</i>				261.36 (Total Useable Hours)	

The minutes and agendas for the previous meetings are in the Appendix. No public comment was received at any of the meetings. All meeting sign-ins are attached in the Appendix.

This document will be a planning effort for Emmet County and participating jurisdictions to address potential and real natural hazards, and the jurisdictions approach and efforts to mitigate against losses from these hazards. This document is intended to serve as a guide and resource document for those persons in Emmet County and participating jurisdiction that are responsible for the daily protection of the community's residents. The following is a table of all participating jurisdictions in the Emmet County Multijurisdictional Hazard Mitigation Plan.

	Abbreviation in the plan	Last Hazard Plan	Update	Represented in Plan
Emmet County	EC	3/9/05 Expired	Yes	Yes
Armstrong	AR	3/9/05 Expired	Yes	Yes
Dolliver	DO	3/14/05 Expired	Yes	Yes
Estherville	ES	3/9/05 Expired	Yes	Yes
Gruver	GR	3/7/05 Expired	Yes	Yes
Ringsted	RI	3/10/05 Expired	Yes	Yes
Wallingford	WA	3/7/05 Expired	Yes	Yes
Iowa Lakes Community College – Estherville	CC	None	No	Yes

1.6 Iowa’s Open Meetings Law – Iowa Code

Iowa’s open meetings law “seeks to assure, through a requirement of open meetings of governmental bodies, that the basis and rationale of governmental decisions, as well as those decisions themselves, are easily accessible to the people.” All actions and discussions at meetings of governmental bodies, whether formal or informal, including work sessions, must be conducted in open session unless exceptions or exemptions are specifically provided by law. “Open session” means a meeting to which all members of the public have access.

The definition of "governmental bodies" includes school boards and any joint board established with other school districts, cities, counties or other units of government. Advisory committees created by statute are subject to the open meetings law whether or not they make recommendations on public policy issues. Advisory committees that are board-created are subject to the open meetings law if they develop and make recommendations on public policy issues. Since it is unlikely that a board would appoint or create an advisory committee that doesn’t make recommendations on public policy issues, it is safe to say that all board-created or board-appointed advisory committees are subject to the open meetings law. Any ambiguity should be resolved in favor of openness. “Meeting” means a gathering in person or by electronic means, formal or informal, of a majority of the members of a governmental body where there is deliberation or action upon any matter within the scope of the governmental body’s policy-making duties. Gatherings for purely social purposes or purely ministerial duties (mandatory acts requiring no discretion or judgment) when there is no discussion of policy, are exempt from the open meetings law ([Iowa Code](#), Chapter 21.2).

This document will be a planning effort for Emmet County and participating jurisdictions to address potential and real natural hazards, and the jurisdictions approach and efforts to mitigate against losses from these hazards. This document is intended to serve as a guide and resource document for those persons in Emmet County and participating jurisdiction that are responsible for the daily protection of the community’s residents.

The Emmet County Multijurisdictional Hazard Mitigation Plan, is a new plan, however there are some elements of the participating jurisdictions that this plan will be an update, as shown in the previous table. If the participating jurisdiction had a previous plan approved by FEMA, even if it is expired or current it will be considered an update this current planning document. So all jurisdictions in Emmet County were contacted and participated in developing with this plan with respects to their own community and those that had a previous plan, they updated and went of their previous information and bring it to the current.

Section 1.7 Record Review

During the development of the Emmet County Hazard Mitigation Plan, existing plans, studies, reports and technical information were reviewed. It is intended that Emmet County Multijurisdictional Hazard Mitigation Plan can be incorporated, where appropriate, into the existing plans in the county. The list below detail documents that were reviewed:

Emmet County:

- Emmet County Comprehensive Land Use Plan
- Emmet County Zoning
- Emmet County Emergency Operations Plan
- County Recovery Plan
- Subdivision Ordinance
- Nuisance Ordinance

Armstrong

- Comprehensive and Landuse Plan
- Capital Improvement Plan
- Subdivision
- Zoning & Subdivision
- Tree Trimming Ordinance
- Nuisance Ordinance

Dolliver

- Dolliver Hazard Mitigation Plan - Expired
- Local Emergency Plan
- Local Recovery Plan
- Building Code
- Tree Trimming Ordinance
- Nuisance Ordinance

Estherville

- Estherville Hazard Mitigation Plan – Expired
- Local Emergency Plan
- Comprehensive Plan
- Tree Trimming Ordinance
- Flood Ordinance
- Zoning Ordinance
- Subdivision Ordinance
- Nuisance Ordinance

Gruver

- Gruver Hazard Mitigation Plan – Expired
- Comprehensive Plan
- Zoning Ordinance
- Nuisance Ordinance

Ringsted

- Ringsted Hazard Mitigation Plan – Expired
- Comprehensive Plan
- Land use Plan
- Local Emergency Plan

- Building Code
- Tree Trimming Ordinance
- Zoning Ordinance
- Subdivision Ordinance
- Nuisance Ordinance
- Storm Water Ordinance

Wallingford

- Wallingford Hazard Mitigation Plan – Expired
- Comprehensive Plan
- Land use Plan
- Zoning Ordinance
- Tree Trimming Ordinance
- Nuisance Ordinance
- Local Recovery Plan
- Flood Ordinance

Iowa Lakes Community College

- Emergency Plan

Previous Disaster Declarations

March 2, 2010 – FEMA DR 1880– 1/19/10-1/26/10

- Severe Winter Storm

February 25, 2010 – FEMA DR 1877– 12/23/09-26/27/09

- Severe winter storm
- Snowstorm

July 2, 1998 – FEMA DR 1230 – 6/13/98-7/15/98

- Severe Storm
- Flooding

July 9, 1993 – FEMA DR 996 – 4/13/93-10/1/93

- Flooding
- Severe storms

December 26, 1991 – FEMA DR 928 – 10/31/91-11/29/91

- Ice Storm

July 12, 1991 – FEMA DR 911 – 6/1/91-6/15-91

- Severe Storm
- Flooding

August 14, 1969 – FEMA DR 269 – 8/14/69-8/14/69

- Heavy Rains
- Flooding

April 25, 1969 – FEMA DR 259 – 4/25/69-4/25/69

- Flooding

April 22, 1965 – FEMA DR 193 – 4/22/65-4/22/65

- Flooding

Section 1.8 Sources

The following resources were used to compile data and complete this plan include: State of Iowa Hazard Mitigation Plan (2010), National Climatic Data Center (NCDC), US Census data, Emmet County Assessor's Office, Hazard Mitigation Plans for the cities of Armstrong, Dolliver, Estherville, Gruver, Ringsted Wallingford, FEMA floodplain maps, Emmet County Zoning Ordinance and Comprehensive Plan, and critical facilities information in participating jurisdictions. These resources were used to compile information on community background information, vulnerability analysis, development of mitigation goals, critical facilities, hazard identification and profiles and historical weather events.

The information and data present in this hazard mitigation plan, was what was used for this plan. It reflects what was used at the time of creation and analysis for this plan. The state plans of 2010 were used in creation of this plan for ideas and information.

Section 1.9 Review of Previous Hazard Mitigation Plans

If the cities or county had a previous hazard mitigation plan it was review at the city meetings to determine what had changed since that plan was approved.

Section 2. Background

2.1 Brief County History

Emmet County was one of 50 new counties set up by Governor Stephen Hempstead on January 15, 1851. It is named after the Irish orator, nationalist and patriot Robert Emmet. He was executed in 1803 for his activity in the Irish rebellion.

The boundaries of the county have stayed the same ever since its establishment in 1851. Since whites were scattered so thinly, it was not until 1856 that the first settlers came to Emmet County. At this time Emmet was attached to Webster County for governmental purposes.

In the winter of 1858-59 the residents of Emmet County decided it was "below their dignity to remain any longer under the jurisdiction of Webster County." A petition was circulated and they were granted separate organization on February 7, 1859.

Two commissioners were entrusted with the selection of the county seat. They surveyed the county and decided on the site of Estherville. Plans were started and a contract was negotiated for the erection of a school house and courthouse. They were to be financed through the sale of the swamp lands that lay within the county. The survey, which was done by the county, was not accepted by the surveyor-general, and the county failed to obtain title to the land. The school house was already completed, but the construction of the courthouse was immediately stopped when it was discovered that the county had no land to transfer to the contractors for payment. The schoolhouse was moved and used as a courthouse until 1876, when it was destroyed by a fire.

Since its conception the county seat at Estherville has not fared well with the residents of the eastern part of the county, who felt it should be more centrally located. They were hesitant due to the cost of building a new courthouse at a new site. However, with the burning of the courthouse in 1876, the opposition to Estherville grew. Petitions were circulated calling for an election on the removal of the county seat. At the same time a remonstrance was filed and submitted to the board.

An election was held on October 14, 1879, with Swan Lake being the alternate site. Swan Lake won the election, and the Board was instructed to move to the new county seat. They refused, and even after a district court action, the county seat was not formally established at Swan Lake until January 9, 1880.

Proceedings were instituted in the courts to test the legality of the first election, and, in 1882, a petition was filed calling for another election. The Board granted it, and on November 7, 1882, a second election was held. This time Estherville won the right to the county seat. In spite of the claim that the workers building the B.C.R. & N. had voted illegally, the election was declared legal, and Estherville again became the county seat on January 15, 1883.

Following this a courthouse was built at Estherville at a cost of \$12,000. It was located on the city square, which was given to the county by the city. In 1882 a long-awaited rail connection was made by the Burlington, Cedar Rapids & Northern Railroad. The first public library was established in 1882 and a Carnegie library was built in 1903.

It was around 1916 when the need for a new courthouse was discovered, but it was not until 1954 that a grand jury voted to recommend that the county build a new courthouse. Plans were drawn up, and bids were let. The Lundquist Construction Company of LeMars was awarded the contract and the cornerstone was laid on June 1, 1957. It was ready for occupation on July 28, 1958, and the wrecking of the old courthouse began.
Source: Dorothy Mergen, Emmet County Recorder

2.2 COUNTY GOVERNMENT OVERVIEW

The Emmet county government serves as the regional government and the provider of essential services to the residents of the county. The county performs many state administrative functions such as issuance of licenses and permits. It also provides public services on a local level such as zoning ordinances, provisions for health and indigent care and the maintenance of county jails.

The Board of Supervisors for Emmet County is elected by residents from within their district. They serve a 4-year term. Meetings are held each Tuesday at 8:30 a.m. in the Emmet County Courthouse. While the County Board of Supervisors is the chief policymaker for the county, the administration of county government is guided by a variety of elective and appointive offices and a number of semi-autonomous boards and commissions.

The Emmet County Attorney is the chief legal representative for the county.

Emergency Management is a coordinated effort, involving local, state, and federal government agencies as well as volunteer organizations and businesses. Within an integrated emergency management framework, these entities assist citizens and their communities to prepare for, respond to, recover from, and eliminate or reduce the effects of natural, man-made, civil, and technological emergencies and disasters. Because disasters start locally, county emergency management coordinators and agencies have a vital role in preparation for, response to, and recovery from disasters - both natural and man-made. County emergency management agencies are the backbone of the state's emergency management system. They provide coordination of local resources and work in partnership with HSEMD to ensure the emergency management and response communities have adequately planned, and are well-equipped, trained, and exercised.

The Iowa Lakes Corridor is a group of four counties creating a unified, targeted approach to developing and branding/marketing the Northwest Iowa region to attract quality new corporate locations and expansions and to attract skilled talent to support business growth. The counties that encompass Iowa Lakes Corridor include: Buena Vista, Clay, Dickinson and Emmet Counties.

2.3 TRANSPORTATION SYSTEM

Highways: State Highways 9 (running east-west), 15 (running north-south) and 4 (running north-south) bisect the county and are the major routes of travel through and within the county. According to the Iowa DOT traffic survey of 2011, which records annual average daily traffic on the heavily used sections of roads and intersections in Emmet County, Highway 9 has traffic counts from 1,370 to 3,500 vehicles per day and Highway 15 has traffic counts from 300 to 1,600 per day. Highway 4 has traffic counts from 570 to 1,690 vehicles per day and Highway 18 has traffic counts from 810 to 2,680 vehicles per day.

Streets and Roads: As of January 1, 2010, according to the Iowa Department of Transportation, Emmet County's secondary road network consists of 644 total miles. Secondary roads are those roads not classified as either a federal or state highway route.

Public Transit Services: The Regional Transit Authority (RTA) known as RIDES is the local transit provider for Emmet County. RIDES is the regional transit provider for a nine (9) county region in Northwest Iowa.

Specifically for Emmet County, RIDES provides fixed route and on demand transit services to several communities in Emmet County. Anyone living in Emmet County can contact the regional transit provider for on-demand taxi service to schedule rides either inter-county or anywhere else within the nine county service area covered by RIDES. Other services provided to Emmet County residents include the Medivan. When

residents of the county need transportation assistance to healthcare appointments, RIDES provides a safe, reliable form of transportation.

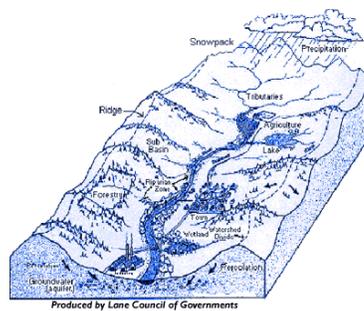
Railroads: The Union Pacific services Emmet County, with two rail lines running west-east through Estherville, Gruver and Armstrong and north-south through Estherville and Wallingford.

Airports: There is one municipal airport in Emmet County: the Estherville Municipal Airport. The Estherville Municipal Airport is located 1.5 miles east of Estherville and considered a general service airport and has an on sight attendant/manager. The airport does not offer commercial passenger service but serves small private aircraft. Its primary hard surface runway is 4,797 feet long and 75 feet wide. According to resource AirNav.com, there are 27 aircraft based at the airport and 26 are single-engine aircraft and one multi engine plane. Operations average 26 per day, with 19% of the aircraft activity being for transient general aviation usage and 81% for local general aviation. These figures were calculated for a 12-month period ending in August of 2011.

2.4 Major Rivers/Watersheds

Watersheds are areas in which all water, sediments and dissolved materials flow or drain into a common river, lake or other body of water. Watersheds may vary in size from the largest river basins to just a few acres, but within their boundaries, all living things are linked by their common watercourse. EPA provides a number of different financial and technical resources to support local watershed protection efforts undertaken by state and tribal governments, public interest groups, industry, academic institutions, private landowners and concerned citizens. Through the EPA’s Office of Water, along with many local groups and other federal agencies can integrate solutions and measure success of these efforts through monitoring and other data gathering.

Figure 2.1 –Watershed Topography



There are four river watersheds in Emmet County, shown opposite (with the county border shown in red): the Blue Earth, Upper Des Moines, East Fork Des Moines and Little Sioux watershed.

Emmet County has several recreational lakes, Okamanpeedan, Swan Lake, High Lake, Ingham Lake, and Cunningham Lake. The major river of Emmet County is the West Fork Des Moines River (Runs through Estherville and on the eastern edge of Wallingford).

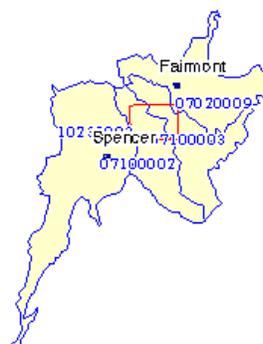


Figure 2.2 – River Watersheds
 (Source: US EPA website:
<http://cfpub.epa.gov/surf/county.cfm>)

2.5 Elevation

The average elevation for Emmet County is between 1240 and 1444 feet above sea level.

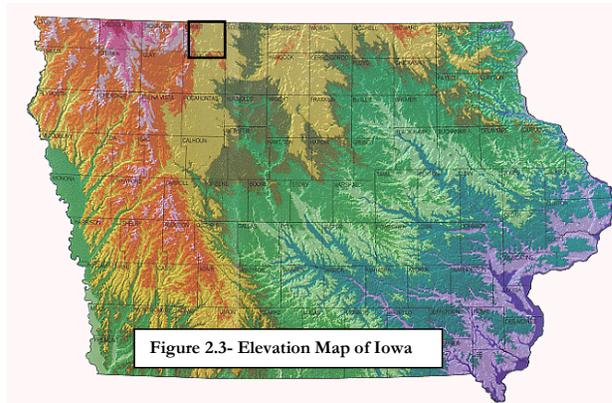


Figure 2.3- Elevation Map of Iowa

2.6 Geology

The geology of Emmet County is almost entirely from the Cretaceous Era (74-102 million years ago). Iowa's geologic history lies buried beneath the ground. The deeper, older and least frequently seen portions of this history consist mostly of sedimentary rocks such as sandstone, limestone, dolomite and shale, which are over 3,000 feet thick in places.

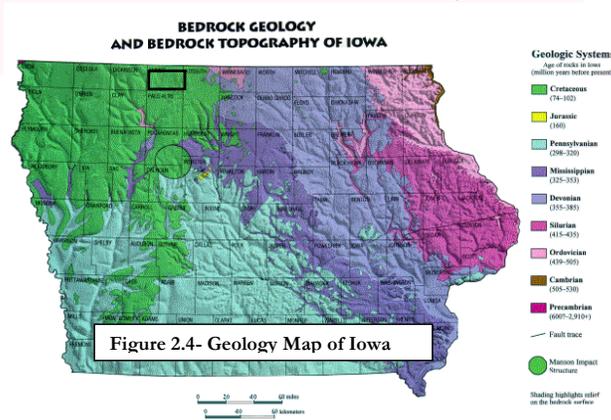


Figure 2.4- Geology Map of Iowa

These rocks originated as layers of loose sediment accumulating in shallow seas and along coastal and floodplain environments that occupied Iowa between 74 million years ago (Cretaceous) and 530 million years. With time, this sediment hardened into rock containing fossil remains of past animal and plant life. Bedrock is occasionally exposed along the state's river valleys, at road cuts, and in quarries. Across much of the state, the bedrock surface is covered with younger glacial-age materials. As a result, much of our information about Iowa's bedrock geology comes from rock samples brought up to the land surface during the drilling of wells. The present land surface across Iowa is dominated by loose materials much younger than the bedrock beneath. These materials consist of sediment originating from ice sheets, meltwater streams, and strong winds during a series of glacial events between 2.5 million and 10,000 years ago (Quaternary). This familiar "dirt"

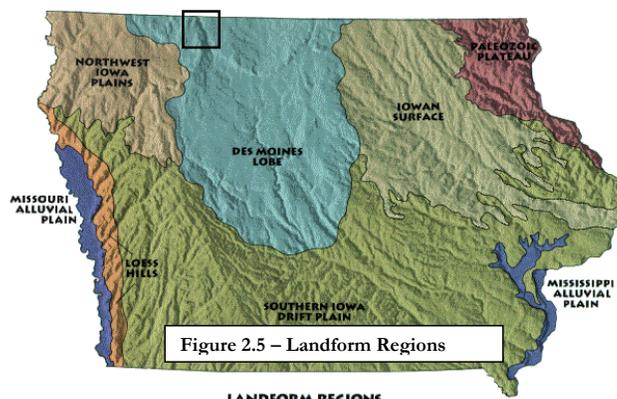


Figure 2.5 - Landform Regions

consists of pebbly clay, sand, gravel, and abundant silt, which over time have weathered into Iowa's productive loamy soils. These easily eroded "Ice Age" deposits account for the gently rolling appearance of much of the Iowa (and Midwestern) landscape.

Differences observed in the landscapes across Iowa are the result of overlapping glacial advances coupled with the effects of erosion and wind. The last glacier to enter the state formed the Des Moines Lobe region (map, right) between 14,000 and 12,000 years ago. Knobby moraine ridges and numerous wetlands are the direct result of a stagnant, disintegrating ice sheet. The rest of Iowa's land surface is formed of much older glacial deposits, left between 2.5 million and 500,000 years ago.

Across southern Iowa, erosion has carved these deposits into steeply rolling, well-drained terrain (Southern Iowa Drift Plain). Across the northern half of Iowa, however, these same deposits were leveled by intense erosion activity during a peak of glacial cold between 21,000 and 16,000 years ago. The result is more gently rolling terrain across the Iowan Surface and Northwest Iowa Plains, which lie on either side of (and beneath) the Des Moines Lobe. About the same time, strong winds swept glacially ground "rock flour" from river floodplains. This airborne silt was deposited as loess across much of the Iowa landscape, and unusually thick deposits along the Missouri Valley in western Iowa became the steep, picturesque ridges of the Loess Hills. Emmet County resides entirely in the Northwest Iowa Plains landform region.

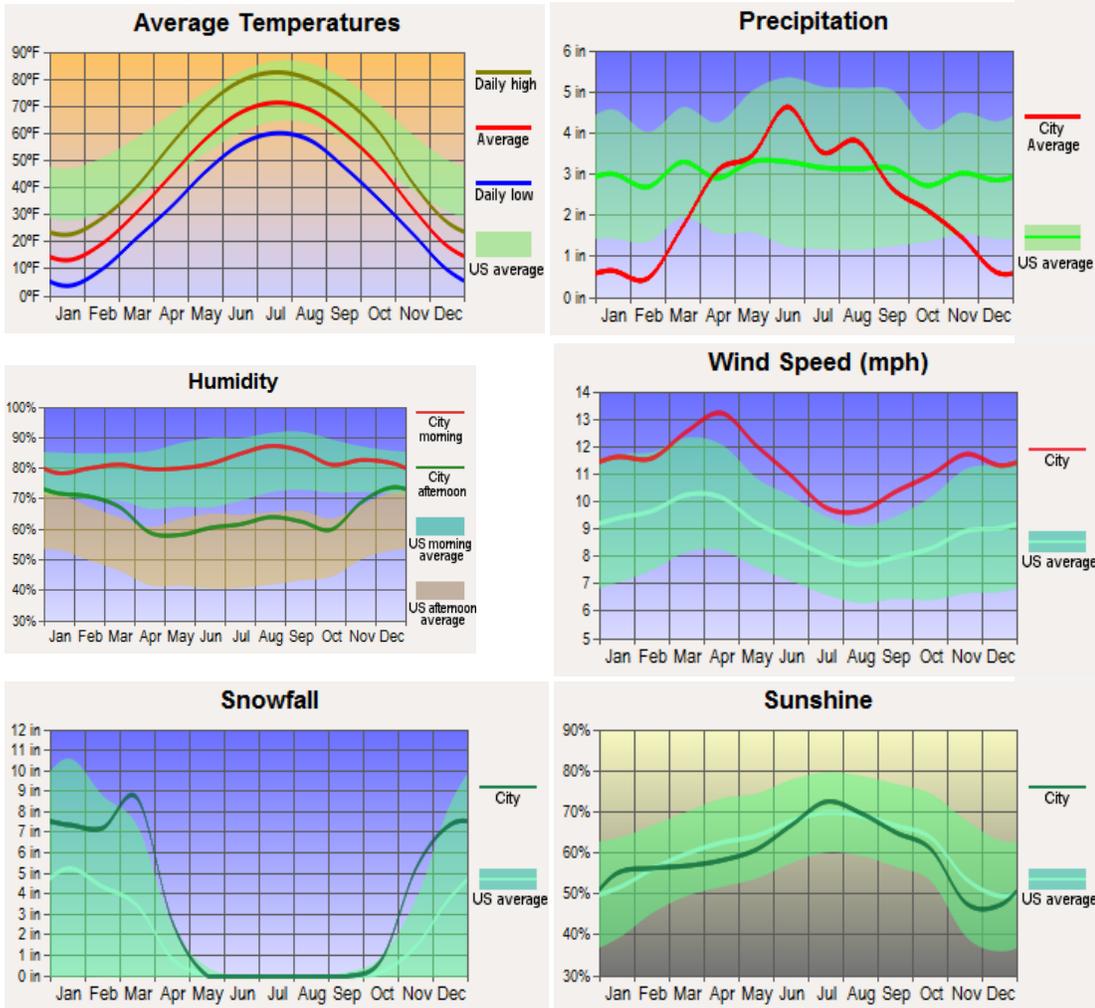
The flow of rivers is the primary geologic process affecting Iowa's landscape today (note valleys on Landform Regions map above). Many valleys, such as the Missouri and Mississippi alluvial plains, are much wider than the rivers within them, which indicates excavation by flood flows during glacial melting. Abundant gravel deposits along the valleys also reflect the power of meltwater to move coarse material. Even modern floods demonstrate how earth materials are eroded from one portion of a valley, sorted by flowing water, and redeposited downstream. Such episodes of sediment transport by rivers are an on-going part of the geologic evolution of Iowa.

Iowa's earth history continues to be shaped by slow, gradual processes as well as by brief, intense events. We live on the surface of a deep geologic inheritance, whose materials and processes -- past, present, and future -- affect the lives of us all.

(Adapted from *Iowa Geology 1997*, Iowa Department of Natural Resources)

2.7 CLIMATOLOGY AND WEATHER

Table 2.1 - Average Climate Data for Estherville/Emmet County, Iowa



Source: <http://www.city-data.com>

2.8 HISTORICAL PLACES AND ARCHEOLOGICAL SITES

Table 2.2 - Historic Places of Emmet County

Brugjeld--Peterson Family Farmstead District (added 2000 - - #00000326)

Also known as **Peterson Point Historical Farmstead**

2349 450th Ave. , Wallingford



Historic Significance: Event, Architecture/Engineering
Area of Significance: Peterson, Peder N., Brugjeld, Peder N.

Cultural Affiliation: Architecture, European, Agriculture
Period of Significance: 1925-1949, 1900-1924, 1875-1899

Owner: **Local**

Historic Function: Agriculture/Subsistence,
Commerce/Trade, Domestic,
Industry/Processing/Extraction

Historic Sub-function: Agricultural Outbuildings, Animal Facility, Manufacturing Facility, Single Dwelling, Specialty Store, Storage

Current Function: Recreation And Culture

Current Sub-function: Museum

Ellsworth Ranch Bridge (added 1998 - - #98000869)

130th St., over E fork of Des Moines R. , Armstrong



Historic Significance: Architecture/Engineering

Area of Significance: King Bridge Co.

Cultural Significance: Other

Period of Significance: Engineering

Owner: 1875-1899

Historic Function: **Local**

Historic Sub-function: Transportation

Current Function: Road-Related

Current Sub-function: Transportation

Estherville Public Library (added 1983 - - #83004728)

613 Central Ave. , Estherville



Historic Significance:

Area of Significance:

Period of Significance:

Owner: **Local**

Historic Function:

Historic Sub-function:

Current Function:

Current Sub-function:

Thomsen Round Barn (added 1986 - - #86001426)
Off IA 15 , Armstrong

Historic Significance:Event, Architecture/Engineering
Area of Significance:Unknown
Period of Significance:Other
Owner:Engineering, Agriculture
Historic Function:1900-1924
Historic Sub-function:**Private**
Current Function:Agriculture/Subsistence

Source: National Register of Historic Places: <http://www.nationalregisterofhistoricplaces.com/LA/Emmet>

2.9 POPULATION AND DEMOGRAPHICS

Population analysis plays a critical role in the planning process. Analysis of past trends and current population structure is important in making future population projections. Those projections, along with information about population characteristics such as age, are fundamental in considering the need for current and future mitigation activities and infrastructure improvements. This section will examine past trends, future projections, and current structure, and discuss their impact on the future of Emmet County.

Population Trends (History and Future Projections)

Shifts and growth in population play a critical role in the planning process. Analysis of past trends and current population structure is important in making future population projections. Those projections, along with information about population characteristics such as age and household size, are fundamental in considering the need for future infrastructure improvements and the need for the development of residential, commercial and industrial areas. This section will examine past trends, current structure, future projections, and discuss their impact on the future of Emmet County.

Emmet County's first recorded census was in 1860. Its population was only 108. From there the county population grew rapidly until 1900 and then steadily until 1960, when its highest population was recorded at 14,871. The population remained fairly steady through the 1920's, 1930's and 1940's. Since 1960, the county has experienced a slight decrease every decade.

Table 2.3 - Historic Population Trends, Emmet County

YEAR	1900	1910	1920	1930	1940	1950
POPULATION	9,936	9,816	12,627	12,856	13,406	14,102
YEAR	1960	1970	1980	1990	2000	2010
POPULATION	14,871	13,992	13,339	11,952	11,027	10,302

As of the 2010 Census, Emmet County has a total population of 10,302 persons, of which 2,563 are rural residents. From 2000 to 2010, the rural unincorporated population of Emmet County decreased from 2,563 to 2,237, a difference of 326 residents and a 12.7 percent decrease. This trend is typical of most other counties across northwest Iowa who are also experiencing a loss of rural population.

Of the total population, 49.9 percent, or 5,143, are male, while 50.1 percent, or the remaining 5,159 residents, are female. This proportion of males to females is typical of the area due to the longer life expectancy of females.

The median age of 41.0 years for Emmet County residents is slightly higher than that of the State of Iowa, which is at 38.1. The aging factor in Emmet County is also unfortunately reflected in the declining enrollment of the local school districts. Nearly 18.82% percent of the county's 2010 population or 1,939 persons meet the U.S. Census' definition of elderly, which includes persons aged 65 and older. This demonstrates a clear need for special consideration when providing future county services and planning future land use growth decisions.

The 2010 Census for Emmet County indicated that 93.1 percent of the county's population were identified as White, while 69 residents were American Indian, 65 individuals are Black or African American and 44 more residents are identified as Asian. According to statistics, there are 158 persons that declared "two or more races". Of all races, 763 persons in Emmet County declared they were of Hispanic or Latino decent constituting 7.4% of the total population. These numbers of minorities are important when determining the

services that are to be provided. As these segments of the population continue to grow, the county's policies and goals with respect to personnel and service provisions may need to be evaluated and adjusted.

While many Iowa counties have seen a shift in population from rural areas to urban centers in the county, Emmet County has seen a gradually decrease in population in both sectors. Emmet County's total population has decreased approximately 22.8% since 1980, while the rural population of Emmet County has seen a 37.8% decrease in population since 1980. Overall, the city totals for Emmet County have decreased approximately 17% since 1980. In this case, as farm sizes grow and more large corporate farms emerge, the population not only has shifted away from rural townships.

Table 2.4 - Population Trends of Communities in Emmet County

City	1980	1990	2000	2010	2020 (est.)	2030 (est.)
Armstrong	1153	1025	979	926	873	845
Dolliver	125	103	77	66	78	76
Estherville	7518	6720	6656	6360	5838	5651
Gruver	145	102	106	94	95	92
Ringsted	557	481	436	422	404	391
Wallingford	256	235	210	197	192	185
Total City	9754	8666	8464	8065	7479	7240
Rural	3585	3286	2563	2237	2471	2392
Total County	13,339	11,952	11,027	10,302	9,950	9,632

Source: US Census Bureau, 1980, 1990, 2000 Census. Total county estimates from Woods and Poole, Inc.

Note: Individual city estimates, total city estimates and rural estimates for 2020 were calculated using average percentages of county total estimates. For example if the city of Armstrong's population in 1980, 1990, 2000 and 2010 represented approximately 8.8% of the total county population, then the estimated population for 2010 and 2020 were calculated using 2% of the projected total county population for those years.

Table 2.5 – Estimated Population & Persons per Household

YEAR	EMMET COUNTY POPULATION	PERSONS PER HOUSEHOLD FOR EMMET COUNTY
1970	13,992	3.11
1980	13,339	2.69
1990	11,952	2.49
2000	11,027	2.36
2010	10,302	2.30
2015	10,115	2.18
2020	9,950	2.14
2025	9,632	2.11
2030	9,473	2.08

Source: Census Data 1970- 2010; 2015 to 2030 are projections extrapolated from Woods & Poole Inc

Of particular interest is the declining size of households in Emmet County. Between 1970 and 2010 the average persons per households has decreased from 3.11 to 2.30. Future projections indicate a continuing trend in declining household size, down to a projected low of 2.08 in 2030. The decline in household size is typically attributed to an aging population, the decline in family size, and an increase in the divorce rate, which can create additional households with no increase in population. With a projected declining household size, and a projected decreasing population, this may have a complex impact on predicting the number of future housing units required in future years to accommodate the county's housing needs. As experienced in recent trends throughout Emmet County, Woods and Poole data predicts the county's population will continue to decrease, with a population estimate of 9,473 by the year 2030.

2.10 CURRENT POPULATION STATISTICS

As of the census of 2010, there are 10,302 people, 4,236 households, and 2,684 families residing in the county. The population density is 26/square mile. The racial makeup of the county is 93.1% White, 0.6% Black or African American, 0.7% Native American, 0.4% Asian, 0.0% Pacific Islander, 1.5% from other races, and 0.6% from two or more races. 7.4% of the population is Hispanic or Latino.

2.11 HOUSING CHARACTERISTICS AND OCCUPANCY

There were 4,236 housing units in Emmet County according to the 2010 Census. Those households out of which 25.5% had children under the age of 18 living with them, 50.3% were married couples living together, 8.4% had a female householder with no husband present, and 36.6% were non-families, 24.6% of all households were made up of individuals and 31.7% had someone living alone who was 65 years of age or older. The average household size was 2.30 and the average family size was 2.88.

The County's population is comprised of 660 persons (6.40%) age 5 and under, 2,120 persons (20.58%) ages 5 to 19 years of age, 5,583 persons 20 to 64 years of age (54.19%), and 1,939 persons (18.82%) who are 65 years of age or older. The median age was 41 years.

Geography	Age	Male	Female	Total (Sex)
Emmet	0 to 4 years	346	314	660
	5 to 9 years	317	325	642
	10 to 14 years	304	298	602
	15 to 19 years	432	444	876
	20 to 24 years	368	243	611
	25 to 29 years	307	267	574
	30 to 34 years	296	259	555
	35 to 39 years	266	257	523
	40 to 44 years	271	248	519
	45 to 49 years	332	345	677
	50 to 54 years	391	391	782
	55 to 59 years	395	358	753
	60 to 64 years	297	292	589
	65 to 69 years	224	231	455
	70 to 74 years	199	216	415
	75 to 79 years	149	203	352
	80 to 84 years	132	195	327
	85 years and over	117	273	390
	Total (Selected Age)	5,143	5,159	10,302

Section 3. Identifying Hazards

There are many different natural events such as floods, tornadoes, thunderstorms and extreme heat incidents that have adverse effects on the public safety and welfare of a community. The Hazard Analysis and Risk assessment focuses your attention on areas most in need by analyzing the populations and facilities that are most vulnerable to natural and man-made hazards and to what extent damages may occur. The risk assessment identifies how people properties and structures will be damaged due to a hazardous event. If the hazard can harm structures and people they are considered vulnerable. Finding weak points in the system include identifying building types that are vulnerable to damage and anticipating the loss in high risk areas. This will help the community to decide what mitigation efforts are required or should be undertaken and how to implement the selected activities. A community can best prepare for mitigation by understanding the following:

- What hazards is your community susceptible to;
- What these hazards can do to physical, social, and economic resources;
- Which areas are most vulnerable to damage from these hazards; and
- The resulting cost of damages or cost avoided through future mitigation projects.

The first step in the analysis is to identify all hazards that have occurred or that could potentially affect the community. The list of potential hazards that can occur in Iowa and examined in the Plan comes from the 2010 State of Iowa Hazard Mitigation Plan. The State of Iowa 2010 Plan identifies 16 natural hazards that may affect all or parts of the State of Iowa. (The Emmet County Hazard Mitigation Plan, specifically this section, addresses 13 of the 16 identified natural hazards identified in the State of Iowa) This identification process allows the local planning committee to examine the statewide listing of all hazards and make a local determination of which hazards have already affected Emmet County, which hazards may affect the county in the future and which hazards will likely not impact the county at all.

The planning committee's next step was to profile each hazard that was identified from the first step. Through the profiling process the planning committee discussed historical occurrences, the probability of the hazard occurring again in the future, the vulnerability of the population that will be affected by the hazard, the maximum geographic extent, the severity of the hazard in terms of injuries/fatalities, personal property, and infrastructure, and the speed of onset or warning time available before the hazard occurs. Table 3.1 shows which hazards were identified as either have occurred or potentially could occur in your Emmet County, and how each of the hazards was profiled.

The first step in the analysis is to identify all hazards that have occurred or that could potentially affect the community. The planning committee's next step was to profile each hazard that was identified from the first step. Through the profiling process the planning committee discussed probability of occurrence in any given year; magnitude and severity of impact in terms of life, property, infrastructure, etc; amount of warning time available before the hazard occurs; duration of the hazard's impact on the state.

Table 3.1 Identified Hazards

Natural Hazards			
Has Occurred	Potentially Could Occur	Unlikely to Occur	Hazard
X			Drought
		X	Earthquake
		X	Expansive Soils
X			Extreme Heat
X			Flash Flood
X			Hailstorm
X			Landslide
X			River Flood
X			Severe Winter Storm
		X	Sinkhole
X			Thunderstorm and Lightning
X			Tornado
X			Windstorm
	X		Dam Failure
	X		Levee Failure (Includes Over Topping)
X			Grass or Wildland Fire

The previous table again shows the 16 natural hazards that can occur in Iowa, as indicated in the State of Iowa Hazard Mitigation Plan. Of the 16 hazards there were three that did not receive a: has occurred or could occur in any of the jurisdictions. There for those three will not be profiled, which are earthquake, expansive soils and sinkhole. The Planning Committees determined that because they pose little or no threat or possibility to occur within the community or jurisdiction. These three hazards will no longer be addressed or discussed throughout the remainder of this plan. The following are the hazards that were decided by the planning committees *unlikely to occur* in the community, along with why each of these identified hazards will not occur.

- *Earthquake* – The information and data presented below are the supporting reasons why the all planning committees decided to eliminate this hazard for this plan. The planning committees recognizes certain portions of southern and central Iowa have the potential to be affected by earthquakes, however the planning committee also believes the potential for negative effects in Emmet County to be minuscule, if any. According to the Iowa Hazard Mitigation Plan, the state is located in low risk Seismic Zones 0 and 1. Although this does not mean an earthquake will not happen in Iowa, it does provide a relatively assured measure that the vulnerability of cities in Iowa, especially northwest Iowa is considerably low. Iowa has only experienced 13 total earthquakes in the past 175 years, most of which have occurred along the Mississippi corridor (eastern Iowa) and in southern Iowa. In the limited possibility that an earthquake hits northwest Iowa, property damage would be minimal. Again, according to data from the Iowa State Hazard Mitigation Plan, seismologists attempt to forecast earthquakes. Professionals estimate a 90% chance of a magnitude 6.0 earthquake occurring within the New Madrid Fault Zone by the year 2040. This magnitude of earthquake in Missouri would create an estimated 4.0 magnitude or less effect in Iowa, resulting in minimal damage and little or no fear.
- *Expansive Soils* – The local planning committees determined that this hazard would be “unlikely to occur” in the Emmet County region and the affects would be negligible. The information and data presented below are the supporting reasons why the local planning committee decided to eliminate this hazard in the updated plan. According to the NRCS (Natural Resource Conservation Service) Soil Survey for Emmet County, Iowa, there are very few soils within the Emmet County that show properties conducive to extreme expansive properties. Additionally, planning committees and community leaders report that no history of expansive soils or incidents relating to any damages or problems resulting from soil subsidence.

- *Sinkholes* – The local planning committees determined that this hazard would be “unlikely to occur” or unlikely to affect inhabitants in a negative way in the Emmet County region and the affects would be negligible. There have been no recorded events in Emmet County, the committee does not wish to look into this hazard until it occurs or until there are proven methods to prove when and where sinkholes are going to occur. They will reassess this hazard in their next update.

The Planning Committee determined that it would be best to leave all other potential hazards up for discussion and then, if through further research or discussion hazards that were not seen as a threat to Emmet County could be eliminated by the team.

The remaining relevant hazards were profiled in the following categories: probability, magnitude/severity, warning time and duration. The numbers in each row were summarized, and then ranked, with the highest numbers being the most prevalent hazards.

The hazard scoring and rankings were completed by the planning committee for the county. Each individual city was provided with the county hazard rankings and relevant hazard information; and asked to draw upon their local experiences and knowledge to determine what hazards pose the highest risk to them.

Section 4. Profiling Hazards and Risk Assessment

Hazard Scoring Methodology

The assessment of the risk to people and property in Iowa from a variety of hazards requires a tremendous amount of data from all levels of government and the private sector. To accomplish this task and to do it as objectively as possible, a number of factors were taken into account:

- Probability of occurrence in any given year;
- Magnitude and Severity of impact in terms of life, property, infrastructure, etc;
- Amount of warning time available before the hazard occurs;
- Duration of the hazard's impact on the state.

The economic impact of disasters is a relatively new area of record-keeping and is generally restricted to major disasters involving both state and federal funding. Smaller, less significant events often do not reflect the economic impact of the incident. For these smaller events, there is a greater reliance on local information and records of impacts.

Members of the State Hazard Mitigation Team were asked to discuss each of the hazards. They were also asked with respect to the agency's goals and mission for their expertise and input as to applicable hazards considered in the hazard mitigation plan using the updated methodology for scoring.

This hazard analysis seeks to strike a balance between evaluation criteria, for example, the evaluation of low probability-high impact events versus high probability-low impact events. Each category of a particular hazard is rated on a scale of one (1) through four (4). Totaling and averaging categorical ratings will provide an overall rating for each hazard (for a total average in the range of 1 to 4). The hazard worksheet score was recorded in the worksheet score column of the composite scoring worksheets.

It was important for the assessment team to score each hazard as a single event. Only impacts from that particular hazard were to be considered in the analysis. The effects of applying an additional methodology to analyze the effects of cascading hazards were considered for application in the new methodology but it was determined that this added analysis yielded little to no effect on the overall scoring of hazards and analysis of vulnerability to individual hazards.

A scale of one (1) through four (4) was used in all of the scoring guide tables outlined on the following pages section because of the large variation in historical occurrences and probabilities, percentages of vulnerabilities and spatial extent, the number of casualties, or the value of property damaged. Often this data was not available, or would have been impossible to extract from aggregate data. Using this scale provided the best option for comparison of vastly different types of hazards. The use of overlapping values between each of the categories was analyzed but decided against due to the nature of including a proper narrative with the scoring. Other hazard analyses across the country have used the "high, medium, and low" criteria to score the categories. Using a quantifiable system gives more detail and still allows for adjustments where necessary.

The idea of weighting certain categories relative to the other categories was discussed and considered. It was determined that Iowa would use a weighting criteria to allow for state priorities to be reflected in the final scoring of the hazards and to allow for a higher priority to be placed on hazards that have a higher occurrence in the state and have a high potential for adverse impact. Using the four elements described above the formula the SHMT determined to be the most effective for the Iowa risk analysis was determined with the justification that Iowa's priorities in criteria considers the probability and historical occurrence of a hazard is the highest priority for mitigation with the duration that the hazard affects Iowa being the lowest. The formula used for this risk assessment is as follows:

(Probability x .45) + (Magnitude/Severity x .30) + (Warning Time x .15) + (Duration x .10) = Final Hazard Assessment Score

Probability

This is a measure of how many times has this hazard occurred in the past. Each hazard may or may not have a comprehensive documented historical record. Local, state, and federal government agencies have increasingly improved record-keeping with respect to incidents, accidents, and disasters which affect people and property. The National Weather Service, a division of the National Oceanic and Atmospheric Administration (NOAA) maintains a thorough history of weather events, as does the State Climatologist’s office. Agencies in recent years have initiated record-keeping efforts in the areas of hazardous materials incidents, transportation accidents, and fires.

The probability score reflects the likelihood of the hazard occurring again in the future, considering both the hazard’s historical occurrence and the projected likelihood of the hazard occurring in any given year. Many times the historical occurrence can be extrapolated into the future using best available data, but others, due to the nature of the hazard are more difficult to estimate the probability of future occurrence. If a hazard or its impacts have been mitigated against, the probability of future occurrence decreases. Conversely, hazards that have not occurred in the past may present themselves to the community in the future.

Probability: Reflects the likelihood of the hazard occurring again in the future, considering both the hazard’s historical occurrence and the projected likelihood of the hazard occurring in any given year		
Score	Description	
1	Unlikely	Less than 10% probability in any given year (up to 1 in 10 chance of occurring), history of events is less than 10% likely or the event is unlikely but there is a possibility of its occurrence
2	Occasional	Between 10% and 20% probability in any given year (up to 1 in 5 chance of occurring), history of events is greater than 10% but less than 20% or the event could possibly occur
3	Likely	Between 21% and 33% probability in any given year (up to 1 in 3 chance of occurring), history of events if greater than 20% but less than 33% or the event is likely to occur
4	Highly Likely	More than 33% probability in any given year (event has up to a 1 in 1 chance of occurring), history of events is greater than 33% likely or the event is highly likely to occur

Magnitude / Severity

The magnitude of the impact of a hazard event (past and perceived) is related directly to the extent that hazards affect the County and is measured using technical measures specific to the hazard (ideally determined with standard scientific scales). This is also a function of when the event occurs (year-round, seasonal), the location affected (both geographically and non-geographically determined), the resilience of the community, and the effectiveness of the emergency response and disaster recovery efforts.

Magnitude / Severity: Assessment of severity in terms of injuries and fatalities, personal property, and infrastructure and the degree and extent with which the hazard affects the County.		
Score	Description	
1	Negligible	• Less than 10% of property severely damaged, shutdown of facilities and services for less than 24 hours, and/or injuries/illnesses treatable with first aid
2	Limited	• 10% to 25% of property severely damaged, shutdown of facilities and services for more than a week, and/or injuries/illnesses that do not result in permanent disability
3	Critical	• 26% to 50% of property severely damaged, shutdown of facilities and services for a least 2 weeks, and/or injuries/illnesses that result in permanent disability
4	Catastrophic	• More than 50% of property severely damaged, shutdown of facilities and services for more than 30 days, and/or multiple deaths

Warning Time

The speed of onset is the amount of warning time available before the hazard occurs. This should be taken as an average warning time. For many of the atmospheric natural hazards there is a considerable amount of warning time as opposed to the human caused accidental hazards that occur instantaneously or without any significant warning time.

Warning Time: Rating of the potential amount of warning time that is available before the hazard occurs	
Score	Description
1	More than 24 hours warning time
2	12 to 24 hours warning time
3	6 to 12 hours warning time
4	Minimal or no warning (Up to 6 hours warning)

Duration

This consists of the typical amount of time that the jurisdiction is impacted by the hazard. As an example, a snowstorm will likely last several hours, whereas a lightning strike would last less than a second.

Duration: A measure of the duration of time that the hazard will affect the County.	
Score	Description
1	Less than 6 hours
2	Less than 1 day
3	Less than 1 week
4	More than 1 week

The scoring was based on the scoring criteria from the previous criteria tables. Scores for each jurisdiction that identified the hazard is shown on the first table of each hazard. The scoring is reflected by the scoring criteria and the determination of the planning committee. Data is from the NCDL that present in the plan is the data that was available when the committee was determining their scores.

Table 4.1 – Scoring hazards for Emmet County

	Probability Score		Magnitude Severity Score		Warning Time Score		Duration Score		Score					
Drought	2	x	0.45	2	x	0.3	1	x	0.15	4	x	0.1	=	2.05
Extreme Heat	4	x	0.45	2	x	0.3	1	x	0.15	4	x	0.1	=	2.95
Flash Flood	3	x	0.45	2	x	0.3	2	x	0.15	3	x	0.1	=	2.55
Hailstorm	4	x	0.45	2	x	0.3	3	x	0.15	1	x	0.1	=	2.95
Landslide	1	x	0.45	1	x	0.3	4	x	0.15	1	x	0.1	=	1.45
River Flood	4	x	0.45	2	x	0.3	2	x	0.15	4	x	0.1	=	3.1
Severe Winter Storm	4	x	0.45	3	x	0.3	2	x	0.15	4	x	0.1	=	3.4
Thunderstorm and Lightning	4	x	0.45	2	x	0.3	2	x	0.15	2	x	0.1	=	2.9
Tornado	2	x	0.45	2	x	0.3	4	x	0.15	1	x	0.1	=	2.2
Windstorm	4	x	0.45	3	x	0.3	4	x	0.15	1	x	0.1	=	3.4
Dam Failure	1	x	0.45	1	x	0.3	4	x	0.15	1	x	0.1	=	1.45
Levee Failure	1	x	0.45	1	x	0.3	4	x	0.15	4	x	0.1	=	1.75
Grass or Wildland fire	4	x	0.45	2	x	0.3	4	x	0.15	2	x	0.1	=	3.2

4.2 – Hazard Ranking	
1	Severe Winter Storm
2	Windstorm
3	Grass and Wildland Fire
4	River Flood
5	Hailstorm
6	Extreme Heat
7	Thunderstorm and Lightning
8	Flash Flood
9	Tornado
10	Drought
11	Levee Failure
12	Landslide
13	Dam Failure

Source: Emmet County Planning Committee

**This hazard scoring, which was completed by the Emmet County Hazard Mitigation Planning Team, was used for all jurisdictions in Emmet County. The hazard ranking comprised from the scoring was given to each jurisdiction and the jurisdictions identified which hazards could impact them and re-ranked the hazards according to their historical knowledge of their community.*

Table 4.3 - Jurisdiction Abbreviation In This Plan					
Emmet County	=	EC	Gruver	=	GR
Armstrong	=	AR	Ringsted	=	RI
Dolliver	=	DO	Wallingford	=	WA
Estherville	=	EV			

Table 4.4 – Hazards selected for jurisdictions

	Armstrong	Dolliver	Estherville	Gruver	Ringsted	Wallingford	Unincorporated Emmet County	Iowa Lakes Community College
Drought	X	X	X	X	X	X	X	X
Extreme Heat	X	X	X	X	X	X	X	X
Flash Flood	X	X	X	X	X	X	X	X
Hailstorm	X	X	X	X	X	X	X	X
Landslide			X				X	
River Flood	X		X			X	X	
Severe Winter Storm	X	X	X	X	X	X	X	X
Thunderstorms and Lightning	X	X	X	X	X	X	X	X
Tornado	X	X	X	X	X	X	X	X
Windstorm	X	X	X	X	X	X	X	X
Dam Failure	X		X				X	
Levee Failure			X		X	X	X	
Grass/Wildland Fire	X	X	X	X	X	X	X	

Drought

4.1.1 Definition and description:

Drought is defined as a period of prolonged lack of precipitation for weeks at a time producing severe dry conditions. There are four (4) types of drought conditions relevant to Iowa:

- Meteorological drought, which refers to precipitation deficiency;
- Hydrological drought, which refers to declining surface and groundwater supplies;
- Agricultural drought, which refers to soil moisture deficiencies; and
- Socioeconomic drought, which refers to when physical water shortages begin to affect people.

The highest occurrence of drought conditions with recorded events in Iowa are associated with agricultural and meteorological drought as a result of either low soil moisture or a decline in recorded precipitation.

Droughts can be spotty or widespread and last from a few weeks to a period of years. A prolonged drought can have a serious impact on a community's water supply and economy. Increased demand for water and electricity may result in shortages of resources. Moreover, food shortages may occur if agricultural production is damaged or destroyed by a loss of crops or livestock. While droughts are generally associated with extreme heat, droughts can and do occur during cooler months.

4.1.2 Hazards Identified by Jurisdiction:

The table below shows which jurisdictions identified drought as a hazard they are susceptible to.

	Unincorporated Emmet County	Armstrong	Dolliver	Estherville	Gruver	Ringssted	Wallingford	Iowa Lakes College
Drought	X	X	X	X	X	X	X	X

4.1.3 Probability:

The committee determined that the 'Occasional' drought would affect the county. They concluded that there could be a 1 in 5 chance to occur in any given year.

Table 4.5 Iowa Drought Events. Source Iowa State Plan.

Drought Period	Geographic Impact
8/1/95 – 8/31/95	Statewide
7/20/99 – 7/30/99	24 percent of the state
11/1/99 – 11/30/99	11 percent of the state
12/1/99 – 12/31/99	11 percent of the state
2/1/00 – 2/29/00	11 percent of the state
3/1/00 – 3/31/00	11 percent of the state
4/1/00 – 4/30/00	11 percent of the state
8/14/00 – 8/31/00	32 percent of the state
9/1/00 – 9/6/00	32 percent of the state
9/1/01 – 9/23/01	51 percent of the state
9/1/03 – 9/31/03	51 percent of the state
7/1/05 – 7/31/05	20 percent of the state
8/1/05 – 8/31/05	20 percent of the state
9/1/05 – 9/30/05	20 percent of the state
10/1/05 – 10/31/05	20 percent of the state
11/1/05 – 11/30/05	18 percent of the state
12/1/05 – 12/31/05	18 percent of the state
1/1/06 – 1/31/06	18 percent of the state
2/1/06 – 2/28/06	17 percent of the state
3/1/06 – 3/31/06	16 percent of the state

During the period from 1980 to 2009, there was \$2.010 billion in crop damages resulting from drought periods. The most common trend was the consistency of drought periods during the months of July through August; out of the twenty (20) periods, nine (9) of them were between July through August. While some may have been more severe than others, agricultural areas were impacted much more than the metropolitan areas where impacts were indirect.

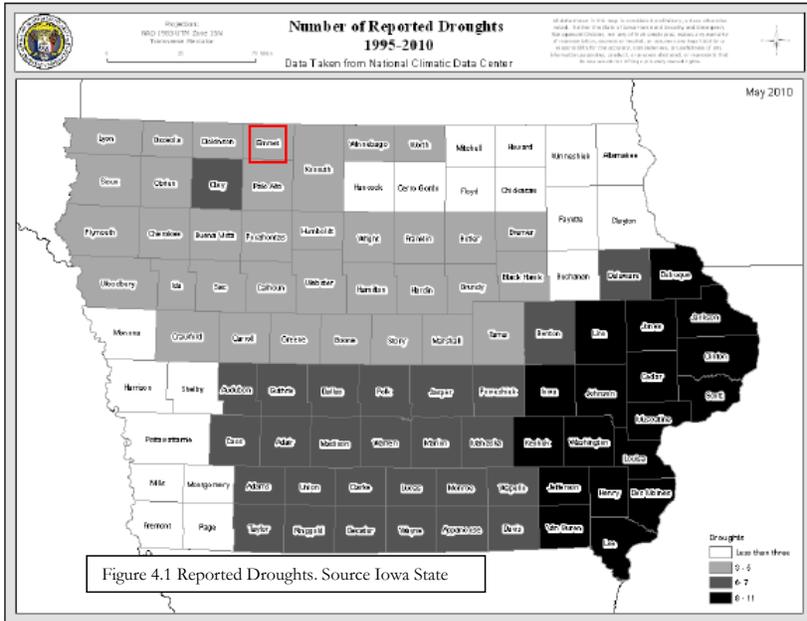


Figure 4.1 Reported Droughts. Source Iowa State

All jurisdictions determined there have been less than 4 occurrences that have affected them in a negative impact. The NCDC data shows 6 different events, however all jurisdictions concluded that four were one continuous event.

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	12.650M	107.350M
EMMET (ZONE)	EMMET (ZONE)	IA	08/01/2001	00:00	CST	Drought		0	0	0.00K	11.350M
EMMET (ZONE)	EMMET (ZONE)	IA	08/01/2003	00:00	CST	Drought		0	0	12.650M	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	07/01/2012	00:00	CST-6	Drought		0	0	0.00K	90.000M
EMMET (ZONE)	EMMET (ZONE)	IA	08/01/2012	00:00	CST-6	Drought		0	0	0.00K	6.000M
EMMET (ZONE)	EMMET (ZONE)	IA	09/01/2012	00:00	CST-6	Drought		0	0	0.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	10/01/2012	00:00	CST-6	Drought		0	0	0.00K	0.00K
Totals:								0	0	12.650M	107.350M

Figure 4.6 - Source: National Climate Data Center

4.1.4. Magnitude/Severity:

Droughts are considered to have limited magnitude and severity. That 10%-25% of property severely damaged, shutdown of facilities and services for a week or more, and/or injuries/illnesses that do not result in permanent disability

The 2010 State of Iowa Hazard Mitigation Plan estimates Emmet County, has an annual estimation loss of \$2,033,031.15.00 due to drought.

4.1.5. Warning Time:

Drought events often occur with more than 24 hours warning time. A drought is an event that occurs over time due to lack of precipitation. Therefore, there would be signs more than 24 hours ahead of time that a drought could occur.

4.1.6. Duration:

The duration of a drought is more than 1 week. Typically, droughts will last for long periods of time, but that situation could change quickly if there is precipitation. Factors that also determine the duration is how severe the drought is and how long the areas has gone without precipitation.

4.1.7. Hazard Total Score: 2.05

4.2 Extreme Heat

4.2.1 Definition and description:

Conditions for extreme heat are defined by summertime weather that is substantially hotter and/or more humid than average for a location at that time of year. This includes temperatures (including heat index) in excess of 100 degrees Fahrenheit or at least three (3) successive days of 90+ degrees Fahrenheit. A heat advisory is issued when temperatures reach 105 degrees and a warning is issued at 115 degrees. The heat index is a number in degrees Fahrenheit that tells how hot it really feels when relative humidity is added to the actual air temperature. Exposure to full sunshine can increase the heat index by at least 15 degrees. Extreme heat can impose stress on humans and animals. Heatstroke, sunstroke, cramps, exhaustion, and fatigue are possible with prolonged exposure and/or physical activity due to the body's inability to dissipate the heat. Urban areas are particularly at risk because of air stagnation and large quantities of heat absorbing materials such as streets and buildings. Extreme heat can also result in distortion and failure of structures and surfaces such as roadways and railroad tracks.

4.2.2 Hazards Identified by Jurisdiction:

The table below shows which jurisdictions identified Extreme Heat as a hazard they are susceptible to.

	Unincorporated Emmet County	Armstrong	Dolliver	Estherville	Gruver	Ringssted	Wallingford	Iowa Lakes College
Extreme Heat	X	X	X	X	X	X	X	X

4.2.3 Probability:

The planning committee determined that it is 'Highly Likely' that an extreme heat event will occur in the next year. That is a 1 in 1 chance to occur on any given year. The NCDC listed several events of extreme heat for Emmet County, but when it was to be downloaded from their site it was removed from their website. Events will be included in future updates. What follows is supporting information on extreme heat events.

Table 4.7 Heat Index Chart

HEAT INDEX °F													
Temp.	RELATIVE HUMIDITY												
	40%	45%	50%	55%	60%	65%	70%	75%	80%	85%	90%	95%	100%
110°	136												
108°	130	137											
106°	124	130	137										
104°	119	124	131	137									
102°	114	119	124	130	137								
100°	109	114	118	124	129	136							
98°	105	109	113	117	123	128	134						
96°	101	104	108	112	116	121	126	132					
94°	97	100	103	106	110	114	119	124	129	135			
92°	94	96	99	101	105	108	112	116	121	126	131		
90°	91	93	95	97	100	103	106	109	113	117	122	127	132

88°	88	89	91	93	95	98	100	103	106	110	113	117	121
86°	85	87	88	89	91	93	95	97	100	102	105	108	112
84°	83	84	85	86	88	89	90	92	94	96	98	100	103
82°	81	82	83	84	84	85	86	88	89	90	91	93	95
80°	80	80	81	81	82	82	83	84	84	85	86	86	87

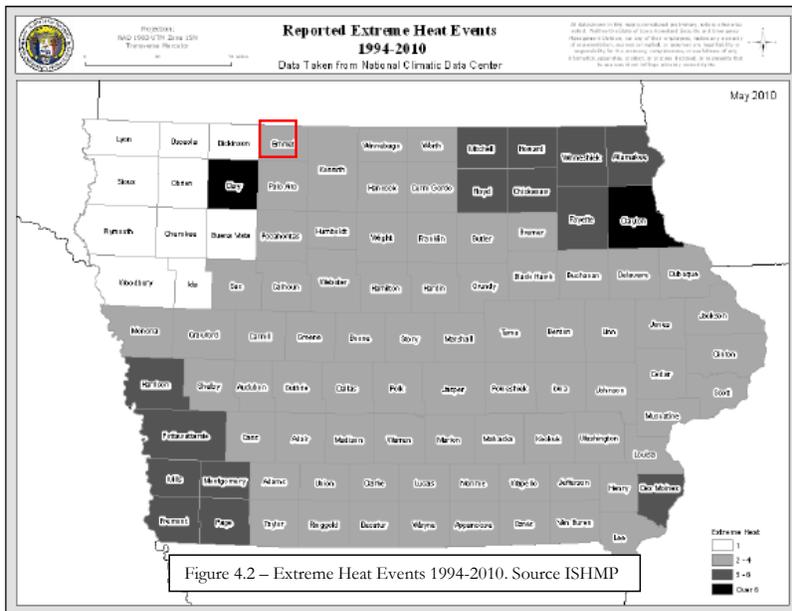
Source: National Oceanic and Atmospheric Administration http://www.crh.noaa.gov/jkl/?n=heat_index_calculator

Table 4.8 – Negative Affects from Extreme Heat

Category	Heat Index	Possible heat disorders for people in high risk groups
Extreme Danger	130°F +	Heat stroke or sunstroke likely.
Danger	105 - 129°F	Sunstroke, muscle cramps, and/or heat exhaustion likely. Heatstroke possible with prolonged exposure and/or physical activity.
Extreme Caution	90 - 105°F	Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.
Caution	80 - 90°F	Fatigue possible with prolonged exposure and/or physical activity.

Source: National Oceanic and Atmospheric Administration http://www.crh.noaa.gov/jkl/?n=heat_index_calculator

During the period between 1995 and 2009 Iowa experienced nineteen (19) extreme heat events. The heat wave that occurred in July of 1995 had a major impact across the entire state, temperatures ranged from 98 degrees to 108 degrees with heat indices reaching a high of 131 degrees. This event lasted two (2) days causing 3.8 million dollars of property damage and resulted in three (3) fatalities. The following map depicts the number of extreme heat occurrences from 1994-2009.



4.2.4. Magnitude/Severity:

The severity that comes with extreme heat events, the planning committee determined that it would be 'Limited' to the county. That 10-25% of local property would be affected. The committee determined that those to be most affected would those that are elderly or young, and believe that there are enough assets in the communities that those that are disadvantaged and with out AC could find a place to find comfort in an event.

The 2010 State of Iowa Hazard Mitigation Plan estimates Emmet County, has an estimation loss of \$3,000.00 due to extreme heat.

4.2.5. Warning Time:

The committee determined that there would be more than 24 hours warning time in the event of extreme heat. The committee felt that weather forecasters usually get this event correct and are able to determine ahead of time if the temperatures are going to be extreme.

4.2.6. Duration:

The committee determined that an event of extreme heat would typically last a couple days up to a week before the temperatures would become bearable again.

4.2.7. Hazard Total Score: 2.95

4.3 Flash Flood

4.3.1 Definition and description:

A flash flood is an event that occurs with little or no warning where water levels rise at an extremely fast rate. Flash flooding results from intense rainfall over a brief period, sometimes combined with rapid snowmelt, ice jam release, frozen ground, saturated soil, or impermeable surfaces. Most flash flooding is caused by slow-moving thunderstorms or thunderstorms repeatedly moving over the same area. Flash flooding is an extremely dangerous form of flooding which can reach full peak in only a few minutes and allows little or no time for protective measures to be taken by those in its path. Flash flood waters move at very fast speeds and can move boulders, tear out trees, scour channels, destroy buildings, and obliterate bridges. Flash flooding often results in higher loss of life, both human and animal, than slower developing river and stream flooding.

4.3.2 Hazards Identified by Jurisdiction:

The table below shows which jurisdictions identified Flash Flood as a hazard they are susceptible to.

	Unincorporated Emmet County	Armstrong	Dolliver	Estherville	Gruver	Ringsted	Wallingford	Iowa Lakes College
Flash Flood	X	X	X	X	X	X	X	

* ILCC Doesn't have any records of flash flooding affecting their critical facilities.

4.3.3 Probability:

The committee determined that it would be 'Likely' that a flash flood would occur in the next year. They believe not all events have been recorded by the NCDC. They concluded that every year there are events in Emmet County, but not every event bothers daily life of several people so they therefore don't get reported.

Table 4.9 - 10 FLASH FLOOD event(s) were reported in Emmet County

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	1.135M	135.00K
COUNTYWIDE	EMMET CO.	IA	07/09/2000	21:44	CST	Flash Flood		0	0	50.00K	75.00K
COUNTYWIDE	EMMET CO.	IA	06/13/2001	22:30	CST	Flash Flood		0	0	50.00K	10.00K
COUNTYWIDE	EMMET CO.	IA	09/15/2004	00:00	CST	Flash Flood		0	0	200.00K	50.00K
ESTHERVILLE	EMMET CO.	IA	05/07/2005	03:30	CST	Flash Flood		0	0	25.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	08/01/2006	21:30	CST	Flash Flood		0	0	25.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	03/14/2007	08:30	CST-6	Flash Flood		0	0	25.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	03/16/2010	12:11	CST-6	Flash Flood		0	0	10.00K	0.00K
WALLINGFORD	EMMET CO.	IA	06/25/2010	22:40	CST-6	Flash Flood		0	0	150.00K	0.00K
WALLINGFORD	EMMET CO.	IA	06/26/2010	02:45	CST-6	Flash Flood		0	0	500.00K	0.00K
WALLINGFORD	EMMET CO.	IA	07/14/2011	12:27	CST-6	Flash Flood		0	0	100.00K	0.00K
Totals:								0	0	1.135M	135.00K

Source: National Climate Data Center

The previous table shows 10 events, there have been no deaths or injuries resulting from flash floods according to NCDC Data. Property damages totaled an estimated \$1.135 Million. Crop damages totaled an estimated \$135,000, according to NCDC data.

4.3.4. Magnitude/Severity:

Emmet County, Estherville and Wallingford are the only ones that are mapped. On the critical facility maps the SFHA are depicted on them or if there are areas prone to flooding (determined by each community committee). Communities came up with an estimated number of structures in that area. Some of the flood maps are very outdated and that area is no longer a rivers or creeks in some areas. Loss areas are displayed on the critical facilities map also numbers are below for their estimated structures and values which are based off of the average number of structures and average prices of each in the communities. Communities that did not determine an exact amount of structures vulnerable would like to use the vulnerability assessment that is in Section 5.2 for a breakdown % of structures and values vulnerable. It is to be known that flash floods are a natural hazard that usually occurs at unknown time and location, therefore these are just estimates in good faith to get the communities thinking of the possible outcomes for damages from flash floods. The maps are to be found in Section 9. It is to be noted that Emmet County did not determine damage estimates the same way as the communities determined, because of time and resources it was to large of task to determine that number, because again it is difficult to determine when and where and how much will be affected.

City	# of residential	Average Cost	# of Commercial, Industrial,	Average Cost	Total Lost Estimate
Armstrong	48	\$64,474	6	\$84,906	\$3,604,192
Dolliver	0	\$32,115	0	\$91,880	\$0
Estherville	510	\$69,518	11	\$28,120	\$35,763,686
Gruver	8	\$43,056	0	\$501,096	\$344,449
Ringsted	12	\$37,283	0	\$398,859	\$447,392
Wallingford	24	\$46,369	0	\$85,338	\$1,112,855

The 2010 State of Iowa Hazard Mitigation Plan estimates Emmet County, has an annual estimation loss of \$11,587,529.41 due to flood. The State Plan does not separate annual estimation loss for flash flood and river flood.

4.3.5. Warning Time:

The committee determined that there is 12 to 24 hours warning time that storms that would produce heavy rain and could potential cause flash flooding.

4.3.6. Duration:

The consensus of the committee was that the affected from a flash flood would be a week or less. By then those that were affected would be able to get into cleanup mode.

4.3.7. Hazard Total Score: 2.55

4.4 Hailstorm

4.4.1 Definition and description:

Hailstorms are an outgrowth of a severe thunderstorm in which pellets or irregularly shaped lumps of ice greater than 1 inch in diameter fall with rain. Hail is produced in many strong thunderstorms by strong rising currents of air carrying water droplets to a height where freezing occurs, the ice particles grow in size until they are too heavy to be supported by the updraft and fall back to earth. Hail can be smaller than a pea or as large as a softball and can be very destructive to plants and crops; pets and livestock are particularly vulnerable to hail. The following map depicts a geographic breakdown of the number of hailstorms in Iowa since 1956 to 2010.

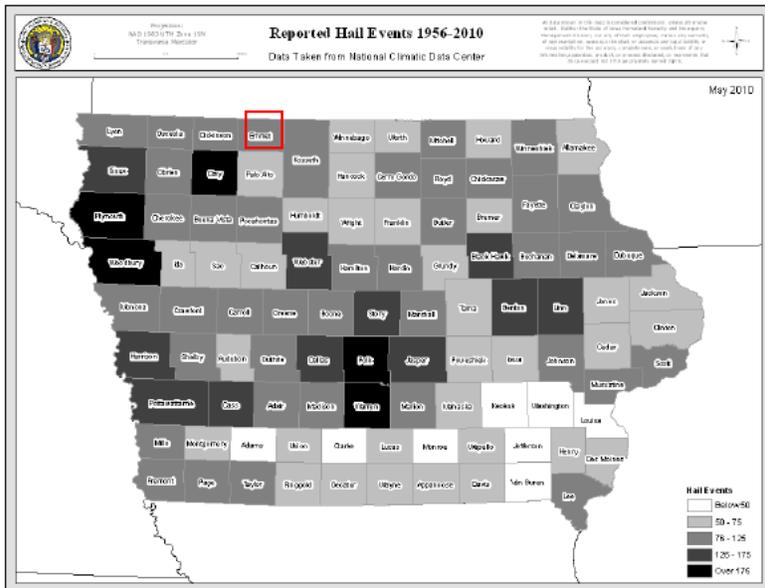


Figure 4.3 – Hail Events 1956-2010. Source ISHMP

4.4.2. Hazards Identified by Jurisdiction:

The table below shows which jurisdictions identified hailstorm as a hazard they are susceptible to.

	Unincorporated Emmet County	Armstrong	Dolliver	Estherville	Gruver	Ringsted	Wallingford	Iowa Lakes College
Hailstorm	X	X	X	X	X	X	X	X

4.4.3. Probability:

The committee determined the probability of hailstorm to occur again to be ‘Highly Likely’ to affected the county in a negative way. The committee referenced the following table that a 59 events have occurred in the 13 years, which is about 4.5 events per year and that corresponds with the rating criteria which is a 1 to 1 chance to occur in any given year.

Table 4.11

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	180.00K	297.00K
ESTHERVILLE	EMMET CO.	IA	07/02/2000	04:50	CST	Hail	0.88 in.	0	0	1.00K	5.00K
WALLINGFORD	EMMET CO.	IA	04/20/2001	22:12	CST	Hail	1.00 in.	0	0	3.00K	0.00K
RINGSTED	EMMET CO.	IA	04/20/2001	22:39	CST	Hail	1.75 in.	0	0	10.00K	0.00K
RINGSTED	EMMET CO.	IA	05/01/2001	15:40	CST	Hail	1.00 in.	0	0	5.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	06/12/2001	20:56	CST	Hail	0.75 in.	0	0	0.00K	5.00K
ESTHERVILLE	EMMET CO.	IA	06/12/2001	21:04	CST	Hail	0.88 in.	0	0	2.00K	5.00K
ESTHERVILLE	EMMET CO.	IA	06/12/2001	21:06	CST	Hail	0.75 in.	0	0	0.00K	5.00K
RINGSTED	EMMET CO.	IA	06/18/2001	18:37	CST	Hail	1.75 in.	0	0	20.00K	10.00K
ARMSTRONG	EMMET CO.	IA	06/18/2001	18:46	CST	Hail	2.75 in.	0	0	20.00K	10.00K
ESTHERVILLE	EMMET CO.	IA	05/05/2002	19:05	CST	Hail	0.88 in.	0	0	3.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	05/05/2002	19:20	CST	Hail	0.75 in.	0	0	0.00K	0.00K
WALLINGFORD	EMMET CO.	IA	07/28/2002	18:00	CST	Hail	0.88 in.	0	0	2.00K	5.00K
WALLINGFORD	EMMET CO.	IA	07/28/2002	18:15	CST	Hail	0.75 in.	0	0	0.00K	5.00K
WALLINGFORD	EMMET CO.	IA	07/28/2002	19:45	CST	Hail	0.88 in.	0	0	2.00K	5.00K
ARMSTRONG	EMMET CO.	IA	04/18/2004	19:45	CST	Hail	0.88 in.	0	0	1.00K	0.00K
WALLINGFORD	EMMET CO.	IA	05/07/2004	22:55	CST	Hail	1.00 in.	0	0	5.00K	5.00K
ESTHERVILLE	EMMET CO.	IA	05/19/2004	16:43	CST	Hail	1.50 in.	0	0	5.00K	5.00K
DOLLIVER	EMMET CO.	IA	05/19/2004	17:05	CST	Hail	0.88 in.	0	0	1.00K	5.00K
RINGSTED	EMMET CO.	IA	06/11/2004	14:44	CST	Hail	0.75 in.	0	0	0.00K	5.00K
RINGSTED	EMMET CO.	IA	06/11/2004	14:46	CST	Hail	1.00 in.	0	0	2.00K	5.00K
RINGSTED	EMMET CO.	IA	06/11/2004	15:18	CST	Hail	0.75 in.	0	0	0.00K	5.00K
ARMSTRONG	EMMET CO.	IA	06/11/2004	15:29	CST	Hail	0.75 in.	0	0	0.00K	5.00K
RINGSTED	EMMET CO.	IA	06/11/2004	15:45	CST	Hail	1.50 in.	0	0	10.00K	3.00K
ARMSTRONG	EMMET CO.	IA	07/12/2004	23:30	CST	Hail	0.88 in.	0	0	2.00K	5.00K
ESTHERVILLE	EMMET CO.	IA	03/30/2005	04:28	CST	Hail	0.88 in.	0	0	2.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	05/06/2005	23:30	CST	Hail	0.88 in.	0	0	2.00K	0.00K
RINGSTED	EMMET CO.	IA	05/08/2005	16:15	CST	Hail	0.75 in.	0	0	0.00K	0.00K
RINGSTED	EMMET CO.	IA	05/08/2005	16:19	CST	Hail	2.00 in.	0	0	25.00K	0.00K
RINGSTED	EMMET CO.	IA	05/08/2005	16:24	CST	Hail	0.88 in.	0	0	1.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	06/13/2005	16:34	CST	Hail	0.75 in.	0	0	0.00K	5.00K
ESTHERVILLE	EMMET CO.	IA	07/03/2005	05:33	CST	Hail	0.88 in.	0	0	3.00K	5.00K

WALLINGFORD	EMMET CO.	IA	07/03/2005	05:36	CST	Hail	0.88 in.	0	0	2.00K	5.00K
WALLINGFORD	EMMET CO.	IA	07/03/2005	05:43	CST	Hail	0.88 in.	0	0	2.00K	5.00K
ESTHERVILLE	EMMET CO.	IA	08/09/2005	15:25	CST	Hail	0.88 in.	0	0	2.00K	5.00K
WALLINGFORD	EMMET CO.	IA	08/09/2005	15:38	CST	Hail	1.00 in.	0	0	3.00K	5.00K
ARMSTRONG	EMMET CO.	IA	09/08/2005	08:30	CST	Hail	1.00 in.	0	0	3.00K	5.00K
GRUVER	EMMET CO.	IA	10/04/2005	15:26	CST	Hail	1.00 in.	0	0	5.00K	20.00K
ESTHERVILLE	EMMET CO.	IA	05/06/2008	15:47	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
GRUVER	EMMET CO.	IA	05/06/2008	15:52	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
ARMSTRONG	EMMET CO.	IA	05/06/2008	15:58	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
WALLINGFORD	EMMET CO.	IA	07/09/2009	20:02	CST-6	Hail	0.88 in.	0	0	0.00K	5.00K
WALLINGFORD	EMMET CO.	IA	07/09/2009	20:48	CST-6	Hail	0.88 in.	0	0	0.00K	5.00K
ESTHERVILLE	EMMET CO.	IA	07/09/2009	20:53	CST-6	Hail	0.88 in.	0	0	0.00K	5.00K
WALLINGFORD	EMMET CO.	IA	07/09/2009	20:53	CST-6	Hail	0.88 in.	0	0	0.00K	10.00K
RALEIGH	EMMET CO.	IA	07/14/2009	18:59	CST-6	Hail	0.88 in.	0	0	0.00K	10.00K
ESTHERVILLE	EMMET CO.	IA	07/14/2009	19:00	CST-6	Hail	0.75 in.	0	0	0.00K	50.00K
ESTHERVILLE	EMMET CO.	IA	04/24/2010	15:15	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
WALLINGFORD	EMMET CO.	IA	06/01/2010	13:36	CST-6	Hail	1.00 in.	0	0	5.00K	5.00K
RALEIGH	EMMET CO.	IA	06/01/2010	14:00	CST-6	Hail	0.75 in.	0	0	0.00K	5.00K
RINGSTED	EMMET CO.	IA	06/17/2010	15:13	CST-6	Hail	0.88 in.	0	0	1.00K	5.00K
ESTHERVILLE	EMMET CO.	IA	07/17/2010	22:10	CST-6	Hail	1.00 in.	0	0	1.00K	10.00K
WALLINGFORD	EMMET CO.	IA	05/21/2011	17:03	CST-6	Hail	1.00 in.	0	0	3.00K	5.00K
WALLINGFORD	EMMET CO.	IA	05/21/2011	18:38	CST-6	Hail	1.75 in.	0	0	10.00K	3.00K
WALLINGFORD	EMMET CO.	IA	05/21/2011	18:42	CST-6	Hail	2.75 in.	0	0	5.00K	3.00K
ESTHERVILLE ARPT	EMMET CO.	IA	05/21/2011	18:52	CST-6	Hail	1.50 in.	0	0	3.00K	3.00K
HUNTINGTON	EMMET CO.	IA	05/21/2011	19:05	CST-6	Hail	1.00 in.	0	0	2.00K	0.00K
ARMSTRONG	EMMET CO.	IA	05/04/2012	16:02	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
RINGSTED	EMMET CO.	IA	06/14/2012	18:29	CST-6	Hail	1.00 in.	0	0	1.00K	10.00K
WALLINGFORD	EMMET CO.	IA	06/14/2012	18:37	CST-6	Hail	1.50 in.	0	0	5.00K	10.00K
Totals:								0	0	180.00K	297.00K

Source: National Climate Data Center

4.4.4. Magnitude/Severity:

The committee determined that the severity in a hailstorm would be 'Limited' to the county. There will be 10-25% of the property in the county to be damaged. The committee stated that the information supplied by the NCDC was correct in the number of events but off on the property and crop damage. Although they didn't

have figures for the events they determined that what the NCDC supplied was too low and that future events would not be reflected correctly if those damage numbers were projected for future events.

The 2010 State of Iowa Hazard Mitigation Plan estimates Emmet County, has an annual estimation loss of \$48,875.00 due to hailstorm.

4.4.5. Warning Time:

There usually is 6 to 12 hour warning time to be able to determine which storms coming into the area may have the possibility to bring hail. Then trained storm spotters from the fire departments on the committee determined will go out prior to events and determined the possible severity.

4.4.6. Duration:

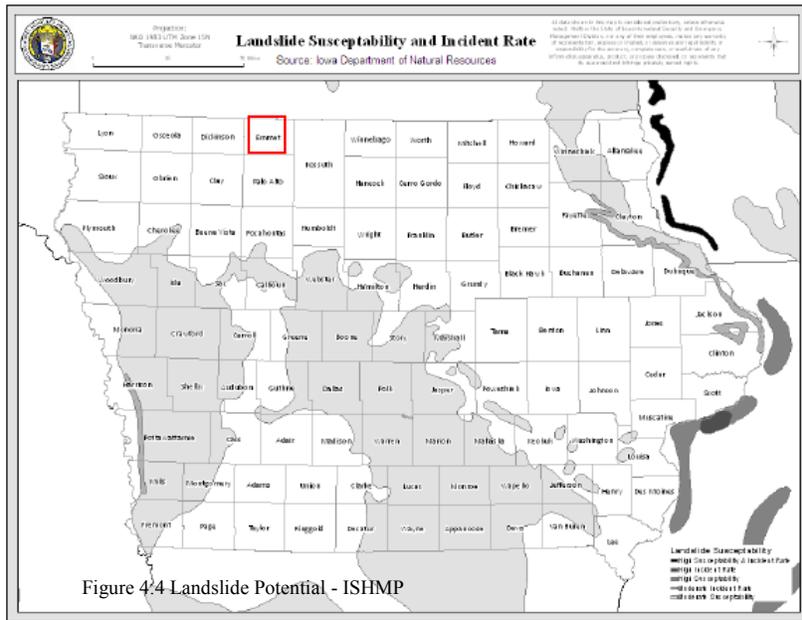
The committee determined that a hailstorm usually only last several hours at the most.

4.4.7. Hazard Total Score: 2.95

4.5 Landslide

4.5.1 Definition and description:

Landslides occur when susceptible rock, earth, or debris moves down a slope under the force of gravity and water. Landslides may be very small or very large, and can move at slow to very high speeds. A natural phenomenon, small scale landslides have been occurring in slide-prone areas of Iowa long before human occupation. New landslides can occur because of rainstorms, fires, earthquakes, and various human activities that modify slope and drainage.



4.5.2 Hazards Identified by Jurisdiction:

The table below shows which jurisdictions identified landslide as a hazard they are susceptible to.

	Unincorporated Emmet County	Armstrong	Dolliver	Estherville	Grauer	Ringsted	Wallingford	Iowa Lakes College
Landslide	X			X				

All communities that did not chose landslide determined that their lands are not likely to be susceptible to landslides and determined to not add them to their rankings. Estherville and Unincorporated Emmet County are two (2) communities that did select landslide as a susceptible hazard of their community, albeit a small risk, but nonetheless each community wanted to identify landslide as a

susceptible hazard. Each community identified having steep hills, ravines and slopes along the West Fork Des Moines River and in Fort Defiance State Park. The topographic map below illustrates the land elevations for areas which may be susceptible to a landslide.



4.5.3. Probability:

The committee determined that landslide is 'Unlikely'. The committee had no records of events but think it's possible near the river valleys, which have more steep lands.

4.5.4. Magnitude/Severity:

The committee decided that if a landslide would happen in the county it would most likely be away from development and there for it would be 'Negligible' in severity for Emmet County.

4.5.5. Warning Time:

There is no warning time in the event of a landslide.

4.5.6. Duration:

The committee determined that if a landslide would occur in the county that it would affect people for less than 6 hours, because the area would most likely be unpopulated.

4.4.7. Hazard Total Score: 1.45

4.6 River Flood

4.6.1 Definition and description:

River flooding is a rising or overflowing of a tributary or body of water that covers adjacent land, not usually covered by water, when the volume of water in a stream exceeds the channel's capacity. Floods are the most common and widespread of all natural disasters, except fire.

Most communities may experience some kind of flooding after spring rains, heavy thunderstorms, winter snow thaws, waterway obstructions, or levee or dam failures. Winter snow thaws, waterway obstructions, or levee or dam failures snow thaws, waterway obstructions, or levee or dam failures.

4.6.2 Hazards Identified by Jurisdiction:

The table below shows which jurisdictions identified river flood as a hazard they are susceptible to.

	Unincorporated Emmet County	Armstrong	Dolliver	Estherville	Gruver	Ringsted	Wallingford	Iowa Lakes College
River Flood	X	X		X			X	

* Those that did not choose river flood, don't have a river in their vicinity.

4.6.3 Probability:

After the committee reviewed the following NCDC data they determined that there is a flooding event about 1+ a year. Therefore they determined that river flooding was 'Highly Likely' to occur in any given year.

Table 4.12

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	1.778M	22.043M
EMMET (ZONE)	EMMET (ZONE)	IA	03/23/2001	18:00	CST	Flood		0	0	7.50K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	04/01/2001	00:00	CST	Flood		0	0	5.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	04/07/2001	21:00	CST	Flood		0	0	150.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	05/01/2001	00:00	CST	Flood		0	0	75.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	05/21/2001	18:00	CST	Flood		0	0	30.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	06/12/2001	15:00	CST	Flood		0	0	25.00K	50.00K
EMMET (ZONE)	EMMET (ZONE)	IA	05/04/2003	12:00	CST	Flood		0	0	5.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	05/09/2003	06:00	CST	Flood		0	0	5.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	06/27/2003	06:00	CST	Flood		0	0	5.00K	10.00K
EMMET (ZONE)	EMMET (ZONE)	IA	05/22/2004	18:00	CST	Flood		0	0	100.00K	298.04K
EMMET (ZONE)	EMMET (ZONE)	IA	09/15/2004	05:00	CST	Flood		0	0	50.00K	100.00K
EMMET (ZONE)	EMMET (ZONE)	IA	05/07/2005	06:45	CST	Flood		0	0	10.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	05/13/2005	02:00	CST	Flood		0	0	30.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	09/25/2005	22:00	CST	Flood		0	0	25.00K	50.00K

COUNTYWIDE	EMMET CO.	IA	04/01/2006	00:00	CST	Flood		0	0	5.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	03/12/2007	23:30	CST-6	Flood		0	0	50.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	05/06/2007	22:15	CST-6	Flood		0	0	25.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	10/18/2007	21:30	CST-6	Flood		0	0	10.00K	10.00K
HUNTINGTON	EMMET CO.	IA	06/07/2008	18:00	CST-6	Flood		0	0	50.00K	100.00K
HUNTINGTON	EMMET CO.	IA	03/14/2010	12:45	CST-6	Flood		0	0	100.00K	0.00K
HUNTINGTON	EMMET CO.	IA	04/01/2010	00:00	CST-6	Flood		0	0	50.00K	0.00K
ARMSTRONG	EMMET CO.	IA	06/12/2010	12:00	CST-6	Flood		0	0	0.00K	20.000M
HUNTINGTON	EMMET CO.	IA	06/26/2010	09:15	CST-6	Flood		0	0	250.00K	1.000M
HUNTINGTON	EMMET CO.	IA	07/01/2010	00:00	CST-6	Flood		0	0	50.00K	250.00K
HUNTINGTON	EMMET CO.	IA	09/23/2010	09:28	CST-6	Flood		0	0	100.00K	25.00K
HUNTINGTON	EMMET CO.	IA	10/01/2010	00:00	CST-6	Flood		0	0	25.00K	0.00K
HUNTINGTON	EMMET CO.	IA	02/18/2011	06:00	CST-6	Flood		0	0	5.00K	0.00K
HUNTINGTON	EMMET CO.	IA	03/17/2011	00:46	CST-6	Flood		0	0	100.00K	0.00K
HUNTINGTON	EMMET CO.	IA	04/01/2011	00:00	CST-6	Flood		0	0	10.00K	0.00K
HUNTINGTON	EMMET CO.	IA	05/01/2011	00:00	CST-6	Flood		0	0	0.00K	0.00K
HUNTINGTON	EMMET CO.	IA	05/22/2011	13:45	CST-6	Flood		0	0	100.00K	0.00K
EMMET CO.	EMMET CO.	IA	06/01/2011	00:00	CST-6	Flood		0	0	250.00K	0.00K
EMMET CO.	EMMET CO.	IA	06/15/2011	01:55	CST-6	Flood		0	0	50.00K	100.00K
HUNTINGTON	EMMET CO.	IA	07/01/2011	00:00	CST-6	Flood		0	0	10.00K	50.00K
HUNTINGTON	EMMET CO.	IA	05/29/2012	22:00	CST-6	Flood		0	0	15.00K	0.00K
Totals:								0	0	1.778M	22.043M

Source: National Climate Data Center

4.6.4. Magnitude/Severity:

The severity for a river flood was determined to be 'Limited,' the committee concluded that roads and bridges could be washed out and house near rivers could also receive damages.

The 2010 State of Iowa Hazard Mitigation Plan estimates Emmet County, has an annual estimation loss of \$11,587,529.41 due to flood. The State Plan does not separate annual estimation loss for flash flood and river flood.

City	# of residential	Average Cost	# of Commercial, Industrial,	Average Cost	Total Lost Estimate
Armstrong	48	\$64,474	6	\$84,906	\$3,604,192
Dolliver	0	\$32,115	0	\$91,880	\$0
Estherville	510	\$69,518	11	\$28,120	\$35,763,686
Gruver	8	\$43,056	0	\$501,096	\$344,449
Ringsted	12	\$37,283	0	\$398,859	\$447,392
Wallingford	24	\$46,369	0	\$85,338	\$1,112,855

4.6.5. Warning Time:

The committee determined that with river floods there are 12-24 hours of warning time. The committee stated that if it has been a heavy rainy season then the area will be more prone to flood and will occur quicker.

4.6.6. Duration:

The committee determined that those affected by a river flood would be affected for more than a week. They concluded that roads or bridges could be washed out, or those croplands that are near the river will be unable to grow crops for at least the year after an event.

4.6.7. Hazard Total Score: 3.1

4.7 Severe Winter Storm

4.7.1 Definition and description:

Severe winter weather conditions that affect day-to-day activities can include blizzard conditions, heavy snow, blowing snow, freezing rain, heavy sleet, and extreme cold. Winter storms are common during the months of October through April.

The various types of severe winter weather can cause considerable damage. Heavy snows can immobilize transportation systems, down trees and power lines, collapse buildings, and the loss of livestock and wildlife. Blizzard conditions are winter storms lasting at least three (3) hours with sustained winds of 35 mph or more, reduced visibility of 1/4 mile or less, and white out conditions. Heavy snows of more than six (6) inches in a 12 hour period or freezing rain greater than 1/4 inch accumulation causing hazardous conditions in the community can slow or stop the flow of vital supplies as well as disrupting emergency and medical services.

Loose snow begins to drift when wind speed reaches a critical speed of 9 to 10 mph under freezing conditions. The potential for drifting is substantially higher in open country than in urban areas where buildings, trees, and other features obstruct the wind.

Ice storms have resulted in fallen trees, broken tree limbs, downed power lines and utility poles, fallen communications towers, and impassable transportation routes. Severe ice storms have caused total electric power outages over large areas of Iowa and rendered assistance unavailable to those in need due to impassable roads.

4.7.2 Hazards Identified by Jurisdiction:

The table below shows which jurisdictions identified severe winter storm as a hazard they are susceptible to.

	Unincorporated Emmet County	Armstrong	Dolliver	Estherville	Gruver	Ringssted	Wallingford	Iowa Lakes College
Severe Winter Storm	X	X	X	X	X	X	X	X

4.7.3 Probability:

The committee determined that with 24 events from 2000-2012 which amounts to just over 2 events per year. They decided that it is 'Highly Likely' to occur every year.

Table 4.14

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	375.90K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	01/19/2000	07:00	CST	Winter Storm		0	0	1.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	12/10/2000	21:00	CST	Winter Storm		0	0	24.90K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	02/24/2007	03:00	CST-6	Winter Storm		0	0	250.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	12/01/2007	08:00	CST-6	Winter Storm		0	0	10.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	12/08/2008	14:00	CST-6	Winter Storm		0	0	10.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	12/18/2008	21:30	CST-6	Winter Storm		0	0	5.00K	0.00K

EMMET (ZONE)	EMMET (ZONE)	IA	12/24/2009	14:00	CST-6	Winter Storm		0	0	50.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	01/06/2010	13:00	CST-6	Winter Storm		0	0	25.00K	0.00K
Totals:								0	0	375.90K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	205.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	01/29/2001	05:00	CST	Ice Storm		0	0	25.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	03/08/2002	16:00	CST	Ice Storm		0	0	25.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	03/14/2002	09:00	CST	Ice Storm		0	0	75.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	04/04/2003	08:00	CST	Ice Storm		0	0	5.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	01/20/2010	07:00	CST-6	Ice Storm		0	0	50.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	02/20/2011	04:00	CST-6	Ice Storm		0	0	25.00K	0.00K
Totals:								0	0	205.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	145.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	04/07/2000	05:00	CST	Heavy Snow		0	0	10.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	01/31/2002	09:00	CST	Heavy Snow		0	0	20.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	12/02/2003	20:00	CST	Heavy Snow		0	0	0.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	01/26/2004	07:00	CST	Heavy Snow		0	0	0.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	01/04/2005	17:00	CST	Heavy Snow		0	0	10.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	03/18/2005	10:30	CST	Heavy Snow		0	0	5.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	01/14/2007	12:00	CST-6	Heavy Snow		0	0	0.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	11/13/2010	02:00	CST-6	Heavy Snow		0	0	100.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	01/31/2011	07:00	CST-6	Heavy Snow		0	0	0.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	01/20/2012	03:00	CST-6	Heavy Snow		0	0	0.00K	0.00K
Totals:								0	0	145.00K	0.00K

Source: National Climate Data Center

4.7.4. Magnitude/Severity:

The committee determined that with a severe winter storm would be 'Critical' in terms of severity. The committee stated that there have been fatalities that are not on the NCDC data. The exact storm from the list but knew there have been deaths related to severe winter storms. They also stated that there are a lot of older properties in the county that are kept up as they should be and some properties may be more prone to roof collapse because of their age and lack of upkeep.

The 2010 State of Iowa Hazard Mitigation Plan estimates Emmet County, has an annual estimation loss of \$28,420.62 due to snow and ice.

4.7.5. Warning Time:

The committee determined that there would be 12-24 hours of warning for a severe winter storm.

4.7.6. Duration:

The committee determined that typically Iowa severe winter storms will usually have lasting affects for more than a week, typically the initial storm with be complimented with wind which will make the affects felt longer.

4.7.7. Hazard Total Score: 3.4

4.8 Thunderstorm and Lightning

4.8.1 Definition and description:

Thunderstorms are common in Iowa and can occur singly, in clusters, or in lines. Resulting in heavy rains, winds reaching or exceeding 58 mph, producing a tornado, or dropping surface hail at least 1.00 inch in diameter. They are created from a combination of moisture, rapidly raising warm air, and a lifting mechanism such as clashing warm and cold air masses.

Between 1955 and March of 2010, at least 10,090 severe thunderstorm events have impacted Iowa. Because thunderstorms may occur singly, in clusters, or in lines, it is possible that several thunderstorms may affect the same area in the course of a few hours. It is likely that more than 10,090 individual severe storms systems occurred in the state, one system may spawn multiple events. The map that follows indicates that thunderstorms and wind events occur across the State without significant pattern.

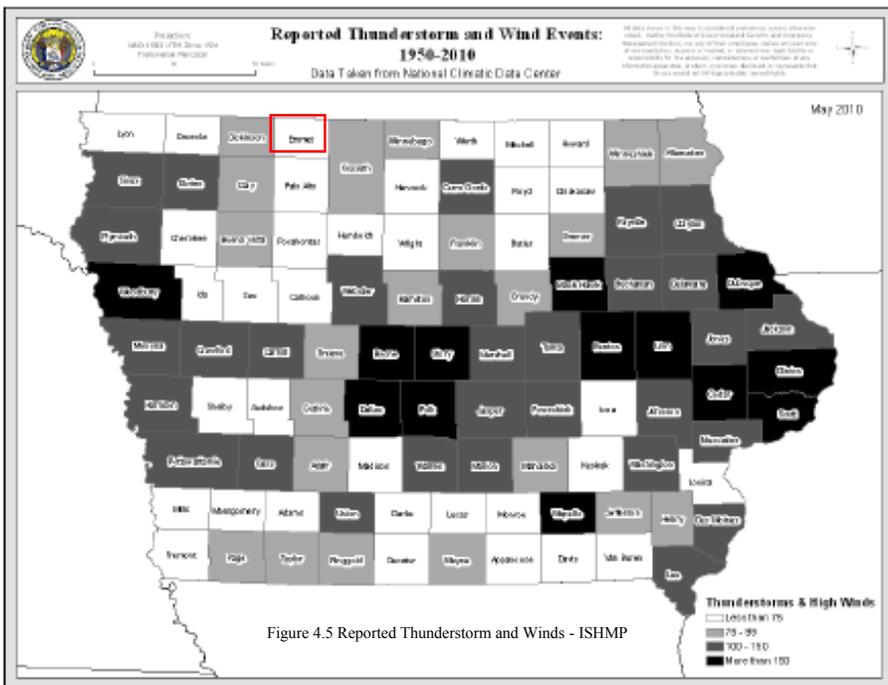


Figure 4.5 Reported Thunderstorm and Winds - ISHMP

4.8.2. Hazards Identified by Jurisdiction:

The table below shows which jurisdictions identified thunderstorm and lightning as a hazard they are susceptible to.

	Unincorporated Emmet County	Armstrong	Dolliver	Estherville	Gruver	Ringsted	Wallingford	Iowa Lakes College
Thunderstorm and Lightning	X	X	X	X	X	X	X	X

4.8.3. Probability:

The committee determined that based on previous data that there would be a ‘Highly Likely’ chance for an event to occur. Based on the NCDC that follows the county sees 1+ event per year.

Table 4.15

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	714.00K	59.00K
ESTHERVILLE	EMMET CO.	IA	05/08/2000	01:30	CST	Thunderstorm Wind	52 kts. E	0	0	30.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	07/02/2000	04:57	CST	Thunderstorm Wind	52 kts. E	0	0	1.00K	0.00K
ESTHERVILLE ARPT	EMMET CO.	IA	06/12/2001	21:04	CST	Thunderstorm Wind	71 kts. M	0	0	15.00K	2.00K
ESTHERVILLE	EMMET CO.	IA	06/12/2001	21:10	CST	Thunderstorm Wind	65 kts. E	0	0	20.00K	1.00K
ESTHERVILLE ARPT	EMMET CO.	IA	06/12/2001	22:48	CST	Thunderstorm Wind	53 kts. M	0	0	5.00K	0.00K
DOLLIVER	EMMET CO.	IA	06/12/2001	22:55	CST	Thunderstorm Wind	61 kts. E	0	0	25.00K	0.00K
DOLLIVER	EMMET CO.	IA	06/12/2001	23:20	CST	Thunderstorm Wind	61 kts. E	0	0	20.00K	0.00K
ESTHERVILLE ARPT	EMMET CO.	IA	06/13/2001	20:57	CST	Thunderstorm Wind	50 kts. M	0	0	1.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	06/13/2001	20:57	CST	Thunderstorm Wind	65 kts. M	0	0	20.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	04/16/2002	19:33	CST	Thunderstorm Wind	52 kts. E	0	0	5.00K	0.00K
ARMSTRONG	EMMET CO.	IA	04/16/2002	21:58	CST	Thunderstorm Wind	50 kts. E	0	0	2.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	06/07/2002	17:42	CST	Thunderstorm Wind	61 kts. E	0	0	5.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	07/03/2003	23:45	CST	Thunderstorm Wind	52 kts. EG	0	0	2.00K	0.00K

ESTHERVILLE ARPT	EMMET CO.	IA	07/03/2003	23:52	CST	Thunderstorm Wind	51 kts. MG	0	0	1.00K	0.00K
RINGSTED	EMMET CO.	IA	07/04/2003	00:10	CST	Thunderstorm Wind	52 kts. EG	0	0	3.00K	0.00K
WALLINGFORD	EMMET CO.	IA	07/12/2004	22:40	CST	Thunderstorm Wind	57 kts. EG	0	0	10.00K	0.00K
ARMSTRONG	EMMET CO.	IA	06/20/2005	15:55	CST	Thunderstorm Wind	52 kts. EG	0	0	2.00K	0.00K
ARMSTRONG	EMMET CO.	IA	07/25/2005	00:30	CST	Thunderstorm Wind	52 kts. EG	0	0	3.00K	0.00K
ARMSTRONG	EMMET CO.	IA	08/09/2005	16:00	CST	Thunderstorm Wind	61 kts. EG	0	0	10.00K	0.00K
RINGSTED	EMMET CO.	IA	06/20/2006	07:00	CST	Thunderstorm Wind	57 kts. EG	0	0	10.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	08/01/2006	19:00	CST	Thunderstorm Wind	52 kts. EG	0	0	5.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	06/16/2007	15:00	CST-6	Thunderstorm Wind	57 kts. EG	0	0	10.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	07/16/2007	16:20	CST-6	Thunderstorm Wind	61 kts. EG	0	0	25.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	07/16/2007	16:20	CST-6	Thunderstorm Wind	61 kts. EG	0	0	25.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	07/16/2007	16:20	CST-6	Thunderstorm Wind	61 kts. EG	0	0	10.00K	2.00K
ESTHERVILLE	EMMET CO.	IA	07/16/2007	16:22	CST-6	Thunderstorm Wind	61 kts. EG	0	0	10.00K	2.00K
ESTHERVILLE ARPT	EMMET CO.	IA	07/16/2007	16:25	CST-6	Thunderstorm Wind	53 kts. MG	0	0	3.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	07/16/2007	16:28	CST-6	Thunderstorm Wind	65 kts. EG	0	0	50.00K	5.00K
ESTHERVILLE ARPT	EMMET CO.	IA	07/16/2007	16:32	CST-6	Thunderstorm Wind	54 kts. MG	0	0	3.00K	0.00K
RINGSTED	EMMET CO.	IA	07/16/2007	16:35	CST-6	Thunderstorm Wind	52 kts. EG	0	0	20.00K	2.00K
ESTHERVILLE ARPT	EMMET CO.	IA	07/16/2007	16:38	CST-6	Thunderstorm Wind	56 kts. MG	0	0	3.00K	0.00K
ARMSTRONG	EMMET CO.	IA	07/16/2007	16:40	CST-6	Thunderstorm Wind	65 kts. EG	0	0	75.00K	20.00K
ARMSTRONG	EMMET CO.	IA	07/16/2007	16:45	CST-6	Thunderstorm Wind	61 kts. EG	0	0	25.00K	10.00K
ESTHERVILLE	EMMET CO.	IA	07/26/2007	18:11	CST-6	Thunderstorm Wind	56 kts. MG	0	0	3.00K	5.00K

WALLINGFORD	EMMET CO.	IA	06/11/2008	18:43	CST-6	Thunderstorm Wind	57 kts. EG	0	0	5.00K	0.00K
WALLINGFORD	EMMET CO.	IA	06/11/2008	18:43	CST-6	Thunderstorm Wind	61 kts. EG	0	0	10.00K	0.00K
ESTHERVILLE ARPT	EMMET CO.	IA	03/23/2009	21:18	CST-6	Thunderstorm Wind	54 kts. MG	0	0	2.00K	0.00K
DOLLIVER	EMMET CO.	IA	06/25/2010	20:00	CST-6	Thunderstorm Wind	57 kts. EG	0	0	15.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	06/25/2010	20:29	CST-6	Thunderstorm Wind	61 kts. MG	0	0	5.00K	0.00K
WALLINGFORD	EMMET CO.	IA	06/25/2010	20:44	CST-6	Thunderstorm Wind	61 kts. EG	0	0	50.00K	0.00K
DOLLIVER	EMMET CO.	IA	06/26/2010	20:04	CST-6	Thunderstorm Wind	52 kts. EG	0	0	5.00K	0.00K
WALLINGFORD	EMMET CO.	IA	06/26/2010	20:08	CST-6	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
ARMSTRONG	EMMET CO.	IA	06/26/2010	20:19	CST-6	Thunderstorm Wind	52 kts. EG	0	0	5.00K	0.00K
WALLINGFORD	EMMET CO.	IA	08/08/2010	19:53	CST-6	Thunderstorm Wind	61 kts. EG	0	0	25.00K	0.00K
WALLINGFORD	EMMET CO.	IA	08/08/2010	20:23	CST-6	Thunderstorm Wind	57 kts. EG	0	0	5.00K	0.00K
EMMET CO.	EMMET CO.	IA	06/20/2011	22:48	CST-6	Thunderstorm Wind	61 kts. EG	0	0	100.00K	10.00K
MAPLE HILL	EMMET CO.	IA	07/01/2011	18:20	CST-6	Thunderstorm Wind	57 kts. EG	0	0	5.00K	0.00K
DOLLIVER	EMMET CO.	IA	05/04/2012	15:12	CST-6	Thunderstorm Wind	56 kts. EG	0	0	5.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	05/04/2012	15:45	CST-6	Thunderstorm Wind	56 kts. EG	0	0	5.00K	0.00K
WALLINGFORD	EMMET CO.	IA	06/10/2012	17:24	CST-6	Thunderstorm Wind	50 kts. EG	0	0	3.00K	0.00K
RALEIGH	EMMET CO.	IA	06/14/2012	18:33	CST-6	Thunderstorm Wind	57 kts. EG	0	0	10.00K	0.00K
ESTHERVILLE ARPT	EMMET CO.	IA	06/14/2012	18:47	CST-6	Thunderstorm Wind	53 kts. MG	0	0	0.00K	0.00K
Totals:								0	0	714.00K	59.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	In i	PrD	CrD
Totals:								0	0	40.00K	0.00K
RINGSTED	EMMET CO.	IA	08/16/2002	23:30	CST	Lightning		0	0	25.00K	0.00K
ESTHERVILLE	EMMET CO.	IA	07/07/2008	05:48	CST-6	Lightning		0	0	15.00K	0.00K
Totals:								0	0	40.00K	0.00K

Table 4.16 - Source: National Climate Data Center

4.8.4. Magnitude/Severity:

The committee determined that in the event of a thunderstorm or lightning strike there would 'Limited' severity to the county. Depending on the strength of the storm, there could be more than 10-25% of property or cropland destroyed. The NCDC data recorded 54 thunderstorm and lightning events with property damage to \$754,000 which is \$13,963 per event.

The 2010 State of Iowa Hazard Mitigation Plan estimates Emmet County, has an estimation loss of \$5,294.12 due to Lightning.

The 2010 State of Iowa Hazard Mitigation Plan estimates Emmet County, has an estimation loss of \$64,058.82 due to Thunderstorm.

4.8.5. Warning Time:

The committee determined that there would be a 12-24 hour notice before a thunderstorm or lightning storm would hit.

4.8.6. Duration:

Either a thunderstorm or lightning storm would typically last less than 1 day.

4.8.7. Hazard Total Score: 2.9

4.9 Tornado

4.9.1 Definition and description:

A tornado is a violent whirling wind characteristically accompanied by a funnel shaped cloud extending down from a cumulonimbus cloud that progress in a narrow, erratic path. Rotating wind speeds can exceed 300 mph and travel across the ground at average speeds of 25-30 mph. A tornado can be a few yards to about a mile wide where it touches the ground, however, an average tornado, is a few hundred yards wide. It can move over land for distances ranging from short hops to many miles, causing great damage wherever it descends. The funnel is made visible by the dust sucked up and condensation of water droplets in the center of the funnel.

The new EF-scale was unveiled by the National Weather Service to the public in 2006. In February 2007, the Enhanced Fujita scale replaced the original Fujita scale in all tornado damage surveys in the United States. Below is a table comparing the estimated winds in the original F-scale and the operational EF-scale that is currently in use by the NWS.

Table 4.17 – Original vs. Enhanced Fujita Scales

ORIGINAL FUJITA F-SCALE		NEW ENHANCED FUJITA EF-SCALE	
F Number	3 Second Gust (mph)	EF Number	3 Second Gust (mph)
0	45-78	0	65-85
1	79-117	1	86-110
2	118-161	2	111-135
3	162-209	3	136-165
4	210-261	4	166-200
5	262-317	5	Over 200

Table 4.18 - EF Scale Classifications and Types of Damage Done

EF-Scale			
EF-Scale	Wind Speed	Classification	Type of Damage Done
EF-0	65-85 mph (105-137 km/h)	Light damage	Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF-1	86-110 mph (138-178 km/h)	Potential damage	Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF-2	111-135 mph (179-218 km/h)	Considerable damage	Roofs torn off houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF-3	136-165 mph (219-266 km/h)	Severe damage	Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF-4	166-200 mph (267-322 km/h)	Devastating damage	Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.

EF-5	200 mph + (322 km +)	Total destruction	Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (109 yd); steel reinforced concrete structure badly damaged; high-rise buildings have significant structural deformation; incredible phenomena will occur.
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Source: Tornado EF Scale.com <http://www.tornadoefscale.com/pages/t/tornadoefscale.com-index-nav-1.html>

Since the Enhanced Fujita Scale was introduced on February 1, 2007, there have only been two EF5 tornadoes recorded in the United States. The most recent one occurred in Parkersburg, Iowa on May 25, 2008 and leveled half the city.

4.9.2. Hazards Identified by Jurisdiction:

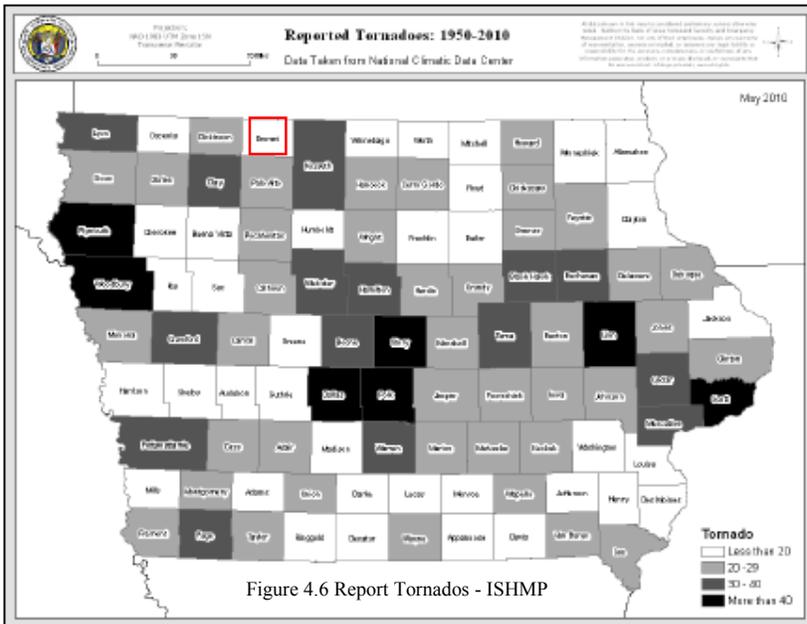
The table below shows which jurisdictions identified tornado as a hazard they are susceptible to.

	Unincorporated Emmet County	Armstrong	Dolliver	Estherville	Gruver	Ringsted	Wallingford	Iowa Lakes College
Tornado	X	X	X	X	X	X	X	X

4.9.3. Probability:

The committee determined that it would be an ‘Occasional’ tornado to affect the county. They believe there is a 10-20% chance for one to occur any given year. With the recorded NCDC data that have one occur every other year.

The following map depicts a geographic breakdown of reported tornadoes in Iowa from 1950-2010.



The following table shows that there have been four tornado events reported in Emmet County since 2003. These tornadoes resulted in 0 reported injuries and 0 deaths. Total property damages were \$5,000 and crop damage totaled \$6,000. The highest magnitude tornado to strike the county was a F1.

Table 4.19

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	5.00K	6.00K
WALLINGFORD	EMMET CO.	IA	07/14/2003	20:08	CST	Tornado	F0	0	0	0.00K	1.00K
RINGSTED	EMMET CO.	IA	06/11/2004	14:50	CST	Tornado	F1	0	0	5.00K	5.00K
GRUVER	EMMET CO.	IA	06/20/2005	15:55	CST	Tornado	F0	0	0	0.00K	0.00K
ARMSTRONG	EMMET CO.	IA	08/10/2010	16:44	CST-6	Tornado	EF0	0	0	0.00K	0.00K
Totals:								0	0	5.00K	6.00K

Source: National Climate Data Center

4.9.4. Magnitude/Severity:

With a tornado you never know if it is going to hit a populated area or the rural county. The committee determined the level of severity to be ‘Limited’ to the county. There would most likely be a loss of utilities for up to one week and injuries depending on where the strike occurred. The NCDC recorded that in the 4 events of tornado that it caused \$11,000 of damage and no deaths or injuries.

The 2010 State of Iowa Hazard Mitigation Plan estimates Emmet County, has an estimation loss of \$51,633.33 due to tornado.

4.9.5. Warning Time

There is typically minimal or no warning time. The committee stated that you can tell that bad weather is approaching, but you can’t always tell if a storm is going to bring a tornado or not until it hits. That is why they typically use their sirens when any bad weather approaches the communities.

4.9.6. Duration

The duration of a tornado is going to be less than six hours, however the cleanup after event can sometimes last months depending on the size and the area populated that is affected.

4.9.7. Hazard Total Score: 2.2

4.10 Windstorm

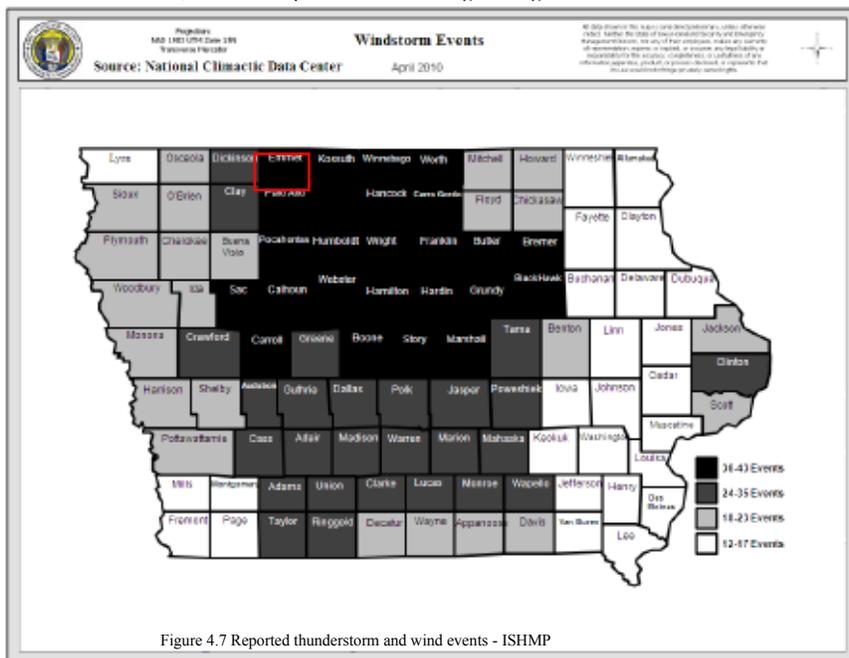
4.10.1 Definition and description:

Windstorms can be described as extreme winds associated with severe winter storms, severe thunderstorms, downbursts, and very steep pressure gradients. Windstorms, other than tornados, are experienced in all regions of the United States. It is difficult to separate the various wind components that cause damage from other wind-related natural events that often occur with or generate windstorms.

Although Iowa does not experience direct impacts from hurricanes, the state is no stranger to strong, damaging winds. Unlike tornadoes, windstorms may have a destructive path that is tens of miles wide and the duration of the event could range from hours to days. These events can produce straight line winds in excess of 64 knots causing some power outages, property damage, impaired visibility, and crop damage. Windstorms occur in every county in Iowa. Historically, windstorm events are associated with severe thunderstorms and blizzards. It is often difficult to separate windstorms and tornado damage when winds get above 64 knots.

The National Weather Service has developed a windstorm warning system similar to other events such as, tornado, winter storm, and thunderstorm. Watches are issued when conditions are favorable for windstorms to develop and they come 12 to 24 hours in advance. Advisories are issued when existing or imminent windstorms cover part or all of the area and pose a mere inconvenience. Windstorm warnings are issued when existing or imminent high winds cover part or all of the forecast area and pose a threat to life and property.

Based on historical averages, Iowa would expect to have about 15 to 20 wind events each year where wind speeds exceed 64 knots (73 mph). The map below presents the regional occurrences of windstorms in the State of Iowa. Since 1993, Iowa has experienced 204 strong and high wind events.



4.10.2. Hazards Identified by Jurisdiction: The table below shows which jurisdictions identified windstorm as a hazard they are susceptible to.

	Unincorporated Emmet County	Armstrong	Dolliver	Estherville	Gruver	Ringsted	Wallingford	Iowa Lakes College
Windstorm	X	X	X	X	X	X	X	X

4.10.3. Probability:

The committee determined that there is more than a 33% chance for a windstorm to affect the county. There have been 22 recorded NDCD events to happen in the past 13 years, which almost amounts to 1+ each year. The committee stated that with Emmet County being majorly flat like the rest off Iowa, that there are probably some more events that are recorded through the NDCD.

Table 4.20

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	865.00K	50.00K
EMMET (ZONE)	EMMET (ZONE)	IA	04/05/2000	12:30	CST	High Wind	50 kts. M	0	0	50.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	04/07/2001	04:00	CST	High Wind	70 kts. M	0	0	100.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	03/09/2002	06:00	CST	High Wind	M	0	0	50.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	05/11/2002	10:30	CST	High Wind	50 kts. E	0	0	75.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	08/16/2002	16:00	CST	High Wind	50 kts. E	0	0	50.00K	25.00K
EMMET (ZONE)	EMMET (ZONE)	IA	02/11/2003	13:15	CST	High Wind	50 kts. M	0	0	5.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	05/30/2003	14:00	CST	High Wind	35 kts. MS	0	0	25.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	11/12/2003	09:00	CST	High Wind	50 kts. EG	0	0	50.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	04/18/2004	15:10	CST	High Wind	52 kts. MG	0	0	80.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	10/30/2004	03:00	CST	High Wind	40 kts. MS	0	0	10.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	12/12/2004	10:00	CST	High Wind	35 kts. MS	0	0	50.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	01/22/2005	00:15	CST	High Wind	37 kts. MS	0	0	10.00K	0.00K
EMMET (ZONE)	EMMET	IA	11/12/2005	18:00	CST	High	35 kts.	0	0	50.00K	0.00K

	(ZONE)					Wind	MS				
EMMET (ZONE)	EMMET (ZONE)	IA	11/15/2005	19:00	CST	High Wind	35 kts. MS	0	0	30.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	01/24/2006	09:30	CST	High Wind	37 kts. MS	0	0	10.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	05/06/2007	04:30	CST-6	High Wind	56 kts. MG	0	0	25.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	06/05/2008	21:07	CST-6	High Wind	52 kts. EG	0	0	5.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	10/26/2008	09:30	CST-6	High Wind	52 kts. MG	0	0	25.00K	25.00K
EMMET (ZONE)	EMMET (ZONE)	IA	10/26/2010	14:53	CST-6	High Wind	50 kts. MG	0	0	0.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	04/09/2011	20:00	CST-6	High Wind	52 kts. MG	0	0	5.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	06/26/2011	20:40	CST-6	High Wind	61 kts. EG	0	0	150.00K	0.00K
EMMET (ZONE)	EMMET (ZONE)	IA	01/01/2012	01:00	CST-6	High Wind	38 kts. MS	0	0	10.00K	0.00K
Totals:								0	0	865.00K	50.00K

4.10.4. Magnitude/Severity:

The committee determined that a windstorm would be ‘Critical’ to the county. The damage that would result from a windstorm they determined was to be widespread down branches and trees and onto power lines and structures, loss of power lines and electricity, loss of shingles or roofs and/or shingles and/or windows, and crop damage of taller plants (i.e. corn). The Planning Committee indicated wind speeds of 64 knots (73 mph) or greater will cause substantial damage to structures, resulting in 26% to 50% of property severely damaged. Windstorms may have wind speeds equal to or greater than an F0 tornado and may approach the lower limits of an F1 tornado. The high wind speeds are likely to cause high profile vehicle accidents and result in injuries. Additionally, the high wind speeds may also cause injuries to workers employed outdoors and injuries resulting from structure damage and flying debris.

The 2010 State of Iowa Hazard Mitigation Plan estimates Emmet County, has an estimation loss of \$72,865.87 due to windstorm.

4.10.5. Warning Time:

The windstorms that cause the most damage have minimal warning time, or up to 6 hours warning.

4.10.6. Duration:

With Iowa’s normal weather conditions do its relatively flatness the committee determined that windstorms that could cause damage would last less than 6 hours.

4.10.7. Hazard Total Score: 3.4

4.11 Dam Failure

4.11.1 Definition and description:

Dam failure is the uncontrolled release of impounded water resulting in downstream flooding, which can affect life and property. Flooding, earthquakes, blockages, landslides, lack of maintenance, improper operation, and poor construction, vandalism, or terrorism cause dam failures. Dams are constructed for a variety of uses, including flood control, erosion control, water supply impoundment, hydroelectric power generation, and recreation.

Dams are classified into three (3) categories based on the potential risk to people and property should a failure occur. The classification may change over time because of development downstream from the dam since its construction. Older dams may not have been built to the standards of its new classification. Below are the hazard classifications defined by Iowa Department of Natural Resources (DNR):

- High Hazard – A structure shall be classified as high hazard if located in an area where failure may create a serious threat of loss of human life or result in serious damage to residential, industrial or commercial areas, important public utilities, public buildings, or major transportation facilities;
- Moderate (Significant) Hazard – A structure shall be classified as moderate hazard if located in an area where failure may damage isolated homes or cabins, industrial or commercial buildings, moderately traveled roads or railroads, interrupt major utility services, but without substantial risk of loss of human life. In addition, structures where the dam and its impoundment are of themselves of public importance, such as dams associated with public water supply systems, industrial water supply or public recreation, or which are an integral feature of a private development complex, shall be considered moderate hazard for design and regulatory purposes unless a higher hazard class is warranted by downstream conditions;
- Low Hazard – A structure shall be classified as low hazard if located in an area where damages from a failure would be limited to loss of the dam, loss of livestock, damages to farm outbuildings, agricultural lands, and lesser used roads, and where loss of human life is considered unlikely.

Dam hazard potential classifications have nothing to do with the material condition of a dam, only the potential for death and/or destruction due to the size of the dam, the size of the impoundment, and the characteristics of the area downstream of the dam. The Iowa Department of Natural Resources (DNR) tracks all dams in Iowa with a height of at least 25 feet or a total storage of at least 50 acre feet of water. The inventory excludes all dams less than six (6) feet high regardless of storage capacity and dams less than fifteen (15) acre feet of storage regardless of height.

Table 4.21

Dam Name State ID#	Owners	Hazard Level	County	Location	Nearest City & Distance (miles)	Dam Ht. (feet)	Max. Storage (acre-ft)
KOEKENHOFF DAM 3654	JULIE KOEKENHOFF	L	Emmet	NE,NW,S27,T098N,R33W	5	13	108
QUASTAD DAM 1554	DONALD QUASTAD	L	Emmet	,NW,S32,T100N,R34W	5	35	64
SCHACHERER DAM 2124	JERRY SCHACHERER	L	Emmet	,NE,S24,T098N,R34W	6	33	60
TONDERUM DAM 1509	OLVIN TONDERUM	L	Emmet	,NW,S08,T099N,R31W	5	21	69

The classification of dams may change over time because of development downstream from the structure since its construction. Older dams may not have been built to the standards of its new classification. Dam hazard potential classifications have nothing to do with the material condition of a dam, only the potential for

death or destruction due to the size of the dam, the size of the impoundment, and the characteristics of the area downstream of the dam. Currently 4 dams located in Emmet County are rated a low hazard risk.

4.11.2. Hazards Identified by Jurisdiction:

The table below shows which jurisdictions identified Dam Failure as a hazard they are susceptible to.

	Unincorporated Emmet County	Armstrong	Dolliver	Estherville	Graver	Ringssted	Wallingford	Iowa Lakes College
Dam Failure	X	X		X				

Only Unincorporated Emmet County, Armstrong and Estherville have identified dam failure as a hazard they are vulnerable to. The dams identified by these three jurisdictions are considered low hazard dams by the Iowa Department of Natural Resource. However, each community indicated if any one of these dams failed, then agricultural land and livestock would be susceptible to this hazard. Even though the amount of damage may be minimal due to dam failure; each jurisdiction felt it was important to recognize dam failure in the plan and the potential impacts of such a hazard and to limit development in and around these areas. Additionally, not studies have been conducted within the County to determine the precise impact of a dam failure. There are no dams in Emmet County that are located within city limits and portions of the county that are most vulnerable if a dam fails, are in the unincorporated county.

4.11.3. Probability:

Based on previous events of dam failure in Emmet County, the committee determined that there is an 'Unlikely' chance for a dam failure to occur. The committee determined that there is less than a 10% chance to occur on any given year(1 in 10 chance). There are no documented dam failures in the committees recollection.

4.11.4. Magnitude/Severity:

The committee determined that there would be 'Negligible' affect from a dam failure. There would be 10% in property damage, to those areas near or down stream from the dams. Mainly croplands are present near river or streams and would be lost first. Most buildings have been removed from low points near rivers or creeks in past years.

4.11.5. Warning Time:

There is minimal to no warning in the event of a dam failure. Even if regular maintenance and inspections are given to the dams, failure points can be missed and a failure can occur suddenly and without warning.

4.11.6. Duration:

Since all dams are of low level the committee determined that the duration would be less than 6 hours.

4.11.7. Hazard Total Score: 1.45

***No studies have been conducted to determine which structures would be damage due to a dam failure. It is unknown what number of structures would possibly be affected by an event. This will be reviewed in updates of this plan, to see if there is any information or studies available.**

4.12 Levee Failure

4.12.1 Definition and description:

The failure of a levee can be attributed to the loss of structural integrity of a wall, dike, berms, or elevated soil by erosion, piping, saturation, or under seepage causing water to inundate normally dry areas. Levees constructed of compacted clay with a high plasticity tend to crack during cycles of long dry spells, during heavy rainfalls that follow the dry spells; water fills the cracks and fissures. In addition to increasing the hydrostatic forces, the water is slowly absorbed by the clay causing an increase in the unit weight of the clay as well as a decrease in its shear strength. This results in a simultaneous increase of the slide (driving) forces and a decrease of the resisting (shear strength) forces.

4.12.2. Hazards Identified by Jurisdiction:

The table below shows which jurisdictions identified Levee Failure as a hazard they are susceptible to.

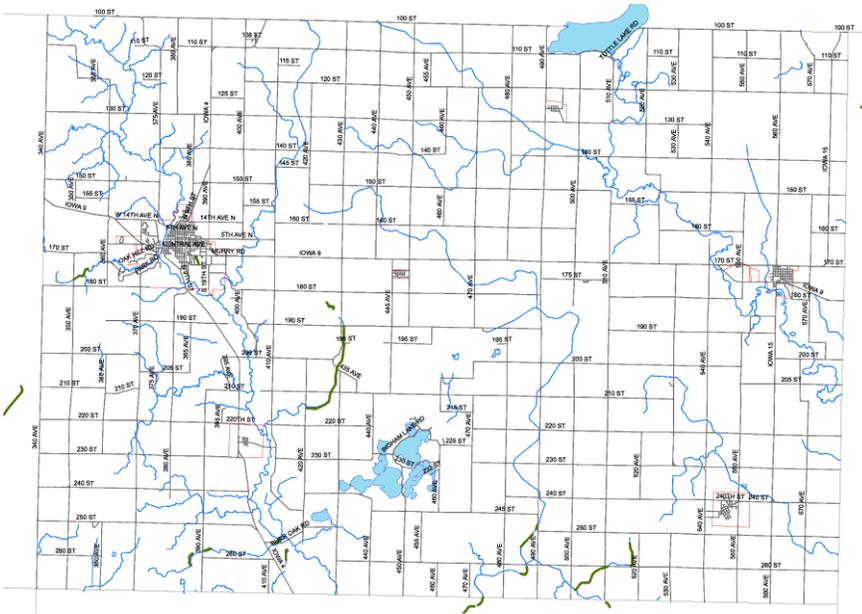
	Unincorporated Emmet County	Armstrong	Dolliver	Estherville	Gruver	Ringsted	Wallingford	Iowa Lakes College
Levee Failure	X			X		X	X	

Armstrong, Dolliver, Gruver did not have a concern of levee failure in their community and will not address them with mitigation actions. These communities don't have levees that would fail. The Cities of Estherville, Ringsted and Wallingford each identified having levees; however, it should be noted they defined their sewer lagoons as levees, whereas Armstrong and Gruver did not and Dolliver does not have wastewater lagoons. Unincorporated Emmet County identified agricultural ditches as levees. The definition and identification of levees will need to be more clearly examined and defined during the Plan's next update.

A search of the US Army Corps of Engineers National Levee Database finds no levees for Emmet County, Iowa. Additional research of the Iowa Department of Natural Resources using the Iowa Statewide LiDAR layer for Emmet County results in a map printed on the following page. This map is an Iowa Statewide LiDAR layer of Emmet County. The areas depicted in green illustrate where levees are located in the County. These levees, if indeed they are levees, are all in low-lying agricultural areas. Some Planning Committee members believe some agricultural ditches are considered levees. Roger Patocka, Emmet County Engineer reviewed the Map and indicated the map uses two (2) foot contours. He believed the "two (2) foot contours have mistaken the spoil banks of agricultural drainage ditches, which are built up higher when the ditches are cleaned by the drainage districts for levees". Roger goes on to say,

A levee is a natural or artificial (much more pronounced than a natural levee, and usually continuous without openings to the side) embankment to keep water moving on downstream to prevent local flooding. The local drainage ditches (with all the new agricultural pattern tiling being installed) are more quickly receiving drainage, and can overload the capacity of the old tiles and drainage ditches. Reverse flows (drainage water flowing backwards out of the tile is becoming more prevalent). The explosion in pattern tiling allows fields at the top of the collection area to drain more quickly, only to overtax the now undersized downstream tile system (bottleneck), and flooding ensues. We have a situation on N24 where water has overtopped the road twice in recent years, creating a hazard for emergency response vehicles. We replaced a 24" diameter culvert with a 36" diameter culvert. I observed water flowing out of two 16" tile riser on the exit side of a farmer's field. I conservatively assumed six inch head of water being discharged from one riser. The flow, over a twenty-four hour period, was calculated to add approximately nine inches of water to a nine acre area of field.

Terry Reekers, Emmet County Emergency Management, indicated "these levees are in most cases actually drainage ditches, but they can still cause flooding due to the explosion of tiling that is going on".



4.12.3. Probability:

The committee determined that an occasional levee failure could occur. That is roughly a 10% chance in any given year for one to occur. There haven't been any failure of recent history that have done considerable amount of damage. However the committee determined that most of the levees are old and are continuing to get older. That even with yearly maintenance is care, levees could one day give out and have the potential to causing damage. There have been no records keep on levee failures in the past.

4.12.4. Magnitude/Severity:

The severity that would come with a levee failure would be 'Negligible'. The committee determined that roughly 10% of property surrounding the levee. Typically the land around the levee is cropland or rivers/streams which could lead to crop damage or environmental pollution. A levee/agricultural ditch failure will impact a few acres of low-lying crop land or bottom area and potentially a low-lying area of a road.

4.12.5. Warning Time:

There is minimal or no warning time in the event of a levee failure. Even with yearly maintenance and care can't prevent levee failures.

4.12.6. Duration:

Levee failure would affect the community for more than a week if their sewer lagoons were to fail.

4.12.7. Hazard Total Score: 1.75

***No studies have been conducted to determine which structures would be damage due to a levee failure. It is unknown what number of structures would possibly be affected by an event. This will be reviewed in updates of this plan, to see if there is any additional information or studies available.**
**** Levees will be more thoroughly discussed and examined at the time of the Plan's review and update to determine if and precisely where levees exist in the County. It may be a matter of all planning members defining a levee in the same manner.**

Commented [d1]:

4.13 Grass or Wildland Fire

4.13.1 Definition and description:

A grass or wild-land fire is an uncontrolled fire that threatens life and property in either a rural or a wooded area. Grass and wild-land fires can occur when conditions are favorable, such as during periods of drought when natural vegetation would be drier and subject to combustibility. These events could also occur regularly from other natural occurrences such as lightning strikes.

4.13.2. Hazards Identified by Jurisdiction: The table below shows which jurisdictions identified grass or wildland fire as a hazard they are susceptible to.

	Unincorporated Emmet County	Armstrong	Dolliver	Estherville	Gruver	Ringsted	Wallingford	Iowa Lakes College
Grass or Wildland Fire	X	X	X	X	X	X	X	

* ILCC does not have a concern with grass or wildland fires do to their in town location.

4.13.3. Probability:

The committee determined that it is ‘Highly Likely’ for a grass or wildland fire to occur in Emmet County. It is likely that there is a 1 in 1 chance for this to occur any given year. The committee determined that each community which has a fire department goes to grass or wildland fires each, typically in the fall when famers harvesting the crops and working cropland. No exact number of responses of grass or wildland fires have been recorded, but the committee determined that each fire department responds to at least 4 calls a year.

4.13.4. Magnitude/Severity:

Of grass or wildland fire would be ‘Limited’ in the county. The committee determined that 10%-25% of property could be severely damaged. Most property that would be affected would be farm equipment, cropland, buildings close to croplands and fire response personnel and equipment.

Each committee was asked to designate on their critical facilities map which areas were most prone to grass or wildland fires. Most communities determined that those buildings closest to farm fields would be the most likely to be damaged by a wildland fire. The communities marked on their maps the areas most prone then estimated the type of structures and cost based on the average. The estimated buildings and value are presented below. It is to be known that grass or wildland fires are a natural hazard that usually occurs at unknown time and location, therefore these are just estimates in good faith to get the communities thinking of the possible outcomes for damages from grass or wildland fires. The maps are to be found in Section 9. It is to be noted that Emmet County did not determine damage estimates the same way as the communities determined, because of time and resources it was to large of task to determine that number, because again it is difficult to determine when and where and how much will be affected.

City	# of residential	Average Cost	# of Commercial, Industrial, others.	Average Cost	Total Lost Estimate
Armstrong	25	\$64,474	3	\$84,906	\$1,866,570
Dolliver	1	\$32,115	1	\$91,880	\$123,995
Estherville	60	\$69,518	1	\$28,120	\$4,199,222
Gruver	11	\$43,056	2	\$501,096	\$1,475,809
Ringsted	38	\$37,283	4	\$398,859	\$3,012,177
Wallingford	27	\$46,369	1	\$85,338	\$1,337,300

4.13.5. Warning Time:

There is minimal or no warning time in the event of a grass or wildland fire.

4.13.6. Duration:

Typically grass or wildland fires are less than one day. The committee determined that in most events

4.13.7. Hazard Total Score: 3.2

Section 5. Vulnerability

The methodology used to define vulnerability was to identify vulnerable structures in Emmet County and all jurisdictions participating in the Emmet County Hazard Mitigation Plan. All critical facilities and infrastructure were determined to be vulnerable by the planning team. Each jurisdiction planning team has identified critical facilities and infrastructure that could be in potential hazard areas. If any of these facilities were affected by a hazard, it would have a large affect on cities and the county to maintain current operations. The potential dollar losses for facilities are the most recent assessed value and are valuations for total structure loss. Vulnerability is also assessed by types and number of structures. Types of structural vulnerability expressed are: residential, commercial, industrial, agricultural and exempt (religious, utilities, education, government). These categories are used to show potential dollar losses to structural uses. The potential losses were used to show the vulnerability to critical facilities/infrastructure and structural uses in all hazard events investigated in this plan. Data limits were that no data was available for contents and functional loss of facilities. Sources used to identify valuations were the Emmet County Assessor for valuations of critical facilities. Vulnerability is also described in terms of a percentage or dollar amount of structural damage. The vulnerability percentages are based on the scoring criteria for severity in the Criteria Category Table at the beginning of Section 4. The magnitude/severity breakdown helped the planning team to decide the vulnerability percentages in relation to the hazards that were identified.

Table 5.1 - ASSESSING VULNERABILITY OF HAZARDS

* The county assessor supplied the following information to the best of their ability.

Emmet County Totals						
Type of Structure	Number of Structures		Value of Structures		Number of People	
	# in County	% in Hazard Area	\$ in County	% in Hazard Area	# in County	% in Hazard Area
Residential	4,227	100%	\$248,217,900	100%	10,302	100%
Commercial	691	100%	\$47,609,600	100%	*	*
Industrial	88	100%	\$26,024,400	100%	*	*
Agricultural	*	100%	\$35,585,500	100%	*	*
Exempt : Religious, Utilities Education, Govt,	*	100%	\$29,595,700	100%	*	*
	5,006		\$387,033,100		10,302	

Emmet County Rural Totals						
Type of Structure	Number of Structures		Value of Structures		Number of People	
	# in County	% in Hazard Area	\$ in County	% in Hazard Area	# in County	% in Hazard Area
Residential	1,059	100%	\$81,588,100	100%	2,237	100%
Commercial	115	100%	*	100%	*	*
Industrial	22	100%	*	100%	*	*
Agricultural	*	100%	\$35,585,500	100%	*	*
Exempt : Religious, Utilities Education, Govt,	*	100%		100%	*	*
	5,006				2,237	

City of Armstrong						
Type of Structure	Number of Structures		Value of Structures		Number of People	
	# in City	% in Hazard Area	\$ in City	% in Hazard Area	# in City	% in Hazard Area
Residential	390	100%	\$25,144,900	100%	926	100%
Commercial	100	100%	\$6,798,400	100%	*	*
Industrial	20	100%	\$3,390,300	100%	*	*
Exempt : Religious, Utilities Education, Govt,	*	100%	\$6,686,200	100%	*	*
	520		\$42,019,800		926	

City of Dolliver						
Type of Structure	Number of Structures		Value of Structures		Number of People	
	# in City	% in Hazard Area	\$ in City	% in Hazard Area	# in City	% in Hazard Area
Residential	40	100%	\$1,284,600	100%	66	100%
Commercial	10	100%	\$918,800	100%	*	*
Industrial	0	100%	\$0	100%	*	*
Exempt : Religious, Utilities Education, Govt,	*	100%	\$161,300	100%	*	*
	50		\$2,364,700		66	

City of Estherville						
Type of Structure	Number of Structures		Value of Structures		Number of People	
	# in City	% in Hazard Area	\$ in City	% in Hazard Area	# in City	% in Hazard Area
Residential	2,402	100%	\$166,983,100	100%	6,360	100%
Commercial	373	100%	\$39,337,700	100%	*	*
Industrial	22	100%	\$14,066,700	100%	*	*
Exempt : Religious, Utilities Education, Govt,	*	100%	\$67,893,685	100%	*	*
	2,797		\$288,281,185		6,360	

City of Gruver						
Type of Structure	Number of Structures		Value of Structures		Number of People	
	# in City	% in Hazard Area	\$ in City	% in Hazard Area	# in City	% in Hazard Area
Residential	41	100%	\$1,765,300	100%	94	100%
Commercial	7	100%	\$555,200	100%	*	*
Industrial	17	100%	\$3,166,000	100%	*	*
Exempt : Religious, Utilities Education, Govt,	*	100%	\$218,500	100%	*	*
	65		\$5,705,000		94	

City of Ringsted						
Type of Structure	Number of Structures		Value of Structures		Number of People	
	# in City	% in Hazard Area	\$ in City	% in Hazard Area	# in City	% in Hazard Area
Residential	208	100%	\$7,754,800	100%	422	100%
Commercial	57	100%	\$2,595,000	100%	*	*
Industrial	1	100%	\$157,900	100%	*	*
Exempt : Religious, Utilities Education, Govt,	*	100%	\$1,768,900	100%	*	*
	266		\$12,276,600		422	

City of Wallingford						
Type of Structure	Number of Structures		Value of Structures		Number of People	
	# in City	% in Hazard Area	\$ in City	% in Hazard Area	# in City	% in Hazard Area
Residential	87	100%	\$4,034,100	100%	197	100%
Commercial	29	100%	\$2,474,800	100%	*	*
Industrial	0	100%	\$	100%	*	*
Exempt : Religious, Utilities Education, Govt,	*	100%	\$653,100	100%	*	*
	116		\$7,162,000		197	

Source: Emmet County Assessor's Office and US Census 2010

5.2 Vulnerability Assessment and Critical Facilities

The following wording is from the Criteria Category Table found in the beginning of Section Four scoring section on severity: Negligible- Less than 10% of property severely damaged, shutdown of facilities and services for less than 24 hours, and/or injuries/illnesses treatable with first aid, Limited-10% to 25% of property severely damaged, shutdown of facilities and services for more than a week, and/or minor injuries/illnesses that do not result in permanent damage, Critical-25% to 50% of property severely damaged, shutdown of facilities and services for more than two weeks, and/or serious injuries/illnesses that result in permanent disability, Catastrophic- More than 50% of property severely damaged, shutdown of facilities and services for more than 30 days, and/or multiple deaths. Those severity percentages were estimated at 5%, 10%, 25% and 50%. The following hazards had a score of 1 for severity and were considered to have an estimated 5% of critical facilities and infrastructure vulnerable: Landslide, Dam Failure and Levee Failure. For the score severity of 2 and were considered to have an estimated 10% of critical facilities and infrastructures vulnerable: Drought, Extreme Heat, Flash Flood, Hailstorm, River Flood, Thunderstorm and Lightning, Tornado and Grass and Wildland Fire. The next hazards had a score of 3 for severity and were considered to have an estimated 25% of critical facilities and infrastructure vulnerable: severe winter storm and windstorm. No hazard had a score of 4 for severity, but it was still included in the chart which and was considered to have an estimated 50% of critical facilities and infrastructure vulnerable.

Emmet County

Facility Name	People at Facility at Peak Hours	Valuation (2013)	Severity 50% of Total Structure Value for the Following Hazard: None	Severity 25% of Total Structure Value for the following hazards: Severe Winter Storm and Windstorm	Severity 10% of Total Structure Value for the following hazards: Drought, Extreme Heat, Flash Flood, Hailstorm, River Flood, Thunderstorm and Lightning, Tornado and Grass and Wildland Fire	Severity 5% of Total Structure Value for the following hazards: Landslide, Dam failure and Levee Failure
Airport	1,000	\$1,121,800	\$560,900	\$280,450	\$112,180	\$56,090
Turtle Lake Campground	600	\$167,400	\$83,700	\$41,850	\$16,740	\$8,370
Wolden Park Campground	600	\$454,900	\$227,450	\$113,725	\$45,490	\$22,745
Iowa Lake Campground	150	\$43,000	\$21,500	\$10,750	\$4,300	\$2,150
Fort Defiance State Park & Campground	200	\$1,500,000	\$750,000	\$375,000	\$150,000	\$75,000
Ingham lake Bible Camp	200	\$122,000	\$61,000	\$30,500	\$12,200	\$6,100
Ringham Habitat	100	\$33,300	\$16,650	\$8,325	\$3,330	\$1,665
Maple Hill	100	\$264,600	\$132,300	\$66,150	\$26,460	\$13,230
Ingham Lake Estates	500	\$351,000	\$175,500	\$87,750	\$35,100	\$17,550
Huntington	100		\$0	\$0	\$0	\$0
102nd St/Iowa Lake	25	\$43,900	\$21,950	\$10,975	\$4,390	\$2,195
Tuttle Lake South	150	\$50,000	\$25,000	\$12,500	\$5,000	\$2,500
Tuttle Lake Northwest	100	\$50,000	\$25,000	\$12,500	\$5,000	\$2,500
Forest Ridge	150	\$139,700	\$69,850	\$34,925	\$13,970	\$6,985
Forest Ridge (Ingham)	100	\$404,900	\$202,450	\$101,225	\$40,490	\$20,245
Hoprig/Fertilizer Storage	20	\$424,000	\$212,000	\$106,000	\$42,400	\$21,200
Feed Mill	20	\$2,000,000	\$1,000,000	\$500,000	\$200,000	\$100,000
Day Break Foods	100	\$14,000,000	\$7,000,000	\$3,500,000	\$1,400,000	\$700,000
Rendering Plant	150	\$452,300	\$226,150	\$113,075	\$45,230	\$22,615
New Fashion Pork	100	\$2,936,500	\$1,468,250	\$734,125	\$293,650	\$146,825
C&G manufacturing	6	\$138,500	\$69,250	\$34,625	\$13,850	\$6,925
State Line Fertilizer	10	\$1,760,500	\$880,250	\$440,125	\$176,050	\$88,025

Plant						
Artswag Manufacturing	250	\$1,296,700	\$648,350	\$324,175	\$129,670	\$64,835
Waste Water Treatment Estherville	20	\$5,005,500	\$2,502,750	\$1,251,375	\$500,550	\$250,275
Waste Water Lagoon Gruver	4	\$34,000	\$17,000	\$8,500	\$3,400	\$1,700
Waste Water Lagoon Ringsted	4	\$28,700	\$14,350	\$7,175	\$2,870	\$1,435
Church Immanuel Lutheran	100	\$90,000	\$45,000	\$22,500	\$9,000	\$4,500
Natural Gas Pipe Line	6	\$30,400	\$15,200	\$7,600	\$3,040	\$1,520
Electrical Substation	6	\$10,000	\$5,000	\$2,500	\$1,000	\$500
Electrical Substation	6	\$10,000	\$5,000	\$2,500	\$1,000	\$500
Electrical Substation	6	\$10,000	\$5,000	\$2,500	\$1,000	\$500

Armstrong

Facility Name	People at Facility at Peak Hours	Valuation (2013)	Severity 50% of Total Structure Value for the Following Hazard: None	Severity 25% of Total Structure Value for the following hazards: Severe Winter Storm and Windstorm	Severity 10% of Total Structure Value for the following hazards: Drought, Extreme Heat, Flash Flood, Hailstorm, River Flood, Thunderstorm and Lightning, Tornado and Grass and Wildland Fire	Severity 5% of Total Structure Value for the following hazards: Dam failure
City Offices	10	\$77,500	\$38,750	\$19,375	\$7,750	\$3,875
Fire Dept/Outdoor warning siren	50	\$79,600	\$39,800	\$19,900	\$7,960	\$3,980
Medical Clinic	12	\$95,200	\$47,600	\$23,800	\$9,520	\$4,760
City Maintenance/Warning siren	4	\$22,500	\$11,250	\$5,625	\$2,250	\$1,125
Post Office	10	\$66,400	\$33,200	\$16,600	\$6,640	\$3,320
Public Works/Water Plant	4	\$10,500	\$5,250	\$2,625	\$1,050	\$525
Wastewater treatment plant	4	\$100,000	\$50,000	\$25,000	\$10,000	\$5,000
Electrical Substation	3	\$10,000	\$5,000	\$2,500	\$1,000	\$500
Public School - North Union	175	\$3,419,100	\$1,709,550	\$854,775	\$341,910	\$170,955
Retirement Home/Assisted Living	80	\$1,230,700	\$615,350	\$307,675	\$123,070	\$61,535
Lutheran Church	200	\$555,700	\$277,850	\$138,925	\$55,570	\$27,785
Catholic Church	150	\$413,300	\$206,650	\$103,325	\$41,330	\$20,665
Presbyterian Church	40	\$54,800	\$27,400	\$13,700	\$5,480	\$2,740
Methodist Church	100	\$202,600	\$101,300	\$50,650	\$20,260	\$10,130
Daycare Center	25	\$28,900	\$14,450	\$7,225	\$2,890	\$1,445
Library	6	\$244,700	\$122,350	\$61,175	\$24,470	\$12,235
Arts Way Manufacturing	120	\$1,296,700	\$648,350	\$324,175	\$129,670	\$64,835
GKN	170	\$1,950,000	\$975,000	\$487,500	\$195,000	\$97,500
State Line COOP/Fertilizer Plant	20		\$884,350	\$442,175	\$176,870	\$88,435
TG Industries	30	\$321,800	\$160,900	\$80,450	\$32,180	\$16,090
Galco	12	\$44,000	\$22,000	\$11,000	\$4,400	\$2,200
Pallets	Same as above	\$113,200	\$56,600	\$28,300	\$11,320	\$5,660
North Union Athletic Field	500	\$91,800	\$45,900	\$22,950	\$9,180	\$4,590
Iowa Electric Light and Power	5	\$102,300	\$51,150	\$25,575	\$10,230	\$5,115

Dolliver

Facility Name	People at Facility at Peak Hours	Valuation (2013)	Severity 50% of Total Structure Value for the Following Hazard: None	Severity 25% of Total Structure Value for the following hazards: Severe Winter Storm and Windstorm	Severity 10% of Total Structure Value for the following hazards: Drought, Extreme Heat, Flash Flood, Hailstorm, Thunderstorm and Lightning, Tornado and Grass and Wildland Fire	Severity 5% of Total Structure Value for the following hazards: None
Community Center, Well, City Offices, Water Plant	60	\$23,600	\$11,800	\$5,900	\$2,360	\$1,180
Methodist Church	200	\$64,100	\$32,050	\$16,025	\$6,410	\$3,205
Post Office	15	\$23,000	\$11,500	\$5,750	\$2,300	\$1,150
Waste Water Treatment Plant	2	\$200,000	\$100,000	\$50,000	\$20,000	\$10,000
Telephone	1	\$50,000	\$25,000	\$12,500	\$5,000	\$2,500

Estherville

Facility Name	People at Facility at Peak Hours	Valuation (2013)	Severity 50% of Total Structure Value for the Following Hazard: None	Severity 25% of Total Structure Value for the following hazards: Severe Winter Storm and Windstorm	Severity 10% of Total Structure Value for the following hazards: Drought, Extreme Heat, Flash Flood, Hailstorm, River Flood, Thunderstorm and Lightning, Tornado and Grass and Wildland Fire	Severity 5% of Total Structure Value for the following hazards: Landslide, Dam failure and Levee Failure
City Offices	20	\$809,900	\$404,950	\$202,475	\$80,990	\$40,495
Police / Courthouse	30	\$751,700	\$375,850	\$187,925	\$75,170	\$37,585
Fire Dept	26	\$143,600	\$71,800	\$35,900	\$14,360	\$7,180
Medical Clinic	50	With Hosp				
Hospital	100	\$1,651,400	\$825,700	\$412,850	\$165,140	\$82,570
County Shed	10	\$267,300	\$133,650	\$66,825	\$26,730	\$13,365
Post Office	10	\$243,100	\$121,550	\$60,775	\$24,310	\$12,155
EMS Ambulance Service	3	\$118,500	\$59,250	\$29,625	\$11,850	\$5,925
City Street Garage	2	\$150,864	\$75,432	\$37,716	\$15,086	\$7,543

High School	See 18c	\$12,986,600	\$6,493,300	\$3,246,650	\$1,298,660	\$649,330
Law Center	See 2a	\$824,300	\$412,150	\$206,075	\$82,430	\$41,215
Iowa Lakes College	1,000	\$5,256,400	\$2,628,200	\$1,314,100	\$525,640	\$262,820
Wastewater treatment Plant	7	\$4,180,500	\$2,090,250	\$1,045,125	\$418,050	\$209,025
Water Plant	4	\$246,300	\$123,150	\$61,575	\$24,630	\$12,315
City Wells - Well #4	0	\$252,800	\$126,400	\$63,200	\$25,280	\$12,640
Well #7	0	\$20,200	\$10,100	\$5,050	\$2,020	\$1,010
Well #8	0	With 10				
Well #9	2	\$1,100	\$550	\$275	\$110	\$55
Well #10	0	\$8,900	\$4,450	\$2,225	\$890	\$445
Electrical Substation	0	\$118,500	\$59,250	\$29,625	\$11,850	\$5,925
Water Tower at plant	4	\$294,357	\$147,179	\$73,589	\$29,436	\$14,718
West Tower	0	\$595,893	\$297,947	\$148,973	\$59,589	\$29,795
Standpipe Water Tower	0	\$278,368	\$139,184	\$69,592	\$27,837	\$13,918
Water Tower	0	\$458,048	\$229,024	\$114,512	\$45,805	\$22,902
Water Tower	0	\$535,587	\$267,794	\$133,896	\$53,559	\$26,779
Outdoor warning Sirens	0		\$0	\$0	\$0	\$0
Municipal Utilities Building (Elect Dist)	8	\$621,758	\$310,879	\$155,439	\$62,176	\$31,088
Power Plant	3	\$12,975,901	\$6,487,951	\$3,243,975	\$1,297,590	\$648,795
Natural Gas Border Station	0	\$29,700	\$14,850	\$7,425	\$2,970	\$1,485
Natural Gas Main	0		\$0	\$0	\$0	\$0
Roosevelt Elementary	200	All Schools				
Middle School	600	Combined				
High School	400	\$12,986,600	\$6,493,300	\$3,246,650	\$1,298,660	\$649,330
Demoney Elementary	400	With 18c				
ILCC	See 8c	See 8c				
Good Samaritan Retirement Home	100	\$443,216	\$221,608	\$110,804	\$44,322	\$22,161
Rosewood Manor Retirement Home	100	\$892,300	\$446,150	\$223,075	\$89,230	\$44,615
Trinity	200	\$790,200	\$395,100	\$197,550	\$79,020	\$39,510
Redeemer	200	\$575,900	\$287,950	\$143,975	\$57,590	\$28,795
Grandview	200	\$587,800	\$293,900	\$146,950	\$58,780	\$29,390
Estherville Lutheran	200	\$476,900	\$238,450	\$119,225	\$47,690	\$23,845
Christian Church	200	\$432,100	\$216,050	\$108,025	\$43,210	\$21,605
Church Of Christ	200	\$862,100	\$431,050	\$215,525	\$86,210	\$43,105
Emmanuel Lutheran	200	\$632,300	\$316,150	\$158,075	\$63,230	\$31,615
Catholic	200	\$1,476,300	\$738,150	\$369,075	\$147,630	\$73,815
Methodist	200	\$890,800	\$445,400	\$222,700	\$89,080	\$44,540
Presbyterian	300	\$882,500	\$441,250	\$220,625	\$88,250	\$44,125
Baptist	200	\$261,600	\$130,800	\$65,400	\$26,160	\$13,080
Gospel Assembly	200	\$350,000	\$175,000	\$87,500	\$35,000	\$17,500
Hispanic Church	50	\$40,900	\$20,450	\$10,225	\$4,090	\$2,045
Crossroads	200	\$409,100	\$204,550	\$102,275	\$40,910	\$20,455
Daycare	10	\$118,300	\$59,150	\$29,575	\$11,830	\$5,915
Library	50	\$2,113,500	\$1,056,750	\$528,375	\$211,350	\$105,675
College	See 8c	See 8c				
Community Center	100	See 1				

Hospital	100	See 3b				
Ferral Gas	5	\$41,200	\$20,600	\$10,300	\$4,120	\$2,060
Asmus Farm	10	\$348,600	\$174,300	\$87,150	\$34,860	\$17,430
Housemans	10	\$69,700	\$34,850	\$17,425	\$6,970	\$3,485
Eville Foods	100	\$3,229,000	\$1,614,500	\$807,250	\$322,900	\$161,450
Hazardous materials production						
GKN	200	\$3,450,000	\$1,725,000	\$862,500	\$345,000	\$172,500
Aero Wheels	60	\$819,900	\$409,950	\$204,975	\$81,990	\$40,995
Eville Foods	See 26d	See 26d				
Dakota Pack	30	\$583,600	\$291,800	\$145,900	\$58,360	\$29,180

Gruver

Facility Name	People at Facility at Peak Hours	Valuation (2013)	Severity 50% of Total Structure Value for the Following Hazard: None	Severity 25% of Total Structure Value for the following hazards: Severe Winter Storm and Windstorm	Severity 10% of Total Structure Value for the following hazards: Drought, Extreme Heat, Flash Flood, Hailstorm, Thunderstorm and Lightning, Tornado and Grass and Wildland Fire	Severity 5% of Total Structure Value for the following hazards: None
City Offices/Fire Dept	200	82,500	\$41,250	\$20,625	\$8,250	\$4,125
City Maintenance	3	12,700	\$6,350	\$3,175	\$1,270	\$635
Outdoor Warning Siren	n/a	12,000	\$6,000	\$3,000	\$1,200	\$600
Railroad	n/a					
Forest Ridge Youth Service	150	388,900	\$194,450	\$97,225	\$38,890	\$19,445
Hazardous Material Storage.	30	2,566,800	\$1,283,400	\$641,700	\$256,680	\$128,340
Back up Generator for Sewer	1	14,000	\$7,000	\$3,500	\$1,400	\$700

Ringsted

Facility Name	People at Facility at Peak Hours	Valuation (2013)	Severity 50% of Total Structure Value for the Following Hazard: None	Severity 25% of Total Structure Value for the following hazards: Severe Winter Storm and Windstorm	Severity 10% of Total Structure Value for the following hazards: Drought, Extreme Heat, Flash Flood, Hailstorm, Thunderstorm and Lightning, Tornado and Grass and Wildland Fire	Severity 5% of Total Structure Value for the following hazards: Levee Failure
City Offices	20	\$21,900	\$10,950	\$5,475	\$2,190	\$1,095
Fire Dept/Ambulance	40	\$38,700	\$19,350	\$9,675	\$3,870	\$1,935
City Maintenance	6	\$4,200	\$2,100	\$1,050	\$420	\$210
Post Office	15	\$40,400	\$20,200	\$10,100	\$4,040	\$2,020
Wastewater Treatment	2	\$28,700	\$14,350	\$7,175	\$2,870	\$1,435
Water Plant	4	\$3,200	\$1,600	\$800	\$320	\$160
240 th St	0	n/a				
City Well	2	\$15,000	\$7,500	\$3,750	\$1,500	\$750
Water tower/Siren	2	\$230,700	\$115,350	\$57,675	\$23,070	\$11,535
Church	300	\$180,500	\$90,250	\$45,125	\$18,050	\$9,025
Church	250	\$13,500	\$6,750	\$3,375	\$1,350	\$675
Library	50	\$50,000	\$25,000	\$12,500	\$5,000	\$2,500
Hazardous Material Storage	10	\$36,000	\$18,000	\$9,000	\$3,600	\$1,800
Anhydrous Building	6	\$75,000	\$37,500	\$18,750	\$7,500	\$3,750
Dukes	6	\$50,000	\$25,000	\$12,500	\$5,000	\$2,500
County Maintenance	6	\$75,000	\$37,500	\$18,750	\$7,500	\$3,750

Wallingford

Facility Name	People at Facility at Peak Hours	Valuation (2013)	Seventy 50% of Total Structure Value for the Following Hazard: None	Seventy 25% of Total Structure Value for the following hazards: Severe Winter Storm and Windstorm	Seventy 10% of Total Structure Value for the following hazards: Drought, Extreme Heat, Flash Flood, Hailstorm, River Flood, Thunderstorm and Lightning, Tornado and Grass and Wildland Fire	Seventy 5% of Total Structure Value for the following hazards: Levee Failure
City Offices	25	\$158,900	\$79,450	\$39,725	\$15,890	\$7,945
Post Office	7	\$116,800	\$58,400	\$29,200	\$11,680	\$5,840
EMS/Ambulance	9	\$109,500	\$54,750	\$27,375	\$10,950	\$5,475
Railroad	n/a		\$0	\$0	\$0	\$0
Airport	6	\$57,200	\$28,600	\$14,300	\$5,720	\$2,860
Wastewater Treatment Plant	4	\$14,700	\$7,350	\$3,675	\$1,470	\$735
City Wells	5	\$10,000	\$5,000	\$2,500	\$1,000	\$500
Natural Gas Border Station	2	\$10,000	\$5,000	\$2,500	\$1,000	\$500
Church	150	\$339,900	\$169,950	\$84,975	\$33,990	\$16,995
Library	25	\$49,400	\$24,700	\$12,350	\$4,940	\$2,470
Community Center	90	\$28,400	\$14,200	\$7,100	\$2,840	\$1,420
Hazardous Material Storage	6	\$20,000	\$10,000	\$5,000	\$2,000	\$1,000

Iowa Lakes Community College

Facility Name	People at Facility at Peak Hours	Valuation (2013)	Seventy 50% of Total Structure Value for the Following Hazard: None	Seventy 25% of Total Structure Value for the following hazards: Severe Winter Storm and Windstorm	Seventy 10% of Total Structure Value for the following hazards: Drought, Extreme Heat, Hailstorm, and Thunderstorm and Lightning, Tornado	Seventy 5% of Total Structure Value for the following hazards: None
Iowa Lakes Community College – Estherville Campus	1,000	\$5,256,400	\$2,628,200	\$1,314,100	\$525,640	\$262,820

Section 6. Hazard Mitigation Goals

The participating jurisdiction planning committees identified the mitigation plan goals. The committee developed broad-based goals that would address a large number of hazards and cover a variety of mitigation activities. The hazard mitigation plan goals identified are as follows:

Goals to help reduce or avoid long term vulnerabilities to identified natural hazards.	
1.	Natural hazards that cause injuries, illness, deaths, property loss, utility service disruption and economic loss will be reduced and mitigated against by planning for the protection of property and life.
2.	Protect the critical facilities and infrastructure damage due to natural hazards
3.	Educate the public on natural hazards and what necessary information is needed to protect themselves and their property.

The purpose of establishing goal statements is to set a general guideline for eliminating or reducing the long-term effects to property and life, reducing costs of response and recovery and minimizing disruption to all of Emmet County following a natural hazard event. Goal statements do not spell out specific strategies that can be measured but are written in general terms. Mitigation actions or measures are designed to be measured. The subsections of the hazards worksheets sections, i.e., historical occurrence, probability, vulnerability, maximum extent, severity, and speed of onset (which form the methodology of the assessment) were consulted as necessary.

The individual jurisdictions accepted the goals for each of their respective communities.

The following two tables are showing the abbreviations used for the local jurisdictions and a number system for the natural hazards.

Emmet County	=	EC	Gruver	=	GR
Armstrong	=	AR	Ringsted	=	RI
Dolliver	=	DO	Wallingford	=	WA
Estherville	=	EV	College	=	CC

1	=	Drought	8	=	Thunderstorm and Lightning
2	=	Extreme Heat	9	=	Tornado
3	=	Flash Flood	10	=	Windstorm
4	=	Hailstorm	11	=	Dam Failure
5	=	Landslide	12	=	Levee Failure
6	=	River Flood	13	=	Grass of Wildland Fire
7	=	Severe Winter Storm			

SECTION 6.1 MITIGATION ACTIONS

To be able to complete or help meet the goals of the Emmet County Multi-Hazard Mitigation Plan, different mitigation measures were developed. The following table shows those mitigation actions and what actions are to be followed by what entity.

Mitigation Action	Community Choosing this Mitigation	Hazard Addressed	Category	Goal
Enforce Tree Trimming	EC, AR, DO, EV, RI, WA	4, 7, 8, 9, 10	Prevention	1, 2
Back up Power Generators (buy)	EC, AR, EV, GR, RI, WA, CC	2, 3, 4, 7, 8, 9, 10	Emergency Services	1, 2
Bury Utility Lines	EC, AR, EV, GR, RI, WA	4, 7, 8, 9, 10, 13	Prevention	1, 2
NOAA Weather Radios (buy /distribute)	EC, AR, DO, EV, RI, WA	2, 3, 4, 6, 7, 8, 9, 10, 13	Public Education Awareness	1, 3
Designating Community Shelter	EC, AR, DO, EV, GR, RI, WA	2, 3, 6, 7, 8, 9, 10	Public Education Awareness	1, 3
Purchase Snow Plow/Truck	AR, EV, GR, RI, WA	7	Prevention	1
Good Neighbor Program	AR, DO, EV, GR, RI, WA	2, 3, 4, 7, 8, 9, 10	Public Education Awareness	1, 3
Tornado Safe Room (build)	AR, EV, WA, CC	8, 9, 10	Structural Projects	1, 2
Outdoor Warning Sirens (build or update)	EC, AR, DO, EV, GR, RI, WA, CC	4, 8, 9, 10	Structural Projects	1, 3
Watershed study & Implement	EC, EC, WA	3, 6	Natural Resource Protection	1
Promote Landscaping Practices	EV, WA	5, 6	Prevention	1
Building/Zoning Codes	EC, AR, EV, GR, WA	3, 5, 6, 13	Public Education Awareness	1, 3
Continue HAZMAT Training (Mason City)	EC, AR, EV, GR, RI, WA	8, 9, 10, 13	Emergency Services	1, 3
Continue Fire Dept Training	EC, AR, EV, GR, RI, WA	3, 6, 7, 9, 10, 13	Emergency Services	1, 3
Snow Removal Policy	EC, AR, DO, EV, GR, RI, WA	7	Prevention	1
List of Storm Shelters	EC, EV, GR, WA	4, 7, 8, 9, 10	Public Education Awareness	1, 3
Public Education/Awareness	EC, AR, DO, EV, GR, RI, WA, CC	ALL	Public Education Awareness	3
Maintain Outdoor Warning Sirens	EC, AR, EV, GR, RI, WA	4, 8, 9, 10	Structural Projects	1, 3
Update/Create Local Emergency Plan	EC, AR, EV, RI, WA	ALL	Prevention	1, 3
Clean/Enlarge Sewage Lagoons	AR, GR, RI, WA	3, 12	Structural Projects	1, 2
Construct Sewer Lift Station	AR, DO, WA	3	Structural Projects	1, 2
Replace Sewer Lines	EC, AR, EV, GR, RI, WA	3, 6	Structural	1, 2

			Projects	
Install Riprap	WA	5, 6	Structural Projects	1
Look into NFIP Participation	AR, DO, GR, RI	3, 6	Prevention	1, 3
Purchase Portable Pumps	EC, AR, EV, RI, WA	3, 6	Emergency Services	1, 2
Fire Gear PPE	EC, AR, EV, GR, RI, WA	3, 7, 8, 9, 10, 13	Emergency Services	1, 2
List of those of elderly, disabled or medically distressed	AR, EV, GR, RI, WA	2, 3, 4, 7, 8, 9, 10	Emergency Services	3
Shelter rations (cots, blankets, water, etc)	EC, AR, EV	8, 9, 10	Emergency Services	1, 3
Backup of City/County Records	EC, AR, EV, RI, WA	3, 6, 7, 8, 9, 10	Prevention	1, 2
Create Dry Hydrants	EC, AR, GR, WA	13	Structural Projects	1
Enforce Burn Bans	EC, AR, EV, RI, WA	1, 13	Prevention	1, 3
Affirm Rural Water Connection	EC, EV, GR, WA	1, 13	Prevention	1
Sandbags	EC, AR, EV, GR, WA	3, 6	Prevention	1, 2
Determine which areas are most prone to flood	EC, EV, GR, WA	3, 6	Prevention	1
Remain Compliant with NFIP	EC, EV, WA	3, 6	Prevention	1
Better Connection w/DNR	EC, AR	3, 6, 13	Prevention	1
Reaffirm Mutual AID	EC, AR, EV, GR, RI, WA	9, 13	Prevention	1
Paramedic equipment	AR, GR, WA	9, 13	Emergency Services	1
Maintain sand bagging plan	AR, EV	3, 6	Prevention	1, 3
Enforce Floodplain ordinance	EC, EV	3, 6	Prevention	1, 2
Test warning sirens monthly	EC, AR, EV, GR, RI	4, 8, 9, 10	Prevention	1, 3
Update Transmission Structures	EC	2, 4, 7, 8, 9, 10, 13	Structural Projects	1, 2
Maintain & expand debris removal site	EC, AR, EV, RI, WA	3, 4, 6, 7, 8, 9, 10	Prevention	1, 2
Monitor Levees and dams	EC, AR, EV, RI, WA	11, 12	Prevention	1, 2
Review/update Local operations Plan	AR, EV	ALL	Prevention	1
Deeper well	RI	1	Structural Projects	1
Water Restriction Plan	RI	1, 13	Prevention	1
Maintain Rescue Equipment	GR	3, 5, 6, 7, 8, 9, 10, 11	Emergency Services	1
Alternate Water Supply Plan	GR	1, 13	Prevention	1
Clean up equipment list	GR	3, 4, 5, 6, 7, 8, 9, 10, 13	Emergency Services	1
Fuel tanks for emergencies	GR	3, 6, 7, 8, 9, 10, 13	Emergency Services	1
Stream gauge monitoring system	EC	3, 6	Natural Resource Protection	1, 2
Energy Conservation program	EC	2	Prevention	1, 3
Improve water quality/quantity	EC, AR	1,	Structural Projects	1
Land stewardship	EC	3, 6, 13	Natural	1, 3

			Resource Protection	
Sustainable food production	EC	1, 2	Natural Resource Protection	1, 3

Mitigation Measures

The identified mitigation measures can be grouped into six categories. The Emmet County Mitigation Actions Table identifies which group a specific measure falls within.

Prevention

Government administrative or regulatory measures or processes that influence the way land and buildings are developed and built. These measures also include public activities to reduce hazard losses. Examples include:

- Planning and zoning
- Hazard mapping
- Building codes
- Subdivision regulations
- Studies/data collection and analysis to support prevention measures
- Floodplain regulations
- Storm water management regulations
- Multi-jurisdictional agreements that reduce hazard risks
- Other regulatory measures or processes that reduce hazard risks

Property Protection

Measures that involve modifying existing buildings or structures to protect them from a hazard, or removing buildings or structures from the hazard area or providing insurance to cover potential losses. Examples include:

- Acquisition, elevation, or relocation of hazard-prone property
- Safe room/storm shelter retrofits
- Security retrofits
- Critical facility protection
- Risk reduction retrofits (modifications) to hazard prone properties
- Studies/data collection and analysis to develop property protection measures
- National Flood Insurance Program (NFIP) participation

Public Education and Awareness

Measures to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them.

Examples include:

- Programs to improve awareness of hazard risk
- Programs to improve awareness of hazard risk prevention and reduction
- Education programs directed toward specialized audience, i.e. buildings, developers, and hazard prone neighborhoods

Natural Resource Protection

Measures that, in addition to minimizing hazard losses; preserve or restore the functions of natural systems.

Examples include:

- Sediment and erosion control
- Stream corridor restoration, watershed management
- Forest and vegetation management

- Wetland restoration and preservation

Emergency Services

Measures taken before, during and after a hazard event to protect people, and property; although these measures are not typically considered "mitigation, they significantly minimize the events impact and preserve the community's health and safety.

Examples include:

- Emergency/response facilities and personnel
- Hazard warning systems and equipment
- Health/safety/environmental risk prevention/reduction
- Emergency/response infrastructure
- Emergency/response planning
- Emergency/response training
- Emergency/response vehicles, equipment and protective gear
- Emergency/response services studies and data collection
- Emergency/response communication systems

Structural Projects

Measures that involve the construction and maintenance of structures and infrastructure that will reduce the impact of a hazard or redirect the impact away from people and property.

Examples include:

- Channel modification/maintenance
- Dam and reservoir construction/maintenance
- Levee and floodwall construction and maintenance
- Safe room construction
- Infrastructure construction and maintenance — roads and bridges
- Infrastructure construction and maintenance — utility systems
- Infrastructure construction and maintenance — urban and rural drainage systems
- Studies and data collection to develop structural projects

SECTION 6.2 STAPLEE

STAPLEE is an evaluation tool explained in the FEMA How to Guide, 386-3 to re-evaluate and prioritize mitigation measures. This tool is also used by local communities to evaluate and prioritize mitigation measures selected for inclusion in local mitigation plans. This is how the Emmet County Planning Team wished to evaluate the mitigation actions and strategies that were discussed in mitigation meetings. This acronym indicates the various factors that should be considered in planning decisions standing for Social, Technical, Administrative, Political, Legal, Economic, and Environmental elements.

Explanation of STAPLEE

S - Social

Is the proposed mitigation action acceptable to the community?
Will the measure treat all individuals and groups equitably?
Will the measure result in an inadvertent negative treatment of one or more segments of the population?

T - Technical

Will the measure reduce losses in the long-term?
Is the measure a whole or partial solution to the problem? Does the measure solve the problem instead of the symptoms?

A - Administrative

Do the agencies responsible for implementing the measure have the skill, experience, knowledge, ability, staffing, funding, and maintenance capability to do so?

P - Political

Does the measure have the support of elected officials, public or private agencies, and the general public?

L - Legal

Does the jurisdiction responsible for implementing the measure have the legal authority to do so?
Is there a legal basis (local code/ordinance, state law, or federal law] for the measure?

E - Economic

Do the measure's benefits exceed the costs?
Does the measure contribute to the overall economic goals of the community?
Are there current sources of funds to implement the measure?
Will the measure impose an increased burden on the tax base or the local economy?

E - Environmental

How does the measure impact the natural environment?
Does the measure comply with local, state, and federal environmental laws?
Is the measure consistent with current environmental goals?

Table 6.4 - STAPLEE

Hazard Addressed	Mitigation Action	S	T	A	P	L	E	E	Total Score
		Social	Technical	Administrative	Political	Legal	Economic	Environmental	
4, 7, 8, 9, 10	Enforce Tree Trimming	+	0	+	0	0	0	+	+3
2, 3, 4, 7, 8, 9, 10	Back up Power Generators (buy)	+	0	+	+	0	-	+	+3
4, 7, 8, 9, 10, 13	Bury Utility Lines	+	+	0	+	0	-	+	+3
2, 3, 4, 6, 7, 8, 9, 10, 13	NOAA Weather Radios (buy /distribute)	+	0	+	+	0	+	0	+4
2, 3, 6, 7, 8, 9, 10	Designating Community Shelter	+	0	+	+	0	0	0	+3
7	Purchase Snow Plow/Truck	+	0	+	+	0	-	0	+2
2, 3, 4, 7, 8, 9, 10	Good Neighbor Program	+	0	+	+	0	0	0	+3
8, 9, 10	Tornado Safe Room (build)	+	+	+	+	0	-	0	+3
4, 8, 9, 10	Outdoor Warning Sirens (build or update)	+	+	+	+	0	+	0	+5
3, 6	Watershed study & Implement	+	+	0	+	0	0	+	+4
5, 6	Promote Landscaping Practices	+	+	0	+	0	0	+	+4
3, 5, 6, 13	Building/Zoning Codes	+	0	+	+	0	0	0	+3
8, 9, 10, 13	Continue HAZMAT Training (Mason City)	+	0	+	+	0	+	0	+4
3, 6, 7, 9, 10, 13	Continue Fire Dept Training	+	0	+	+	0	+	0	+4
7	Snow Removal Policy	+	0	+	+	0	0	0	+3
4, 7, 8, 9, 10	List of Storm Shelters	+	0	0	+	0	0	0	+2
ALL	Public Education/Awareness	+	0	+	+	0	+	0	+4
4, 8, 9, 10	Maintain Outdoor Warning Sirens	+	+	+	+	0	0	0	+4
ALL	Update/Create Local Emergency Plan	+	0	+	+	0	0	0	+3
3, 12	Clean/Enlarge Sewage Lagoons	+	0	+	+	0	-	+	+3
3	Construct Sewer Lift Station	+	0	+	+	0	-	0	+2
3, 6	Replace Sewer Lines	+	0	+	+	0	-	+	+3
5, 6	Install Riprap	+	0	+	+	0	+	+	+5
3, 6	Look into NFIP Participation	+	+	+	+	0	0	+	+5
3, 6	Purchase Portable Pumps	+	0	+	+	0	-	0	+2
3, 7, 8, 9, 10, 13	Fire Gear PPE	+	0	+	+	0	+	0	+4
2, 3, 4, 7, 8, 9, 10	List of those of elderly, disabled or medically distressed	+	0	+	+	0	0	0	+3
8, 9, 10	Shelter rations (cots, blankets, water, etc)	+	0	+	+	0	0	0	+3
3, 6, 7, 8, 9, 10	Backup of City/County Records	+	0	+	+	0	0	0	+3
13	Create Dry Hydrants	+	0	+	+	0	0	0	+3
1, 13	Enforce Burn Bans	+	0	+	+	0	0	+	+4
1, 13	Affirm Rural Water Connection	+	0	+	+	0	0	0	+3
3, 6	Sandbags	+	0	+	+	0	+	0	+4
3, 6	Determine which areas are most prone to flood	+	+	+	+	0	0	+	+5
3, 6	Remain Compliant with NFIP	+	+	0	+	0	0	+	+4
3, 6, 13	Better Connection w/DNR	+	0	+	+	0	0	0	+3
9, 13	Reaffirm Mutual AID	+	0	+	+	0	0	0	+3
9, 13	Paramedic equipment	+	0	+	+	0	+	0	+4

Hazard Addressed	Mitigation Action	Social	Technical	Administrative	Political	Legal	Economic	Environmental	
3, 6	Maintain sand bagging plan	+	+	+	0	0	0	0	+3
3, 6	Enforce Floodplain ordinance	+	0	+	+	0	0	+	+4
4, 8, 9, 10	Test warning sirens monthly	+	+	+	0	0	0	0	+3
2, 4, 7, 8, 9, 10, 13	Update Transmission Structures	+	+	0	+	0	-	0	+2
3, 4, 6, 7, 8, 9, 10	Maintain & expand debris removal site	+	0	+	+	0	0	0	+3
11, 12	Monitor Levees and dams	+	+	0	0	0	-	+	+2
ALL	Review/update Local operations Plan	+	0	+	+	0	0	0	+3
1	Deeper well	+	+	0	0	0	-	0	+1
1, 13	Water Restriction Plan	+	0	0	0	0	0	+	+2
3, 5, 6, 7, 8, 9, 10, 11	Maintain Rescue Equipment	+	+	+	+	0	0	0	+4
1, 13	Alternate Water Supply Plan	+	0	+	0	0	0	+	+3
3, 4, 5, 6, 7, 8, 9, 10, 13	Clean up equipment list	+	+	+	0	0	0	0	+3
3, 6, 7, 8, 9, 10, 13	Fuel tanks for emergencies	+	+	0	0	0	-	0	+1
3, 6	Stream gauge monitoring system	+	+	0	0	0	0	+	+3
2	Energy Conservation program	+	0	+	0	0	0	+	+3
1,	Improve water quality/quantity	+	+	0	+	0	-	+	+3
3, 6, 13	Land stewardship	+	0	0	0	0	0	+	+2
1, 2	Sustainable food production	+	-	0	+	0	0	+	+2

6.3 Funding Sources and Average Cost of Mitigation Actions

Responsible Entity & Funding Source:

Responsible Entity, Cost Estimates and Funding Sources for Mitigation Actions		
Funding Source	Cost Estimates	Responsible Party
G- Grant B- Local Budget T- Local Time OS- Outside Source - other	Estimates were given by the Emmet County Hazard Mitigation Planning Team	<u>LL</u> - Local Jurisdiction (Clerk, Mayor, Council, Public Works) <u>FD</u> - Volunteer Fire Department <u>ST</u> - State of Iowa <u>HUD</u> - U.S. Dept. of Housing and Urban Development <u>HLSEM</u> - Iowa Homeland Security Emergency Management <u>FEMA</u> - Federal Emergency Management Agency <u>Hazmat</u> - Hazardous Materials Response Team from Mason City <u>IDOT</u> - Iowa Department of Transportation <u>NWS</u> - National Weather Service <u>EM</u> - Emmet County Emergency Management <u>UC</u> - Utility Company <u>PD</u> - Police Department/Sheriff
	Unknown	
	N/A-Little or No Known Additional Costs	

Table 6.5 – Cost, Funding Source, Responsibility

	Estimated Cost	Funding Source	Responsible Party
Enforce Tree Trimming	Varies	B, OS	LJ, UC
Back up Power Generators (buy)	\$50k-100K	G, B	LJ, EM
Bury Utility Lines	Millions	G, B, OS	LJ, UC
NOAA Weather Radios (buy /distribute)	\$40 a unit	G	EM
Designating Community Shelter	n/a	B	LJ, EM
Purchase Snow Plow/Truck	\$100-200k	G, B	LJ, IDOT
Good Neighbor Program	n/a	B, B	LJ, EM
Tornado Safe Room (build)	\$500, 000-1 million	G, B	LJ, EM, FEMA
Outdoor Warning Sirens (build or update)	\$10-20k per unit	G, B	LJ, EM
Watershed study & Implement	\$1,000,000	G, OS	DNR, EM
Promote Landscaping Practices			
Building/Zoning Codes	n/a	T	LJ
Continue HAZMAT Training (Mason City)	\$5-10,000	B, G	FD, EM
Continue Fire Dept Training	\$5,000	B	FD, EM
Snow Removal Policy	n/a	B, T	LJ, PD
List of Storm Shelters	n/a	T	LJ, EM, PD
Public Education/Awareness	\$2,000	B, T	LJ
Maintain Outdoor Warning Sirens	Varies	B	LJ, EM
Update/Create Local Emergency Plan	\$5,000+	B, G	EM, LJ
Clean/Enlarge Sewage Lagoons	\$1,000,000	G, B	LJ, UC, DNR
Construct Sewer Lift Station	\$250,000+	G, B	LJ, UC, DNR
Replace Sewer Lines	\$1,000,000+	G, B	LJ, UC
Install Riprap	\$10,000	B	DNR, LJ, EM
Look into NFIP Participation	n/a	B	LJ
Purchase Portable Pumps	\$20,000	G, B	FD, EM
Fire Gear PPE	\$5,000+	G, B	FD
List of those of elderly, disabled or medically distressed	n/a	T	PD, RD, LJ
Shelter rations (cots, blankets, water, etc)	\$5,000	G, B	EM, LJ
Backup of City/County Records	\$5,000	B	LJ
Create Dry Hydrants	\$120,000	G, B	FD, LJ
Enforce Burn Bans	n/a	B, T	LJ
Affirm Rural Water Connection	n/a	T	UC, LJ
Sandbags	\$50,000	G, B	EM
Determine which areas are most prone to flood	\$150,000	G, B, T	EM, DNR, LJ
Remain Compliant with NFIP	n/a	G, B, T	EM, LJ
Better Connection w/DNR	n/a	T	EM, LJ
Reaffirm Mutual AID	n/a	T	FD, PD, EM
Paramedic equipment	\$10,000+	G, B	FD, EM
Maintain sand bagging plan	N/A	G, B	EM, LJ
Enforce Floodplain ordinance	N/A	B, T	EM, DNR
Test warning sirens monthly	\$500,000	G, B	LJ, EM
Update Transmission Structures	Millions	G, OS	UC
Maintain & expand debris removal site	n/a	T, B	LJ, EM
Monitor Levees and dams	n/a	G, B, T	LJ, DNR
Review/update Local operations Plan	n/a	B, T	EM, LJ
Deeper well	\$100,000	G, B	DNR, UC
Water Restriction Plan	n/a	B, T	DNR, LJ
Maintain Rescue Equipment	\$50,000	G, B, OS	FD, PD
Alternate Water Supply Plan	Millions	G, B, OS	LJ, EM

Clean up equipment list	n/a	B, T	EM, FD, PD
Fuel tanks for emergencies	\$100,000	G, B	EM, FD, PD
Stream gauge monitoring system	\$50,000	G, OS	DNR
Energy Conservation program	Unknown	G, B, T, OS	UC, DNR
Improve water quality/quantity	Millions	G, OS	DNR
Land stewardship	Unknown	G	LJ
Sustainable food production	Unknown	G	EM, LJ, DNR

6.4 Priority of Mitigation Actions

Priority was established by each jurisdiction and displayed in the following table. The committees determined the level of priority into three groups of high, medium and low. They based this on the completed STAPLEE for each mitigation action, knowledge of future jurisdiction funds,

Priority Ranking

High (H) – Jurisdictions valued this as something that had the highest effect on helping the community and people survive severe weather events. Also the cost could be easily obtained or funding has already been set aside.

Medium (M) – These were valued at the jurisdictions as projects that where ranked in between the other two priority groups.

Low (L) – These mitigation actions have the least effect on protecting human life from severe weather events and therefore have been given the lowest priority. Or the cost is too high at this point in time and makes it unlikely to be acted upon in present future.

Implementation Schedule for the mitigation activities, whether ongoing or considered, will be subject to the availability of Federal, State, and local funding.

Continuing (ON) = Ongoing (responsible entity regularly participates in or supports)

Short Term (ST) = 1-5 years to initiate or accomplish

Long Term (LT) = 5 or more years to initiate or accomplish

ACTION	CITY	Unincorporated Emmet CO	Armstrong	Dolliver	Estherville	Gruver	Ringsted	Wallingford	Iowa Lakes CC
Enforce Tree Trimming		M ON	M ON	L ON	L ON		H ON	M ON	
Back up Power Generators (buy)		H ST	H LT		M ON	L LT	M ST	H LT	H LT
Bury Utility Lines		H ON	L LT		L ON	L LT	L ST	L LT	
NOAA Weather Radios (buy /distribute)		H ON	M ST	L ON	M ON		L ST	M ON	
Designating Community Shelter		H ON	H ST	L ON	L ON	M ON	L ST	L ST	
Purchase Snow Plow/Truck			M ON		L ON	L LT	L LT	L ON	
Good Neighbor Program			M ST	M ON	H ON	M ON	L ST	M ON	

Tornado Safe Room (build)		M LT		M LT			L LT	H LT
Outdoor Warning Sirens (build or update)	M ON	M LT	M ON	H ON	M ON	L ST	M ON	M LT
Watershed study & Implement	H ST			H ON			M ON	
Promote Landscaping Practices				L ON			L ON	
Building/Zoning Codes	M ON	M ON		H ON	M ON		M ON	
Continue HAZMAT Training (Mason City)	M ON	M ON		H ON	M ON	L ON	H ON	
Continue Fire Dept Training	H ON	M ON		H ON	M ON	M ON	H ON	
Snow Removal Policy	M ON	M ON	M ON	H ON	M ON	L ST	H ON	
List of Storm Shelters	M ST			H ON	M ST		L ON	
Public Education/Awareness	M ON	M ON	M ON	H ON	M ON	M ON	M ON	M ON
Maintain Outdoor Warning Sirens	H ON	M ON		H ON	M ON	L ST	M ON	
Update/Create Local Emergency Plan	H ON	H ON		H ON		L ST	H ON	
Clean/Enlarge Sewage Lagoons		M LT			L LT	L ST	L LT	
Construct Sewer Lift Station		M ON	L LT				L LT	
Replace Sewer Lines	H ON	L LT		H ON	L LT	M ST	L ON	
Install Riprap							M ON	
Look into NFIP Participation		L ST	L LT	H ON	L LT	L LT		
Purchase Portable Pumps	H ST	M ON		H ON		L ST	M ON	
Fire Gear PPE	H ST	M ON		H ON	M ON	L ST	H ON	
List of those of elderly, disabled or medically distressed		M ON		H ON	H ON	L ST	M ST	
Shelter rations (cots, blankets, water, etc)	H ST	L ON		L ON				
Backup of City/County Records	H ST	H ST		M ON		L ST	M ST	
Create Dry Hydrants	H ST	L ON			L LT		L LT	
Enforce Burn Bans	H ON	H ON		M ON		L ST	M ON	
Affirm Rural Water Connection	H ON			L ON	L ON		M ON	
Sandbags	H ST	H ON		L ON	L LT		L LT	
Determine which areas are most prone to flood	H ST			M ON	L LT		L ON	

Remain Compliant with NFIP	M ON			M ON			M ON	
Better Connection w/DNR	H ST	H LT						
Reaffirm Mutual AID	H ST	H ON		M ON	M ON	L ST	M ON	
Paramedic equipment		H ON			L LT		M ON	
Maintain sand bagging plan		M ON		L ON				
Enforce Floodplain ordinance	H ON			M ON				
Test warning sirens monthly	H ON	M ON		M ON	H ON	L ST		
Update Transmission Structures	H ST							
Maintain & expand debris removal site	H ST	M ON						
Monitor Levees and dams	L LT	L LT		L LT		L LT	L LT	
Review/update Local operations Plan		M ON		L ON				
Deeper well						L ST		
Water Restriction Plan						L ST		
Maintain Rescue Equipment					M ON			
Alternate Water Supply Plan					L ST			
Clean up equipment list					H ON			
Fuel tanks for emergencies					M ST			
Stream gauge monitoring system	H LT							
Energy Conservation program	H LT							
Improve water quality/quantity	M LT	M ON						
Land stewardship	H LT							
Sustainable food production	H LT							

Section 7. National Flood Insurance Program (NFIP)

In 1968, Congress created the National Flood Insurance Program (NFIP) to help provide a means for property owners to financially protect themselves. The NFIP offers flood insurance to homeowners, renters, and business owners if their community participates in the NFIP. Participating communities agree to adopt and enforce ordinances that meet or exceed FEMA requirements to reduce the risk of flooding.

The National Flood Insurance Program (NFIP) is administered by the Federal Emergency Management Agency (FEMA), which works closely with nearly 90 private insurance companies to offer flood insurance to property owners and renters. In order to qualify for flood insurance, a community must join the NFIP and agree to enforce sound floodplain management standards.

NFIP is a federal program that offers flood insurance which can be purchased through property and casualty insurance agents. Rates are set and do not differ from company to company or agent to agent. These rates depend on many factors, which include the date and type of construction of your home, along with your buildings level of risk.

The NFIP does more than make flood insurance available; it also supports local communities in their efforts to reduce the risk and consequences of serious flooding. In order to participate in the NFIP, a community must agree to adopt and enforce sound floodplain management regulations and ordinances. In exchange for these practices, FEMA makes flood insurance available to homeowners, business owners and renters in these communities.

Congress mandated federally regulated or insured lenders to require flood insurance on properties that are located in areas at high risk of flooding. A lender can require flood insurance, even if it is not federally required. Insurance requirements for different flood risk areas include: residents of high-risk areas and residents of moderate-to-low risk areas.

Residents of High-Risk Areas: Homes and buildings in high-risk flood areas with mortgages from federally regulated or insured lenders are required to have flood insurance. These areas have a 1% or greater chance of flooding in any given year, which is equivalent to a 26% chance of flooding during a 30-year mortgage.

Residents of Moderate-to-Low Risk Areas: Homes and businesses located in moderate-to-low risk areas that have mortgages from federally regulated or insured lenders are typically not required to have flood insurance. However, flood insurance is highly recommended because anyone can be financially vulnerable to floods. People outside of high-risk areas file over 20% of NFIP claims and receive one-third of disaster assistance for flooding. When it's available, disaster assistance is typically a loan you must repay with interest.

Building versus Contents Coverage

Flood insurance protects two types of insurable property: building and contents. The first covers your building, the latter covers your possessions; neither covers the land they occupy.

Building coverage includes:

- The insured building and its foundation
- The electrical and plumbing system
- Central air conditioning equipment, furnaces, and water heaters
- Refrigerators, cooking stoves, and built-in appliances such as dishwashers
- Permanently installed carpeting over unfinished flooring

Contents coverage includes:

- Clothing, furniture, and electronic equipment
- Curtains
- Portable and window air conditioners
- Portable microwaves and dishwashers
- Carpeting that is not already included in property coverage
- Clothing washers and dryers

The two most common reimbursement methods for flood claims are: Replacement Cost Value (RCV) and Actual Cash Value (ACV). The RCV is the cost to replace damaged property. It is reimbursable to owners of single-family, primary residences insured to within 80% of the buildings replacement cost. All other buildings and personal property (i.e. contents) are valued at ACV. The ACV is the RCV at the time of loss minus physical depreciation. Personal property is always valued using the ACV.

What a community must do to join NFIP

- Complete the application for participation in the National Flood Insurance Program(FEMA 81-64)
 - This application includes information such as the community name, chief executive officer, person responsible for administering the community’s floodplain management program, community repository for public inspection of flood maps and estimates of land area, population and number of structures in and out of the floodplain.
- Resolution of Intent
 - There must be a resolution of intent adopted, which indicates an explicit desire to participate in the NFIP and commitment to recognize flood hazards and carry out the objectives of the program.
- Floodplain Management Regulations
 - The community must adopt and submit floodplain management regulations that meet or exceed the minimum flood plain management requirements of the NFIP.

Below is a chart of the communities in Emmet County that are participating in the NFIP.

Table 7.1 NFIP Community Information

Community	Emmet County	Armstrong	Dolliver	Estherville	Gruver	Ringsted	Wallingford
CID	190865	190372	N/A	190124	N/A	190373	190821
Status	Participating	Not Participating	Not Participating	Participating	Not Participating	Not Participating	Participating
Initial Firm	9/30/88	N/A	N/A	10/14/77	N/A	N/A	7/01/87
Initial FHBM	5/20/77	N/A	N/A	3/29/74	N/A	N/A	9/26/75
Curr Eff Map Date	9/30/88m	N/A	N/A	10/14/77	N/A	N/A	7/1/87

In support of the NFIP, FEMA identifies flood hazard areas through the US and its territories by producing Flood Hazard Boundary Maps (FHNMs), Flood Insurance Maps (FIRMs) and Flood Boundary and Floodway Maps (FBFMs). Several areas of flood hazards are commonly identified on these maps. One of these areas is the Special Flood Hazard Area (SFHA) or high risk area defined as any land that would be inundated by a flood having a 1% chance of occurring any given year (also referred to as a the base flood level).

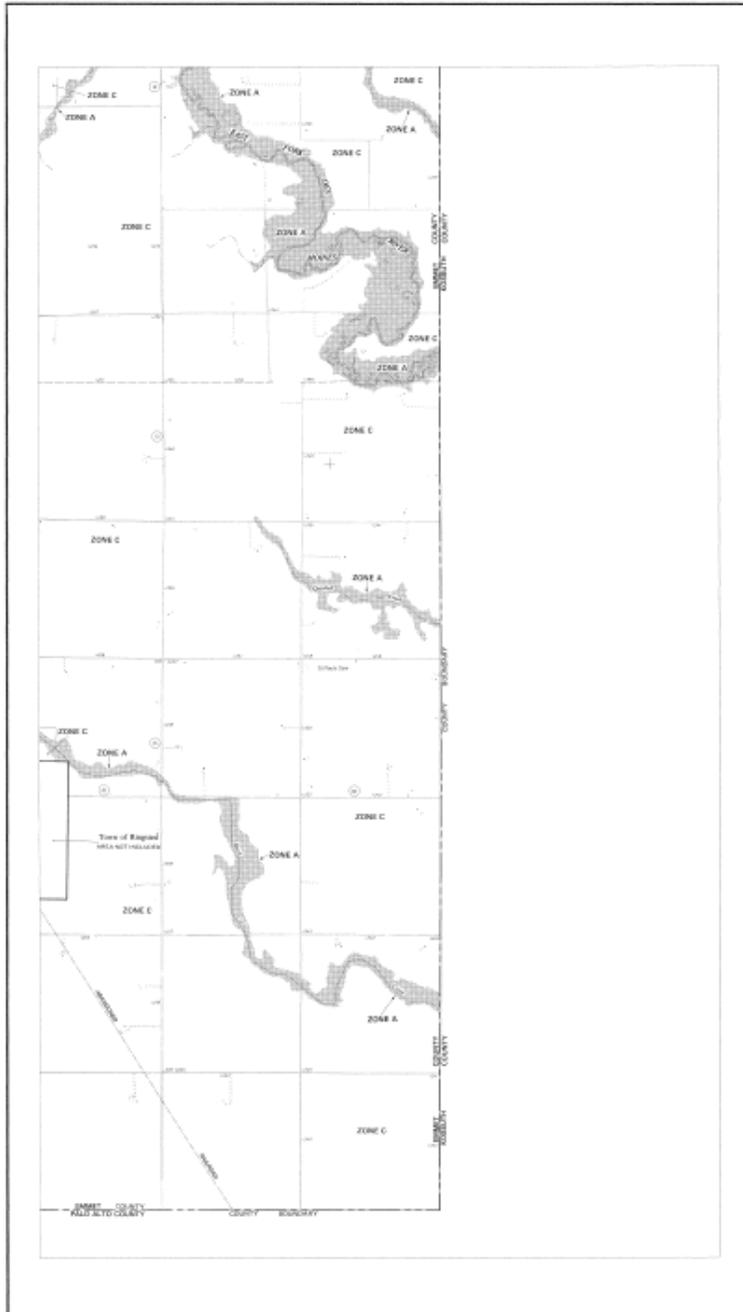
Participation in the NFIP is completely voluntary (although some states require NFIP participation as part of their flood plain management program) by cities and participation is on a community rather than an

individual basis. Participating in the program allows those who want to purchase flood insurance for their insurable property, whether it is a home or other property. Almost every type of walled and roofed building that is principally above ground and not entirely over water may be insured if it is in a participating community.

There are no repetitive losses properties present in Emmet County at the time of development of this plan.

Flood Map Follows:

Emmet County



KEY TO MAP

Zone Designation	ZONE C
Zone A	ZONE A
Zone B	ZONE B
Zone D	ZONE D
Zone V	ZONE V
Zone X	ZONE X
Zone Y	ZONE Y
Zone Z	ZONE Z

Map Flood Insurance Line
 2015 Flood Insurance Rate Map
 Date Flood Insurance Rate Map Issued: 09/26/15
 Effective Date: 09/26/15
 Zone B Boundary: 09/26/15
 Zone V Boundary: 09/26/15
 Zone X Boundary: 09/26/15
 Zone Y Boundary: 09/26/15
 Zone Z Boundary: 09/26/15

***EXPLANATION OF ZONE DESIGNATIONS**

ZONE	EXPLANATION
A	Area of moderate flood hazard where water depth is 1 to 3 feet and flow velocity is 1 to 3 feet per second. Flood damage is moderate to severe, but the flood hazard is not catastrophic.
B	Area of moderate flood hazard where water depth is 1 to 3 feet and flow velocity is 1 to 3 feet per second. Flood damage is moderate to severe, but the flood hazard is not catastrophic.
C	Area of moderate flood hazard where water depth is 1 to 3 feet and flow velocity is 1 to 3 feet per second. Flood damage is moderate to severe, but the flood hazard is not catastrophic.
D	Area of moderate flood hazard where water depth is 1 to 3 feet and flow velocity is 1 to 3 feet per second. Flood damage is moderate to severe, but the flood hazard is not catastrophic.
V	Area of moderate flood hazard where water depth is 1 to 3 feet and flow velocity is 1 to 3 feet per second. Flood damage is moderate to severe, but the flood hazard is not catastrophic.
X	Area of moderate flood hazard where water depth is 1 to 3 feet and flow velocity is 1 to 3 feet per second. Flood damage is moderate to severe, but the flood hazard is not catastrophic.
Y	Area of moderate flood hazard where water depth is 1 to 3 feet and flow velocity is 1 to 3 feet per second. Flood damage is moderate to severe, but the flood hazard is not catastrophic.
Z	Area of moderate flood hazard where water depth is 1 to 3 feet and flow velocity is 1 to 3 feet per second. Flood damage is moderate to severe, but the flood hazard is not catastrophic.

NOTES TO USER

Users are advised to consult the Flood Insurance Rate Map (FIRM) and the Flood Hazard Boundary Map (FHBM) for more information. The FIRM is the primary source of information for flood insurance rates. The FHBM is the primary source of information for flood hazard boundaries. For additional information, contact the Federal Emergency Management Agency (FEMA) at 1-800-453-3434.

OFFICIAL DESIGNATION
 SEPTEMBER 26, 2015
 FLOOD INSURANCE RATE MAP REVISION

FLOOD INSURANCE RATE MAP EFFECTIVE DATE
 SEPTEMBER 26, 2015
 FLOOD INSURANCE RATE MAP REVISION

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 800-453-3434.

APPROXIMATE SCALE
 1" = 100' FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

EMMET COUNTY, IOWA
 (UNINCORPORATED AREAS)

PANEL 250 OF 250

COMMUNITY PANEL NUMBER
 20803 0250 B

EFFECTIVE DATE:
 SEPTEMBER 26, 2015

Federal Emergency Management Agency



KEY TO MAP

Zone Designation

Zone C
Zone A
Zone E

See Flood Elevation List
 #10 Elevation to Top? 100-1001
 #20 Flood Elevation to Top
 #300 Elevation to Top
 #400 Elevation to Top
 #500 Elevation to Top
 #600 Elevation to Top
 #700 Elevation to Top
 #800 Elevation to Top
 #900 Elevation to Top
 #1000 Elevation to Top

EXPLANATION OF ZONE DEMONSTRATIONS

ZONE A Areas of moderate flood hazard. Flood elevations are based on the 100-year return period.

ZONE B Areas of moderate flood hazard. Flood elevations are based on the 100-year return period.

ZONE C Areas of moderate flood hazard. Flood elevations are based on the 100-year return period.

ZONE D Areas of moderate flood hazard. Flood elevations are based on the 100-year return period.

ZONE E Areas of moderate flood hazard. Flood elevations are based on the 100-year return period.

NOTE TO USER

These areas are in the Special Flood Hazard Area (SFHA) and are subject to flooding. This map is for flood insurance purposes only. It does not show areas of flood hazard or flooding to the maximum or at individual hazard levels. Special Flood Hazard Areas are shown on the National Flood Insurance Program (NFIP) maps.

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

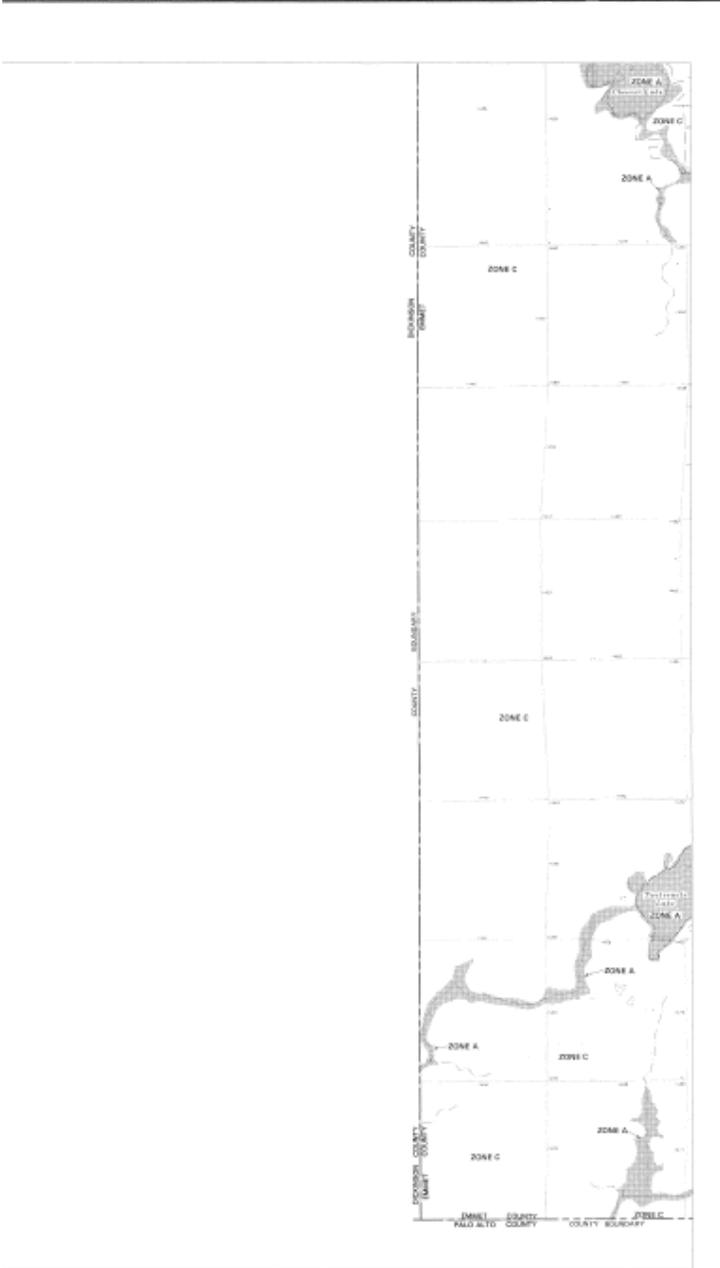
EMMET COUNTY, IOWA
(INCORPORATED AREAS)

PANEL 200 OF 250

COMMUNITY PANEL NUMBER
20000 0200 0

EFFECTIVE DATE:
SEPTEMBER 30, 1998

Federal Emergency Management Agency



KEY TO MAP

ZONE C
ZONE A
ZONE C

Map Projection: UTM
 Map Scale: 1:50,000
 Date: 1988
 Author: FEMA
 Date: 1988

EXPLANATION OF ZONE DESIGNATIONS

ZONE A
 Areas of 100-year flood hazard, flood insurance and flood damage prevention are required.

ZONE C
 Areas of 500-year flood hazard, flood insurance and flood damage prevention are not required.

ADDITIONAL INFORMATION
 Areas of 100-year flood hazard, flood insurance and flood damage prevention are required.

ADDITIONAL INFORMATION
 Areas of 500-year flood hazard, flood insurance and flood damage prevention are not required.

ADDITIONAL INFORMATION
 Areas of 100-year flood hazard, flood insurance and flood damage prevention are required.

ADDITIONAL INFORMATION
 Areas of 500-year flood hazard, flood insurance and flood damage prevention are not required.

NOTICE TO BUYERS

Consideration of flood insurance is advised in this community, unless your insurance agent or call the National Flood Insurance Program, at 800-352-7632.

NOTICE TO BUYERS

Consideration of flood insurance is advised in this community, unless your insurance agent or call the National Flood Insurance Program, at 800-352-7632.

NOTICE TO BUYERS

Consideration of flood insurance is advised in this community, unless your insurance agent or call the National Flood Insurance Program, at 800-352-7632.

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

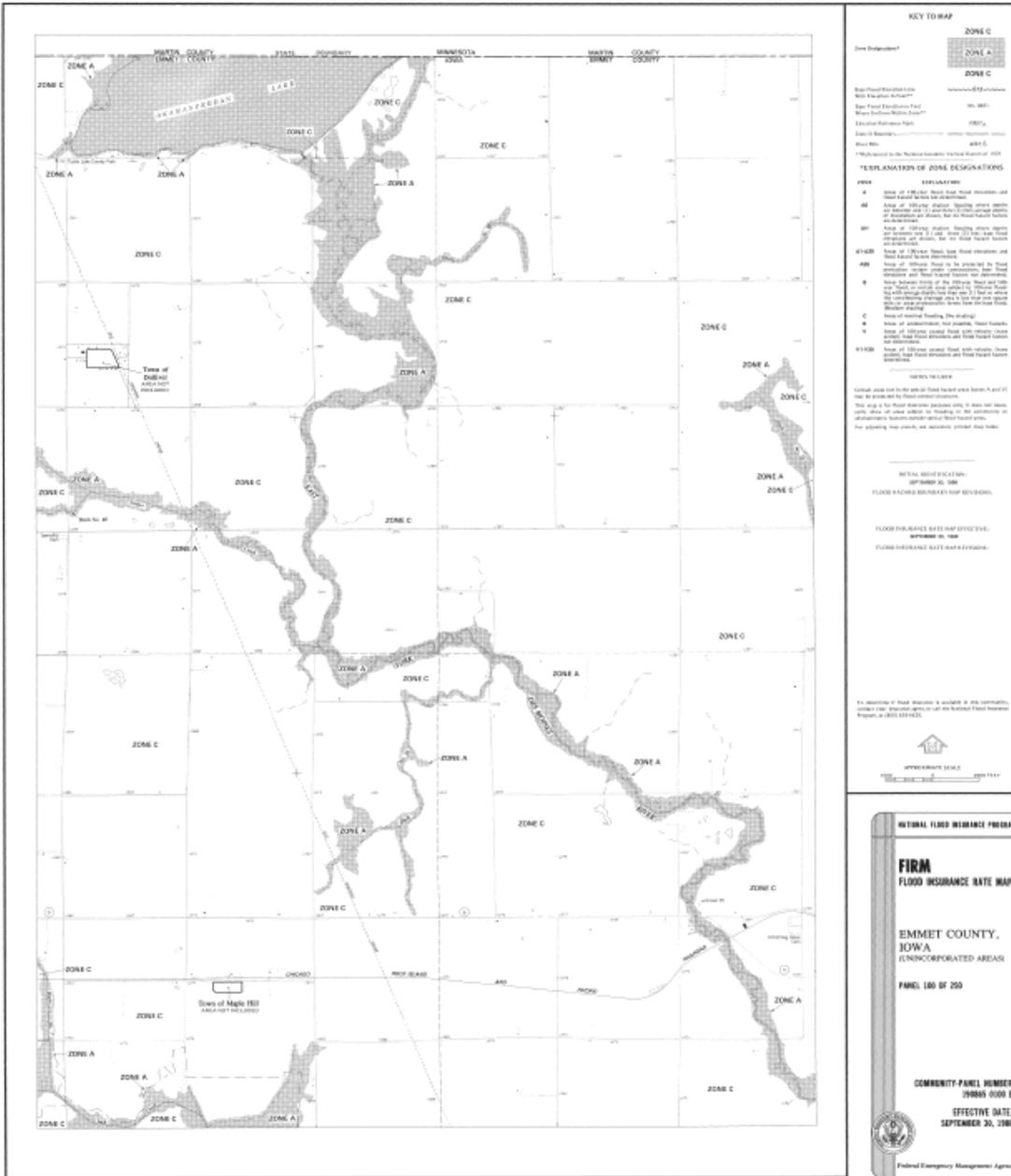
EMMET COUNTY, IOWA
 (UNINCORPORATED AREAS)

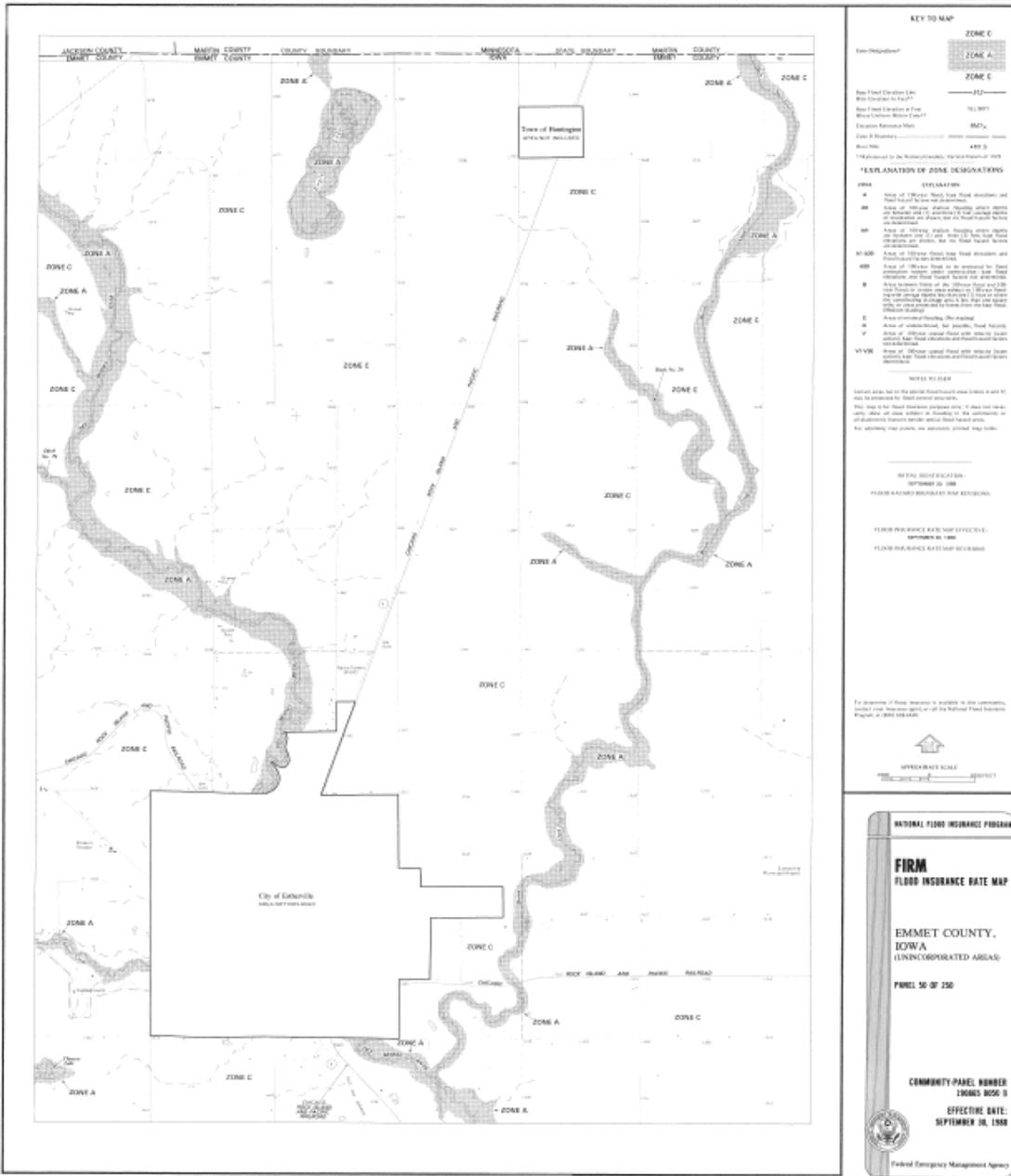
PANEL 156 OF 256

COMMUNITY PANEL NUMBER
 200803 0156 0

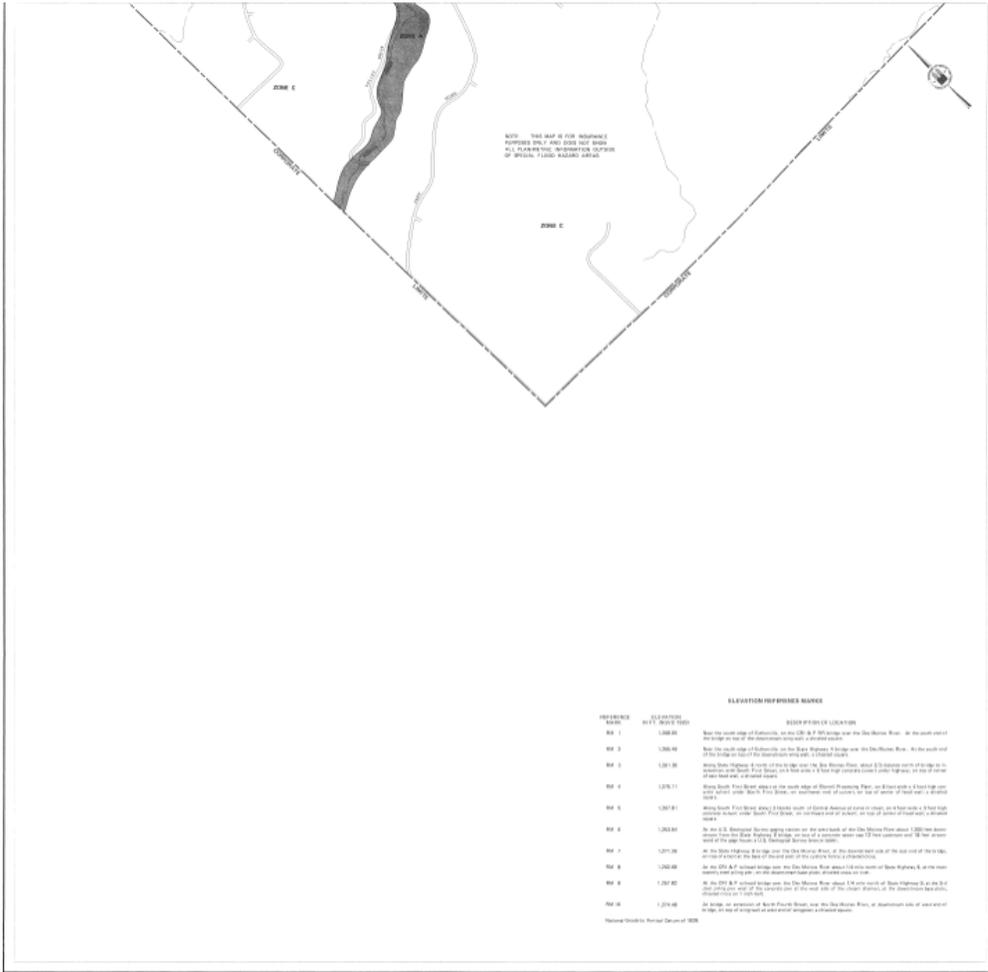
EFFECTIVE DATE:
 SEPTEMBER 30, 1988

Federal Emergency Management Agency





Estherville



KEY TO SYMBOLS

ZONE A

ZONE B

ZONE C

Other Symbols

Legend

Scale

North Arrow

Inset Map

ELEVATION REFERENCED NAME

REFERENCE MARK	ELEVATION IN FEET, MEAN SEA LEVEL	DESCRIPTION OF LOCATION
RM 1	1260.00	Top of east side of Estherville, on the OIA B.P. bridge over the Des Moines River. At the south end of the bridge on top of the observation tower. (vertical datum)
RM 2	1260.40	Top of east side of Estherville, on the Des Moines River. At the south end of the bridge on top of the observation tower. (vertical datum)
RM 3	1261.30	Top of east side of Estherville, on the Des Moines River. At the south end of the bridge on top of the observation tower. (vertical datum)
RM 4	1261.71	West Bank First Street, edge of the north side of River Fronting Park, on a 10-foot wide, 4-foot high concrete curb. (vertical datum)
RM 5	1262.81	West Bank First Street, edge of the north side of River Fronting Park, on a 10-foot wide, 4-foot high concrete curb. (vertical datum)
RM 6	1263.91	At the U.S. Highway 80 bridge over the Des Moines River about 1.50 mile upstream from the OIA B.P. bridge on the east side of the river. (vertical datum)
RM 7	1264.36	At the U.S. Highway 80 bridge over the Des Moines River, at the downstream side of the east end of the OIA B.P. bridge on the east side of the river. (vertical datum)
RM 8	1264.68	At the OIA B.P. bridge over the Des Moines River about 1.0 mile south of State Highway 80, at the east end of the bridge on the west side of the river. (vertical datum)
RM 9	1267.80	At the OIA B.P. bridge over the Des Moines River about 1.4 mile south of State Highway 80, at the east end of the bridge on the west side of the river. (vertical datum)
RM 10	1274.48	An bridge on a portion of the Des Moines River, on the Des Moines River, at downstream side of west end of bridge on top of approach on west side of bridge. (vertical datum)

Vertical Datum is Mean Sea Level of 1929.

FLOOD HAZARD BOUNDARY MAP 02-04

FLOOD HAZARD BOUNDARY MAP 02-04

ESTHERVILLE, IOWA

EMMET COUNTY

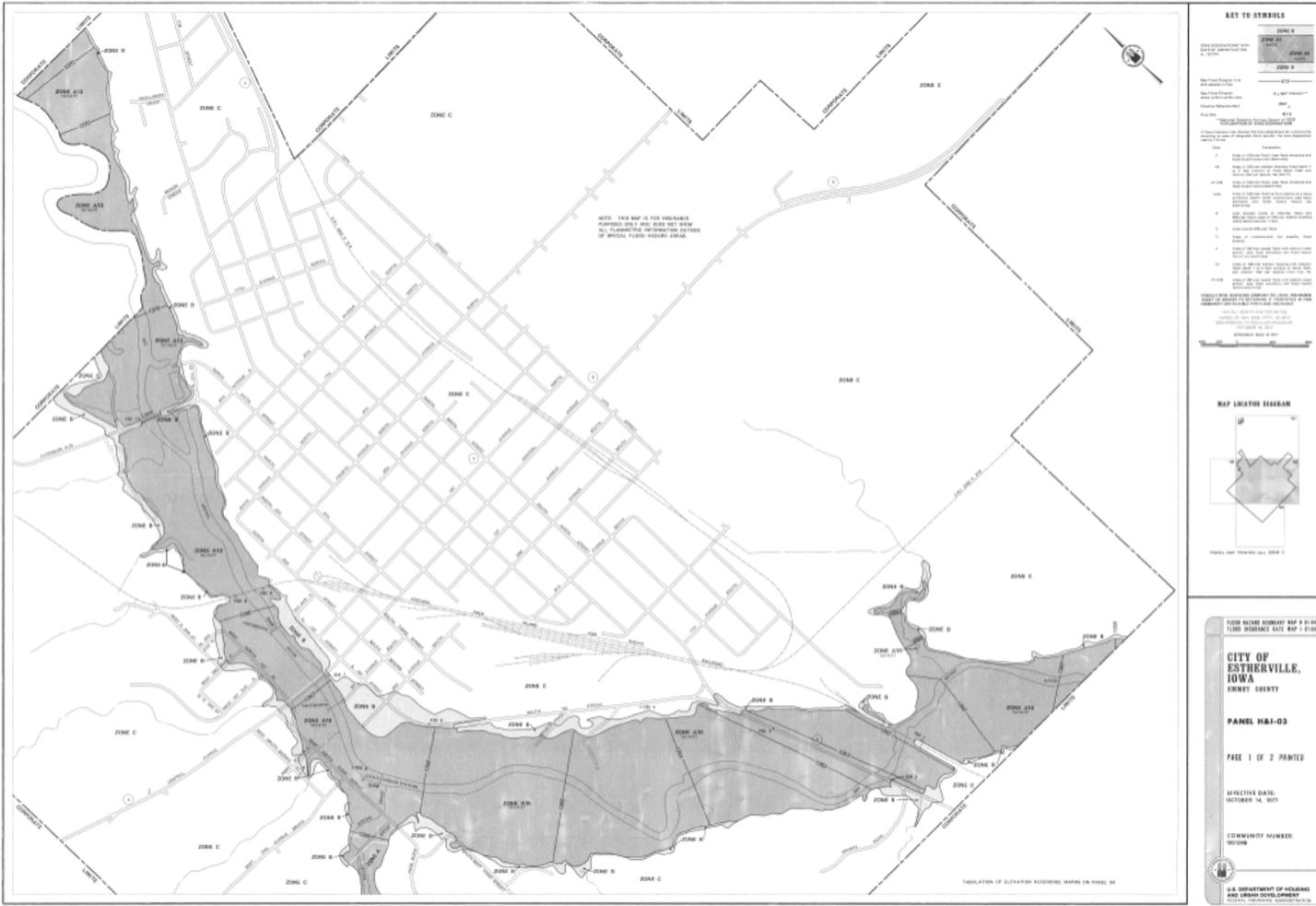
PANEL H&I-04

PAGE 2 OF 2 PRINTED

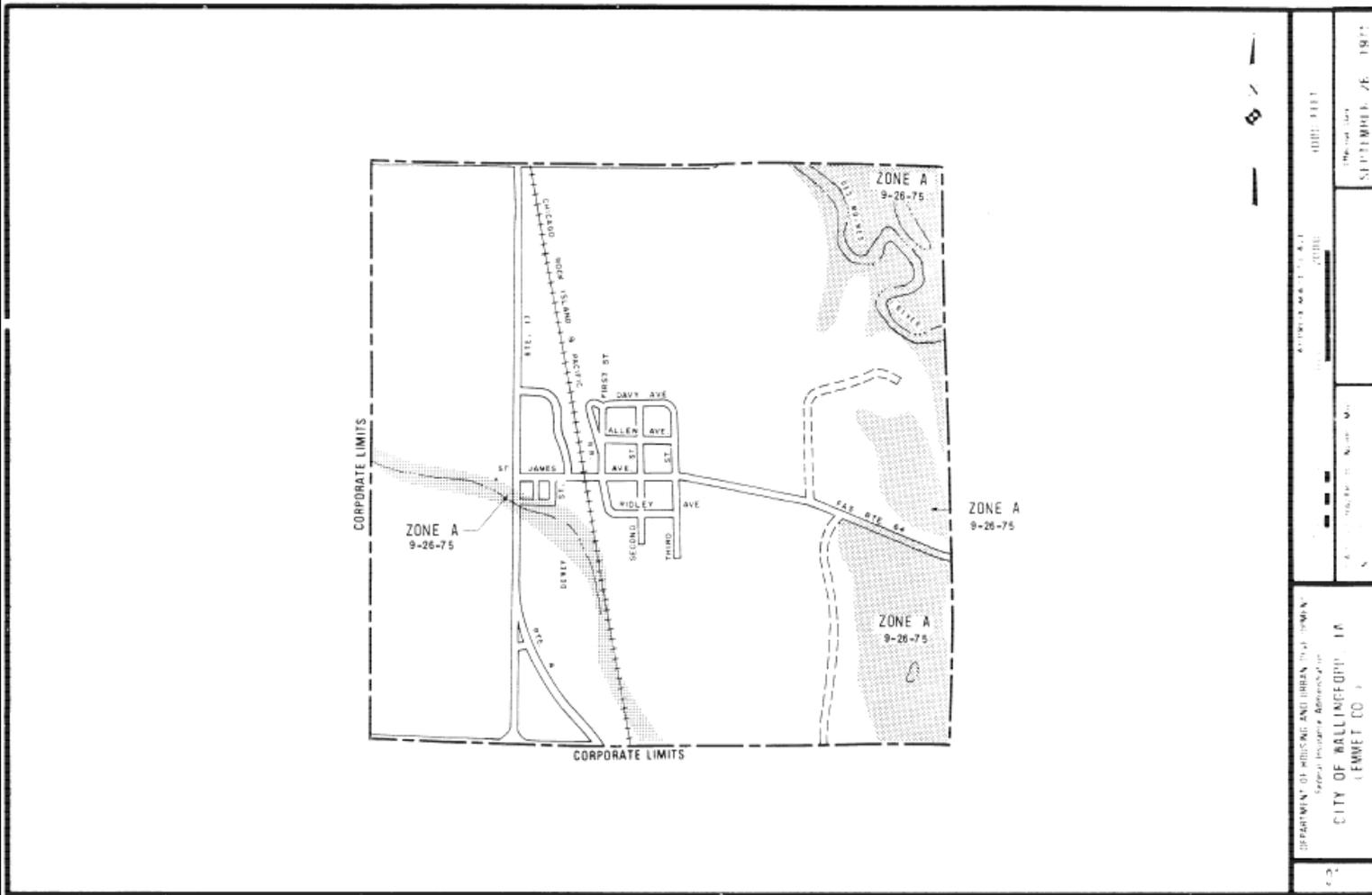
EFFECTIVE DATE:
OCTOBER 14, 2017

COMMITTEE NUMBER:
107016

U.S. DEPARTMENT OF COMMERCE
NOAA



Wallingford



Section 8. Plan Maintenance and Continued Involvement

The Emmet County Multijurisdictional Hazard Mitigation Plan shall be evaluated and updated at a minimum once every five (5) years for potential changes and compliance with FEMA rules and regulations. At a minimum, the five year update of the Emmet County Multijurisdictional Hazard Mitigation Plan will be completed to reflect community changes and compliance with FEMA or Iowa Homeland Security regulations. Each participating planning committee, to be comprised of representatives from city staff, members of the public, local businesses, school district representatives, elected officials and the Emmet County Emergency Management Director will be the responsible party for ensuring the review and evaluation of the city's mitigation plan. This local hazard mitigation planning committee will utilize the following criteria in monitoring and evaluating the effectiveness of the plan.

- Request and generate reports specific to city departments or other organizations or businesses within the community that are either responsible for or can contribute valuable information necessary to the successful implementation of this plan. The participating planning committees will meet and evaluate on an annual basis (1 year increments) and make the determination of whether additional reports are needed and by which agency or local organization.
- The each community hazard mitigation planning committees, will at its discretion, conduct site visits to places, businesses or locations within the community to evaluate and monitor progress on mitigation actions or projects.
- Each participating jurisdictions hazard mitigation planning committee, upon request of the City Council, shall provide the council, no more than once per year, a summary report of evaluation and implementation of mitigation actions.
- On an ongoing basis, the each of jurisdictions lead point of contact shall be deemed the overseeing and responsible position for ensuring the local hazard mitigation planning committee is reconvened and each jurisdiction in the plan is monitored on at least an annual basis. At the jurisdictions discretion, the community may also rely upon and request the assistance of the Emmet County Emergency Management Coordinator and other outside planning consultants who may be able to provide professional and technical assistance in monitoring and evaluating the successful implementation of the Emmet County Multijurisdictional Hazard Mitigation Plan.

8.1 EMMET COUNTY ANNUAL HAZARD MITIGATION PROGRESS MEETING

The Emergency Management Director, or other designee thereof, will invite the county and local hazard mitigation planning committee and additional members of the community to participate in future meetings regarding the update or amendment of the plan. Additionally, a public notice will be posted at Court House and City Halls inviting the general public to participate to review the plan and provide comments. Copies of the plan and the committee's review will be available at the Court House and City Halls. Following the planning committee's completion of the review process, the findings of the review and recommended changes, if applicable, will be presented during the City Council meeting. A public meeting will be held at that time. It is further recommended that the Emmet County hazard mitigation planning committee make every effort to review the goals and alternatives of this plan on an annual basis to determine their relevance (whether pertinent or current) to changing situations in the city as well as changes in state or federal policy. The progress of each alternative will be reported to the planning committee by the specific city department, business, organization or individuals responsible for implementation of the various mitigation actions. The progress report will include any difficulties or successes in meeting the alternative, how coordination efforts are proceeding, and which alternatives should be revised. Also, regular review of the plan will also allow the city to include new goals and objectives that may be identified after the initial adoption.

8.2 EVALUATION CRITERIA TO MEASURE EFFECTIVENESS OF THE PLAN

1. Do goals and objectives address current and expected conditions?
2. Have the nature, magnitude, and/or type of risks changed?
3. Are there implementation problems?
4. Are current resources available appropriate to implement the plan or parts of the plan?
5. Were the outcomes as expected?
6. Did the plan partners participate as originally planned?
7. Has the plan been reviewed and incorporated (entire document or essential parts) into other planning documents for the city.

Procedures and Techniques for Future Reviews and Updates

Step #1. Evaluate the effectiveness of the Planning Process.

1. Reconvene the planning team.
2. Review your planning process and items to discuss:
 - a. Building the planning team
 - b. Engaging the public
 - c. Data gathering and analysis
 - d. Coordinating with other agencies

Step #2. Evaluate the effectiveness of your actions.

1. What were the results of the implementation action? Did the results achieve the goals/objectives outlined in the plan? Did the actions have the intended results?
2. Were actions cost-effective? Did, or would, the project result in reduction of potential losses?
3. Document actions that were slow to start or not implemented.

Step #3. Determine why actions worked or did not work. Possible reasons are, but not limited to:

1. Lack of available resources.
2. The political or popular support for or against the action.
3. The availability of funds.
4. The workloads of the responsible parties.
5. The actual time necessary to implement the actions.

8.3 METHOD AND SCHEDULE FOR UPDATING THE PLAN

Each hazard mitigation planning committee will be reconvened at the will of the City Council or Board of supervisors, no more than once per year (annually) to review and update the plan. Each meeting should be posted prior to the meeting inviting the public to participate and to gain the most citizen input in the plan updates. Additionally, the council will reconvene the hazard mitigation planning committee along with the assistance of the Emmet County Emergency Management Director and outside planning consultants on a five (5) year basis to complete a comprehensive update to the Emmet County Hazard Mitigation Plan and the proposed mitigation actions. The county/city may at its discretion and will be encouraged to participate with an Emmet County multi-jurisdiction hazard mitigation plan at some point in time during the city's five year period of compliance with FEMA. Future updates of the Emmet County Multijurisdictional Hazard Mitigation Plan will be incorporated into and become part of a multijurisdictional plan for all of Emmet County.

8.4. INCORPORATION OF THE EMMET COUNTY MULTIJURISDICTIONAL HAZARD MITIGATION PLAN INTO OTHER JURISDICTIONAL PLANNING DOCUMENTS

Each of the hazard mitigation planning committees will be reconvened at the will of their City Council or Board of supervisors, no more than once per year (annually) to review and update the plan. Additionally, the council or board will reconvene the hazard mitigation planning committee along with the assistance of the Emmet County Emergency Management Director and outside planning consultants on a five (5) year basis to complete a comprehensive update to the Emmet Hazard Mitigation Plan and the proposed mitigation actions. If a city chooses to update plan they must inform the emergency management director to update the master copy.

Section 9. County/City Information

Section 9.1 Emmet County

Planning Committee Members:

Mike Martens - Sheriff
Barb Bohm – Assessor
Terry Reekers – Emergency Management
Roger Patocka - Engineer

County Contact:

Terry Reekers, County Emergency Management 712-362-5702

Planning Process

Meetings were held throughout the planning process to collect information and share that information with the general public and the planning team. Notices for meetings were posted at city hall or the school where the meeting was being held. Agendas and minutes for meetings are included in the Appendix.

Utilities

The utilities that supply the county are represented in each of the city profiles that follow.

Future Plans and Mechanisms

The Emmet County planning committee stated they would try to incorporate the mitigation strategies developed in the plan in their community actions and other community planned documents if they occur. The committee also stated they would draw from other community mechanisms when applicable to add into the mitigation strategies and mitigation requirements of their hazard mitigation plan.

In preparation of this plan, existing plans and other technical information was considered. The purpose of this review was to give consideration to existing information before setting future mitigation goals.

Plan/Document	If yes last year updated	Plan/Document	If yes last year updated
Comprehensive/Landuse plan	Yes 2002	Capital Improvement Plan	No
Economic Development Plan	No	County Recovery Plan	Yes 2010
School Mitigation Plan	Yes	County Mitigation Plan	Yes
Building Code	No	Flood Ordinance or Plan	Yes
Tree Trimming Ordinance	Yes	Zoning Ordinance	Yes 2013
Storm Water Ordinance	No	Subdivision	Yes 2013
Well Protection	No	Nuisance Ordinance	Yes

Emergency Services

Are represented in the following city profiles.

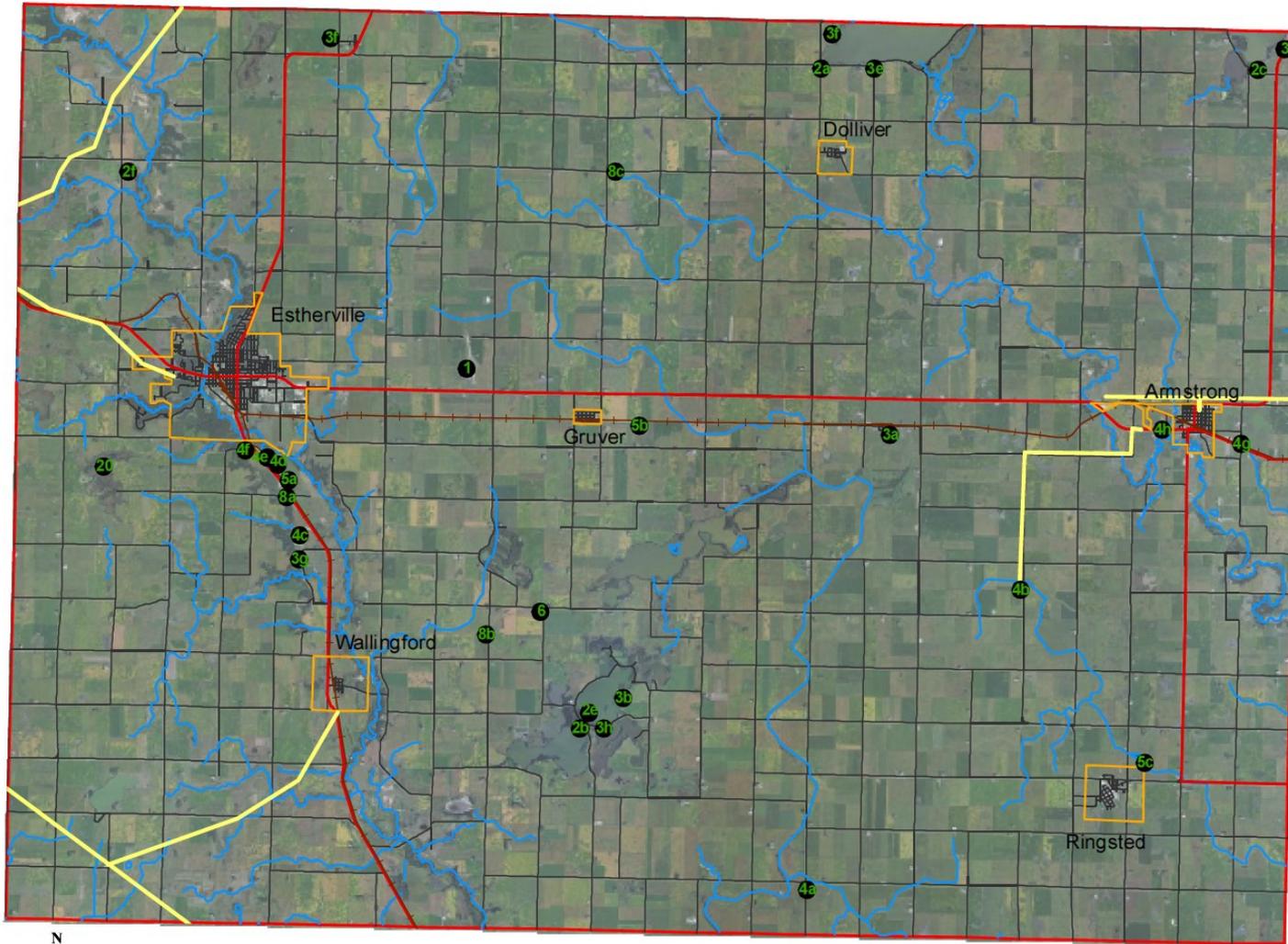
Critical Facilities

Emmet County Critical Facility	Address	Value	Peak Population	
1	Airport	4250 Hwy 9	\$1,121,800	1,000
2a	Turtle Lake Campground	110th St	\$167,400	600
2b	Wolden Park Campground	450th Ave	\$454,900	600
2c	Iowa Lake Campground	110th St	\$43,000	150
2d	Fort Defiance State Park & Campground	3661 174th St	\$1,500,000	200
2e	Ingham lake Bible Camp	2258 450th Ave	\$122,000	200
2f	Ringham Habitat	360th Ave	\$33,300	100
3a	Maple Hill	1746 500th Ave	\$264,600	100
3b	Ingham Lake Estates	455th Ave + 230 St	\$351,000	500
3c	Huntington	Refer to map		100
3d	102nd St/Iowa Lake	102 St	\$43,900	25
3e	Tuttle Lake South	110th St	\$50,000	150
3f	Tuttle Lake Northwest	110th St	\$50,000	100
3g	Forest Ridge	4510 230th	\$139,700	150
3h	Forest Ridge (Ingham	4502 230th St	\$404,900	100
4a	Hoprig/Fertilizer Storage	2607 490th Ave	\$424,000	20
4b	Feed Mill	5265 530th Ave	\$2,000,000	20
4c	Day Break Foods	1959 Hwy 4	\$14,000,000	100
4d	Rendering Plant	1842 Hwy 4	\$452,300	150
4e	New Fashion Pork	1816 Hwy 4	\$2,936,500	100
4f	C&G manufacturing	1809 Hwy 4	\$138,500	6
4g	State Line Fertilizer Plant	5670 Hwy 9	\$1,760,500	10
4h	Artswag Manufacturing	5556 Hwy 9	\$1,296,700	250
5a	Waste Water Treatment Estherville	1878 Hwy 4	\$5,005,500	20
5b	Waste Water Lagoon Gruver	Sec 13 Center Twp, 1700 Block 450th Ave	\$34,000	4
5c	Waste Water Lagoon Ringsted	2356 550th Ave	\$28,700	4
6	Church Immanuel Lutheran	2105 440th Ave	\$90,000	100
7	Natural Gas Pipe Line	5909427003	\$30,400	6
8a	Electrical Substation	3923 190th St	\$10,000	6
8b	Electrical Substation	1302 450th Ave	\$10,000	6
8c	Electrical Substation	2270 7th Ave S	\$10,000	6

Land Use and Development

There have not been any significant changes in land use or development (i.e. residential, commercial, or industrial) within the rural unincorporated county since the previous County Hazard Mitigation Plan. There have not been any changes in land use patterns or development in hazard prone areas (i.e. flash flood, river flood, levees, landslide, grass & wildland fire). The lack of development is evident by the fact Emmet County's population is decreasing and the local economy is not changing or growing. The County's population as depicted in the U.S. Census of Emmet County for years 2000 and 2010 resulted in the County's population declining 725 persons or -6.57% from 11,027 to 10,302 persons. The rural unincorporated population has declined over this same period by 326 persons, or -12.72% from 2,563 to 2,237 persons. Currently there is no evidence of any significant development to take place or changes in development and land use patterns for the foreseeable future.

Emmet County Critical Facilities



Hazard Risk Assessment

The Emmet County Hazard Mitigation Planning Committee determined the countywide hazard rankings. They eliminated the hazards that were in the countywide ranking, such as: earthquake, sinkholes and expansive soils. The planning team decided that those hazards did not apply to the county.

It is recognized that county may be susceptible to other hazards, such as the other hazards in the State of Iowa Hazard Mitigation Plan, but those hazards are not considered to be a high risk and are not examined at this time. However, if it is later determined that a hazard affecting the county does pose a higher risk than originally determined, it will be examined at that time or when the plan is updated.

4.2 – Hazard Ranking	
1	Severe Winter Storm
2	Windstorm
3	Grass and Wildland Fire
4	River Flood
5	Hailstorm
6	Extreme Heat
7	Thunderstorm and Lightning
8	Flash Flood
9	Tornado
10	Drought
11	Levee Failure
12	Landslide
13	Dam Failure

Source: Emmet County Planning Committee

**This hazard scoring, which was completed by the Emmet County Hazard Mitigation Planning Team, was used for all jurisdictions in Emmet County. The hazard ranking comprised from the scoring was given to each jurisdiction and the jurisdictions identified which hazards could impact them and re-ranked the hazards according to their historical knowledge of their community.*

Identified Mitigation Actions

The following are the actions that were identified by the local planning committee:

- Enforce Tree Trimming
- Back up Power Generators (buy)
- Bury Utility Lines
- NOAA Weather Radios (buy /distribute)
- Designating Community Shelter
- Outdoor Warning Sirens (build or update)
- Watershed study & Implement
- Building/Zoning Codes
- Continue HAZMAT Training (Mason City)
- Continue Fire Dept Training
- Snow Removal Policy
- List of Storm Shelters
- Public Education/Awareness
- Maintain Outdoor Warning Sirens
- Update/Create Local Emergency Plan
- Replace Sewer Lines
- Purchase Portable Pumps
- Fire Gear PPE
- Shelter rations (cots, blankets, water, etc)
- Backup of City/County Records
- Create Dry Hydrants
- Enforce Burn Bans

- Affirm Rural Water Connection
- Sandbags
- Determine which areas are most prone to flood
- Remain Compliant with NFIP
- Better Connection w/DNR
- Reaffirm Mutual AID
- Enforce Floodplain ordinance
- Test warning sirens monthly
- Update Transmission Structures
- Maintain & expand debris removal site
- Monitor Levees and dams
- Stream gauge monitoring system
- Energy Conservation program
- Improve water quality/quantity
- Land stewardship
- Sustainable food production

The Emmet County Planning Team and Emmet County are responsible for overseeing the implementation of this plan. Emmet County Emergency Management and other county and local agencies will assist with implementing and administering this plan. The mitigations actions were discussed with a high, medium and low priority ranking in mind. **High (H)** – Jurisdictions valued this as something that had the highest effect on helping the community and people survive severe weather events. Also the cost could be easily obtained or funding has already been set aside. **Medium (M)** – These were valued at the jurisdictions as projects that were ranked in between the other two priority groups. **Low (L)** – These mitigation actions have the least effect on protecting human life from severe weather events and therefore have been given the lowest priority. Or the cost is too high at this point in time and makes it unlikely to be acted upon in present future. Priorities for each mitigation action are discussed in the Mitigation Actions, Section 6. Another factor in the implementation of the mitigation actions was their benefit versus how much the project would cost. Economics of implementing mitigation actions were considered when the planning team discussed the priority of projects. Cost estimates were given by the Emmet County Planning Committee to help display which actions were of a higher importance and fit in the economic goals of the county/cities/schools. Those estimates can be reference in Section 6. The Implementation Schedule for the mitigation activities, whether ongoing or considered, will be subject to the availability of Federal, State, and local funding. Continuing (ON) = Ongoing (responsible entity regularly participates in or supports); Short Term (ST) = 1-5 years to initiate or accomplish; and Long Term (LT) = 5 or more years to initiate or accomplish.

Once the plan is completed, approved, and adopted, local governments will be eligible for funding assistance from FEMA for mitigation strategies put forth in the plan. Potential funding resources include the FEMA Pre-Disaster Mitigation Program (PDM) and FEMA Hazard Mitigation Grant Program (HMGP). No timeframe was identified in implementing these mitigation actions will be acted upon as funding become available. It was discussed that additional mitigation actions would be examined during the update process. The mitigation actions that were discussed were what the Emmet Planning Committee wanted to have included in the hazard mitigation plan.

Plan Maintenance

Plan maintenance involves taking action to ensure that the plan stays current with information, priorities are still in order, and goals and objectives are maintained and updated. To accomplish this, the plan will be reviewed by the planning team annually and be incorporated into other city plans. Additionally, a comprehensive update is required at least once every 5 years and submitted to FEMA for certification. The revised plan will be adopted by the city council. To assist with the update, information is to be collected by the county annually to document efforts, hazard events, and other pertinent activities to mitigate hazards. Part

Section 9.2 Armstrong

Planning Committee Members:

Marvin Dailey	Mayor
Connie Thackery	City Clerk
Delaine Hiney	Citizen
Kathy Preston	Citizen

City Contact:

Connie Thackery City Clerk – 712-473-2455

Planning Process

Meetings were held throughout the planning process to collect information and share that information with the general public and the planning team. Notices for meetings were posted at city hall or the school where the meeting was being held. Agendas and minutes for meetings are included in the Appendix.

Utilities

Water

Name:	City of Armstrong		
Location:	1 S side City Park, 1 N water tower		
Well Avg Depth (ft):	104' & 106'	Peak Demand (mgd):	250,000
Treated:	Yes, Media filter, polyphosphate, chlorine, soften	Cost/1000 Gal:	\$12 for first 1,000, 2.75 to 5,000, 2.00 for 6,000+
Rated Capacity (mgd):	300	Storage Capacity (gal):	190,000
Temp Range (F):	55	Major Source:	Pleistocene Aquifer
Avg Capacity (mgd):	186000	Hardness (ppm):	479
Connection Fee:	50		
Phone:		Web Address:	

Sewer

Name:	City of Armstrong		
Location:	S town on Hwy 15		
Ownership Type:	Municipal	Average Daily Demand (mgd):	Unknown
Rated Capacity (mgd):	575,000	Peak Demand (mgd):	Unknown
Cost/1000 Gal:	75% of water + 4.75 a month	Connection Fee:	Unknown
Phone:		Web Address:	

Electric and Natural Gas

Name:	Alliant		
Phone:	800-255-4268	Web Address:	http://www.alliantenergy.com/

Telecommunications

Name: Ringtel
Location: Armstrong **Website:** www.ringtelco.com
Phone: 712-868-8000 **Services:** Phone, Cable, Internet

Infrastructure

Solid Waste and Recycling Waste Management
 Curb and Gutter Yes – 60% of City
 Waste Water Treatment Yes Constructed 1986
 How Many Cell Lagoon 3 Cell
 Floodplain Ordinance n/a
 Floodplain Compliance Officer Terry Reekers (For assistance in the administration of the floodplain regulations, contact the Iowa Department of Natural Resources)

Future Plans and Mechanisms

The City of Armstrong planning committee stated they would try to incorporate the mitigation strategies developed in the plan in their community actions and other community planned documents if they occur. The committee also stated they would draw from other community mechanisms when applicable to add into the mitigation strategies and mitigation requirements of their hazard mitigation plan.

In preparation of this plan, existing plans and other technical information was considered. The purpose of this review was to give consideration to existing information before setting future mitigation goals.

Plan/Document	If yes last year updated	Plan/Document	If yes last year updated
Comprehensive/Landuse plan	Yes 2003	Capital Improvement Plan	Yes 2007
Local Emergency Plan	No	Local Recovery Plan	No
Local Mitigation Plan	No	County Mitigation Plan	Yes
Economic Development Plan	No	Flood Ordinance or Plan	n/a
School Mitigation Plan	No	Zoning Ordinance	Yes 2002
Building Code	State IA	Subdivision	Yes 2002
Tree Trimming Ordinance	Yes 2010	Nuisance Ordinance	Yes 2010
Storm Water Ordinance	No		

Emergency Services

Fire Rescue Dept 22 Volt fire fighter trained at HazMat Awareness/Ops
 19 Volt Firefighters trained at FF1
 1 Volt Firefighters trained at FF2
 19 Volt Firefighters trained at incident command level
 19 Volt Emergency Rescue Technician (ERT)
 8 Volt Emergency Medical Technician (EMTB)
 0 Paramedics
 0 EMTI
 1 Nurse
 Fire equipment at station 3 pumpers, water truck, 1 ambulance, attack truck
 Law Enforcement One officer, one car. Contract also with County.

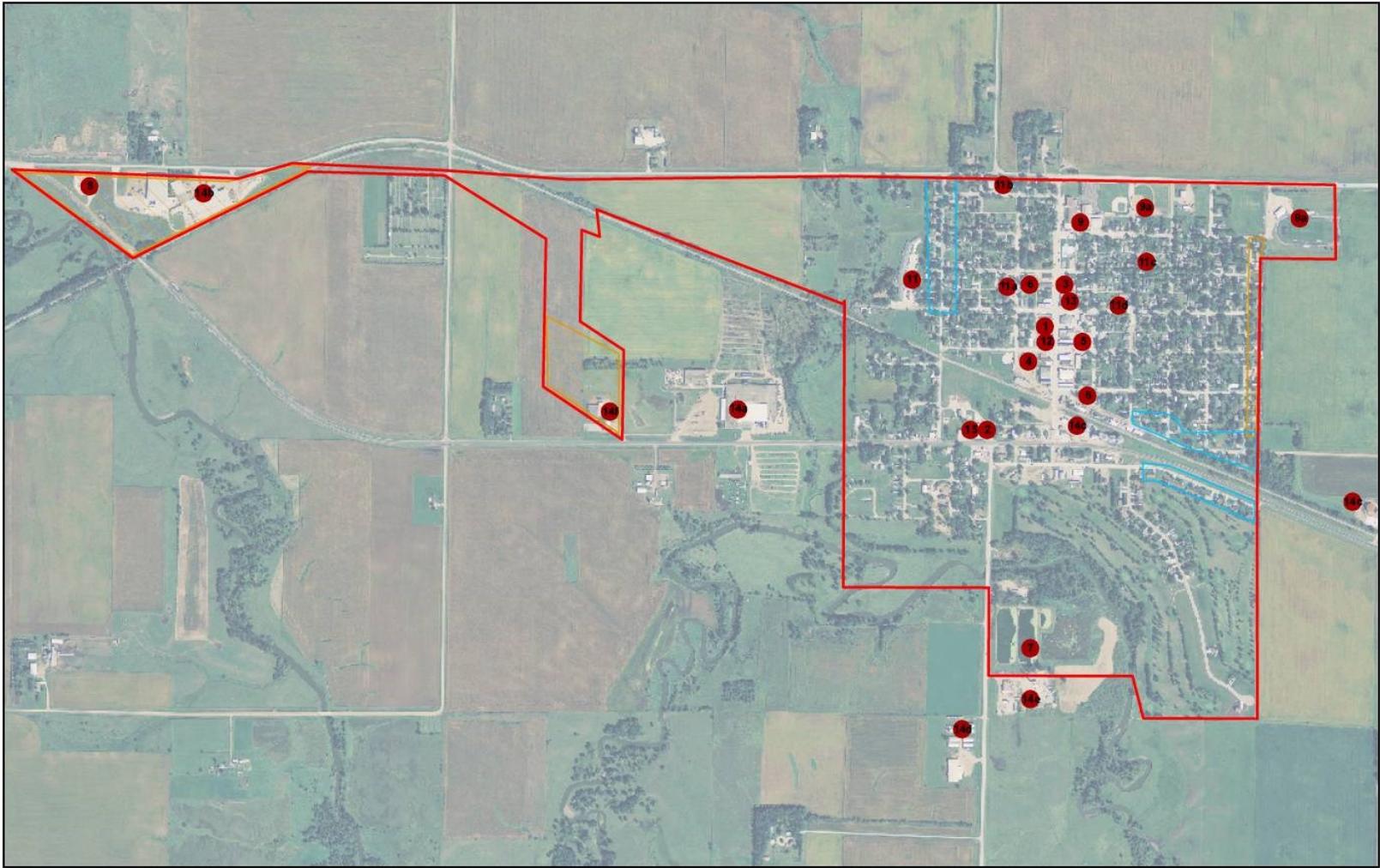
Emergency Warning System	Yes, 1 siren @ city shed
Flood fighting plan	No
Sandbagging plan	No
Evacuation/rescue plan	No

Critical Facilities and Assessed Values

Armstrong Critical Facility	Address	Value	Peak Population
1 City Offices	507 6th Street	\$77,500	10
2 Fire Dept./Outdoor warning siren	310 4th Ave S	\$79,600	50
3 Medical Clinic	412 6th St	\$95,200	12
4 City Maintenance/Warning siren	503 1st Ave	\$22,500	4
5 Post Office	601 1st Ave	\$66,400	10
6 Public Works/Water Plant	503 3rd Ave	\$10,500	4
7 Wastewater treatment plant	Refer to map	\$100,000	4
8 Electrical Substation	5432 Hwy 9	\$10,000	3
9 Public School - North Union	600 4th Ave	\$3,419,100	175
10 Retirement Home/Assisted Living	108 2nd Ave	\$1,230,700	80
11a Lutheran Church	401 5th St	\$555,700	200
11b Catholic Church	404 5th Ave	\$413,300	150
11c Presbyterian Church	800 3rd Ave	\$54,800	40
11c Methodist Church	708 2nd Ave	\$202,600	100
12 Daycare Center	525 6th St	\$28,900	25
13 Library	308 6th St	\$244,700	6
14a Arts Way Manufacturing	5556 HWY 9	\$1,296,700	120
14b GKN	5453 6th Ave	\$1,950,000	170
14c State Line COOP/Fertilizer Plant	706 6th St		20
14d TG Industries	1821 HWY 15	\$321,800	30
14e Galco	1810 B HWY 15s	\$44,000	12
14f Pallets (with Above)	5530 HWY 9	\$113,200	With above
9a North Union Athletic Field	1743 HWY 15	\$91,800	500
15 Iowa Electric Light and Power	Refer to map	\$102,300	5

Land Use and Development

There have not been any significant changes in land use or development (i.e. residential, commercial, or industrial) within the City of Armstrong since the previous City Hazard Mitigation Plan. There are no new businesses or industries (construction of new structures for businesses or industries) since the last City Hazard Mitigation Plan were adopted. There have not been any changes in land use patterns or development in hazard prone areas (i.e. flash flood, river flood, grass & wildland fire). The lack of development is evident by the fact the City's population is decreasing and the local economy is not changing or growing. The City's population as depicted in the U.S. Census for years 2000 and 2010 resulted in the City's population declining 53 persons or -5.41% from 979 to 926 persons. Currently there is no evidence of any significant future development to take place or changes in development and land use patterns for the foreseeable future; especially in hazard prone areas. The City's population is expected to decline more from year 2010 to 2020.



Hazard Risk Assessment

The Emmet County Hazard Mitigation Planning Committee determined the countywide hazard rankings. The city was also provided with information and statistics relevant to hazards affecting Armstrong, including records of past events and damages. The city was asked to review the information from the countywide rankings and determine if highest risk hazards for the county applied to Armstrong, and if not, how Armstrong’s situation differs from the county. Based on this discussion, prevalent hazards were determined for Armstrong. Along with the information and statistics provided, the people present were asked to draw upon their knowledge and experiences of hazards affecting Armstrong. After the discussion among the planning team, it was decided that the City of Armstrong would re-prioritize the hazards of the countywide ranking for their jurisdictional portion of the plan. The city eliminated the hazard of landslide. The planning team decided that those hazards did not apply to Armstrong.

It is recognized that Armstrong may be susceptible to other hazards, such as the other hazards in the State of Iowa Hazard Mitigation Plan, but those hazards are not considered to be a high risk and are not examined at this time. However, if it is later determined that a hazard affecting Armstrong does pose a higher risk than originally determined, it will be examined at that time or when the plan is updated.

4.2 – Hazard Ranking	
1	Severe Winter Storm
2	Windstorm
3	Grass and Wildland Fire
4	River Flood
5	Hailstorm
6	Extreme Heat
7	Thunderstorm and Lightning
8	Flash Flood
9	Tornado
10	Drought
11	Dam Failure

Source: Emmet County Planning Committee

**This hazard scoring, which was completed by the Emmet County Hazard Mitigation Planning Team, was used for all jurisdictions in Emmet County. The hazard ranking comprised from the scoring was given to each jurisdiction and the jurisdictions identified which hazards could impact them and re-ranked the hazards according to their historical knowledge of their community.*

Identified Mitigation Actions

The following are the actions that were identified by the local planning committee:

- Enforce Tree Trimming
- Back up Power Generators (buy)
- Bury Utility Lines
- NOAA Weather Radios (buy /distribute)
- Designating Community Shelter
- Purchase Snow Plow/Truck
- Good Neighbor Program
- Monitor Levees and dams
- Tornado Safe Room (build) – Backside of fire hall
- Look into NFIP Participation
- Outdoor Warning Sirens (build or update)
- Building/Zoning Codes
- Continue HAZMAT Training (Mason City)
- Continue Fire Dept Training
- Snow Removal Policy
- Public Education/Awareness
- Maintain Outdoor Warning Sirens

- Update/Create Local Emergency Plan
- Clean/Enlarge Sewage Lagoons
- Construct Sewer Lift Station
- Replace Sewer Lines
- Purchase Portable Pumps
- Fire Gear PPE
- List of those of elderly, disabled or medically distressed
- Shelter rations (cots, blankets, water, etc)
- Backup of City/County Records
- Create Dry Hydrants
- Enforce Burn Bans
- Sandbags
- Better Connection w/DNR
- Reaffirm Mutual AID
- Paramedic equipment
- Maintain sand bagging plan
- Test warning sirens monthly
- Maintain & expand debris removal site
- Review/update Local operations Plan
- Improve water quality/quantity

The Armstrong Planning Team and Emmet County are responsible for overseeing the implementation of this plan. Emmet County Emergency Management and other county and local agencies will assist with implementing and administering this plan. The mitigations actions were discussed with a high, medium and low priority ranking in mind. **High (H)** – Jurisdictions valued this as something that had the highest effect on helping the community and people survive severe weather events. Also the cost could be easily obtained or funding has already been set aside. **Medium (M)** – These were valued at the jurisdictions as projects that were ranked in between the other two priority groups. **Low (L)** – These mitigation actions have the least effect on protecting human life from severe weather events and therefore have been given the lowest priority. Or the cost is too high at this point in time and makes it unlikely to be acted upon in present future. Priorities for each mitigation action are discussed in the Mitigation Actions, Section 6. Another factor in the implementation of the mitigation actions was their benefit versus how much the project would cost. Economics of implementing mitigation actions were considered when the planning team discussed the priority of projects. Cost estimates were given by the Emmet County Planning Committee to help display which actions were of a higher importance and fit in the economic goals of the county/cities/schools. Those estimates can be reference in Section 6. The Implementation Schedule for the mitigation activities, whether ongoing or considered, will be subject to the availability of Federal, State, and local funding. Continuing (ON) = Ongoing (responsible entity regularly participates in or supports); Short Term (ST) = 1-5 years to initiate or accomplish; and Long Term (LT) = 5 or more years to initiate or accomplish.

Once the plan is completed, approved, and adopted, local governments will be eligible for funding assistance from FEMA for mitigation strategies put forth in the plan. Potential funding resources include the FEMA Pre-Disaster Mitigation Program (PDM) and FEMA Hazard Mitigation Grant Program (HMGP). No timeframe was identified in implementing these mitigation actions will be acted upon as funding become available. It was discussed that additional mitigation actions would be examined during the update process. The mitigation actions that were discussed were what the Armstrong Planning Committee wanted to have included in the hazard mitigation plan.

Plan Maintenance

Plan maintenance involves taking action to ensure that the plan stays current with information, priorities are still in order, and goals and objectives are maintained and updated. To accomplish this, the plan will be

Section 9.3 Dolliver

Planning Committee Members:

Russell Deling Mayor
Sandra Holl City Clerk

City Contact:

Sandra Holl – City Clerk 712-865-2202

Planning Process

Meetings were held throughout the planning process to collect information and share that information with the general public and the planning team. Notices for meetings were posted at city hall or the school where the meeting was being held. Agendas and minutes for meetings are included in the Appendix.

Utilities

Water

Name: City has wells

Sewer

Name: Iowa Lakes Regional Water
Phone: 712-262-8847 Web Address: www.ilrw.org

Electric

Name: Alliant
Phone: 1-800-255-4268 Web Address: www.alliantenergy.com

Natural Gas

Name: None. Personal LP tanks

Telecommunications

Name: Windstream
Phone: 1-866-445-5880 Web Address: www.windstream.com

Infrastructure

Solid Waste and Recycling	Harris Sanitation
Curb and Gutter	None
Waste Water Treatment	No
How Many Cell Lagoon	No
Floodplain Ordinance	No
Floodplain Compliance Officer	Terry Reekers (For assistance in the administration of the floodplain regulations, contact the Iowa Department of Natural Resources)

Future Plans and Mechanisms

The City of Dolliver planning committee stated they would try to incorporate the mitigation strategies developed in the plan in their community actions and other community planned documents if they occur.

The committee also stated they would draw from other community mechanisms when applicable to add into the mitigation strategies and mitigation requirements of their hazard mitigation plan.

In preparation of this plan, existing plans and other technical information was considered. The purpose of this review was to give consideration to existing information before setting future mitigation goals.

Plan/Document	If yes last year updated	Plan/Document	If yes last year updated
Comprehensive/Landuse plan	No	Capital Improvement Plan	No
Local Emergency Plan	Yes	Local Recovery Plan	Yes
Local Mitigation Plan	No 2004	County Mitigation Plan	Yes
Economic Development Plan	No	Flood Ordinance or Plan	No
School Mitigation Plan	No	Zoning Ordinance	No
Building Code	Yes	Subdivision	No
Tree Trimming Ordinance	No	Nuisance Ordinance	Yes
Storm Water Ordinance	No		

Emergency Services

Fire Rescue Dept	Gruver Fire Department covers Dolliver and houses a tanker and a pumper in town
Law Enforcement	28-E with Emmet County Sherriff
Emergency Warning System	No
Flood fighting plan	No
Sandbagging plan	No
Evacuation/rescue plan	No

Land Use and Development

There have not been any significant changes in land use or development (i.e. residential, commercial, or industrial) within the City of Dolliver since the previous City Hazard Mitigation Plan. There are no new businesses, industries, or residential development (construction of new structures for businesses, industries, or residential) since the last City Hazard Mitigation Plan were adopted. There have not been any changes in land use patterns or development in hazard prone areas (i.e. flash flood, river flood, grass & wildland fire). The lack of development is evident by the fact the City's population is decreasing and the local economy is not changing or growing. The City's population as depicted in the U.S. Census for years 2000 and 2010 resulted in the City's population declining 14 persons or -14.29% from 77 to 66 persons. Currently there is no evidence of any significant future development to take place or changes in development and land use patterns for the foreseeable future; especially in hazard prone areas. The community has limited resources for future development.

Critical Facilities and Assessed Values

Dolliver Critical Facility	Address	Value	Peak Population
1 Community Center, Well, City Offices, Water Plant	5017 Shafter Street	\$23,600	60
2 Methodist Church	4095 Otis Street	\$64,100	200
3 Post Office	5088 Main Street	\$23,000	15
4 Waste Water Treatment Plant	2020 Main Street	\$200,000	2
5 Telephone	5064 Main Street	\$50,000	1
6 Fire Truck Storage	4097 Main Street	\$50,000	40



Hazard Risk Assessment

The Emmet County Hazard Mitigation Planning Committee determined the countywide hazard rankings. The city was also provided with information and statistics relevant to hazards affecting Dolliver, including records of past events and damages. The city was asked to review the information from the countywide rankings and determine if highest risk hazards for the county applied to Dolliver, and if not, how Dolliver's situation differs from the county. Based on this discussion, prevalent hazards were determined for Dolliver. Along with the information and statistics provided, the people present were asked to draw upon their knowledge and experiences of hazards affecting Dolliver. After the discussion among the planning team, it was decided that the City of Dolliver would re-prioritize the hazards of the countywide ranking for their jurisdictional portion of the plan. The city eliminated many of the hazards that were in the countywide ranking, such as: landslide, river flood, levee failure and dam failure, sinkhole. The planning team decided that those hazards did not apply to Dolliver.

It is recognized that Dolliver may be susceptible to other hazards, such as the other hazards in the State of Iowa Hazard Mitigation Plan, but those hazards are not considered to be a high risk and are not examined at this time. However, if it is later determined that a hazard affecting Dolliver does pose a higher risk than originally determined, it will be examined at that time or when the plan is Dolliver.

4.2 – Hazard Ranking	
1	Severe Winter Storm
2	Windstorm
3	Grass and Wildland Fire
4	Hailstorm
5	Extreme Heat
6	Thunderstorm and Lightning
7	Flash Flood
8	Tornado
9	Drought
Source: Emmet County Planning Committee	

**This hazard scoring, which was completed by the Emmet County Hazard Mitigation Planning Team, was used for all jurisdictions in Emmet County. The hazard ranking comprised from the scoring was given to each jurisdiction and the jurisdictions identified which hazards could impact them and re-ranked the hazards according to their historical knowledge of their community.*

Iowa Identified Mitigation Actions

The following are the actions that were identified by the local planning committee:

- Enforce Tree Trimming
- Buy and Distribute NOAA Weather Radios
- Establishing a Good Neighbor Program to Check on Residents
- Designating Community Shelter
- Enforce the Snow Removal Policy
- Look into NFIP Participation
- Warning Siren
- Public awareness and information

The Dolliver Planning Team and Emmet County are responsible for overseeing the implementation of this plan. Emmet County Emergency Management and other county and local agencies will assist with implementing and administering this plan. The mitigations actions were discussed with a high, medium and low priority ranking in mind. **High (H)** – Jurisdictions valued this as something that had the highest effect on helping the community and people survive severe weather events. Also the cost could be easily obtained or funding has already been set aside. **Medium (M)** – These were valued at the jurisdictions as projects that where ranked in between the other two priority groups. **Low (L)** – These mitigation actions have the least

effect on protecting human life from severe weather events and therefore have been given the lowest priority. Or the cost is too high at this point in time and makes it unlikely to be acted upon in present future. Priorities for each mitigation action are discussed in the Mitigation Actions, Section 6. Another factor in the implementation of the mitigation actions was their benefit versus how much the project would cost. Economics of implementing mitigation actions were considered when the planning team discussed the priority of projects. Cost estimates were given by the Emmet County Planning Committee to help display which actions were of a higher importance and fit in the economic goals of the county/cities/schools. Those estimates can be reference in Section 6. The Implementation Schedule for the mitigation activities, whether ongoing or considered, will be subject to the availability of Federal, State, and local funding. Continuing (ON) = Ongoing (responsible entity regularly participates in or supports); Short Term (ST) = 1-5 years to initiate or accomplish; and Long Term (LT) = 5 or more years to initiate or accomplish.

Once the plan is completed, approved, and adopted, local governments will be eligible for funding assistance from FEMA for mitigation strategies put forth in the plan. Potential funding resources include the FEMA Pre-Disaster Mitigation Program (PDM) and FEMA Hazard Mitigation Grant Program (HMGP). No timeframe was identified in implementing these mitigation actions will be acted upon as funding become available. It was discussed that additional mitigation actions would be examined during the update process. The mitigation actions that were discussed were what the Dolliver Planning Committee wanted to have included in the hazard mitigation plan.

Plan Maintenance

Plan maintenance involves taking action to ensure that the plan stays current with information, priorities are still in order, and goals and objectives are maintained and updated. To accomplish this, the plan will be reviewed by the planning team annually and be incorporated into other city plans. Additionally, a comprehensive update is required at least once every 5 years and submitted to FEMA for certification. The revised plan will be adopted by the city council. To assist with the update, information is to be collected by the city annually to document efforts, hazard events, and other pertinent activities to mitigate hazards. Part of plan maintenance is maintaining the planning team. The planning team is composed of local elected officials, city employees and other interested parties. This is an important part of plan maintenance in order to reconvene the planning team when necessary.

Monitoring

The Dolliver Planning Team and Emmet County Emergency Management are responsible for monitoring this portion of the plan. The plan will be monitored based on the mitigation strategies identified in the plan and the reported progress to accomplish the work. Projects that are complete will be monitored for effectiveness. Any strategies that are removed from the plan will be examined and documented. An annual reporting sheet is included in this plan for the city to keep track of the mitigation process.

Incorporation into Existing Plans

The city is responsible for reviewing its local plans, codes, and ordinances and amending documents as they see appropriate. As appropriate, information and actions from this plan will be incorporated into comprehensive or community builder plans during review and update processes. A worksheet is provided to record what information from this plan is incorporated to other plans.

Continued Public Participation

The public will be involved in the implementation of the plan at city council meetings and general public meetings. Mitigation actions and implementation strategies will be discussed at city council meetings and an opportunity for public input will be encouraged. This process will ensure opportunity for public awareness of

Section 9.4 Estherville

Planning Committee Members:

Kenny Billings	Mayor
Geoff Schmaus	Street Superintendent
Greg Langford	Fire Department
Eric Milburn	Chief of Police
Elizabeth Burton	City Clerk
Richard Beaver	Fire Chief
Bruce Bruns	Water Superintendent
Paul Budach	Police Sergeant

City Contact:

Elizabeth Burton – City Clerk 712-362-7771

City Staff Council:

Penny A. Clayton	City Administrator
Elizabeth Burton	City Clerk/Finance Director
Barb Mack	Community Development Director

Geoff Schmaus	Street Superintendent
Mitch Eveleth	Electric Superintendent
Bruce Bruns	Water Superintendent
Jeff Kautz	Wastewater Superintendent

Kenny Billings	Mayor
Larry W. Anderson	Council Member
Gene Haukoos	Council Member
Dave Seylar	Council Member
Ann Goebel	Council Member
Terry Nelson	Council Member
Mike Nieland	Council Member
Roger Guge	Council Member

Planning Process

Meetings were held throughout the planning process to collect information and share that information with the general public and the planning team. Notices for meetings were posted at city hall or the school where the meeting was being held. Agendas and minutes for meetings are included in the Appendix.

Utilities

Water

Name:	Estherville Water Plant		
Location:	201 - 1 st Avenue North		
Well Avg Depth (ft):	750 feet	Peak Demand (mgd):	1.5
Treated:	Yes	Cost/1000 Gal:	\$4.34
Rated Capacity (mgd):	2.1	Storage Capacity (gal):	1.5 million
Temp Range (F):	57°	Major Source:	Jordan Aquifer

Future Plans and Mechanisms

The City of Estherville planning committee stated they would try to incorporate the mitigation strategies developed in the plan in their community actions and other community planned documents if they occur. The committee also stated they would draw from other community mechanisms when applicable to add into the mitigation strategies and mitigation requirements of their hazard mitigation plan.

In preparation of this plan, existing plans and other technical information was considered. The purpose of this review was to give consideration to existing information before setting future mitigation goals.

Plan/Document	If yes last year updated	Plan/Document	If yes last year updated
Comprehensive/Landuse plan	Yes 2002	Capital Improvement Plan	No
Local Emergency Plan	Yes 2003	Local Recovery Plan	No
Local Mitigation Plan	Yes 2004	County Mitigation Plan	No
Economic Development Plan	No	Flood Ordinance or Plan	Yes 2000
School Mitigation Plan	No	Zoning Ordinance	Yes 2000
Building Code	No	Subdivision	Yes 2000
Tree Trimming Ordinance	Yes 2000	Nuisance Ordinance	Yes 2000
Storm Water Ordinance	No		

Emergency Services

Fire Rescue Dept	24 Volt fire fighter trained at HazMat Awareness/Ops 24 Volt Firefighters trained at FF1 22 Volt Firefighters trained at FF2 24 Volt Firefighters trained at incident command level 0 Volt Emergency Rescue Technician (ERT) 2 Volt Emergency Medical Technician (EMTB) 0 Paramedics 0 EMTI 0 Nurse
Fire equipment at station	2 pumpers @ 1000 gallons, 1 pumper @ 1250, a 2000 tender, Rescue Unit, 2 Grass Rigs, Rescue Boat
Ambulance Department	20 Volt Emergency Medical Technician (EMTB) 4 Paramedics 1 Nurse 1 EMTI 3 Ambulances at the Dept
Law Enforcement	Estherville Police 14 Officers 2 Part time 3 Trained EMT 3 P.I.O. 8 HazMat Ops
Law Enforcement Equipment	4 Marked Squads 2 Unmarked Squads

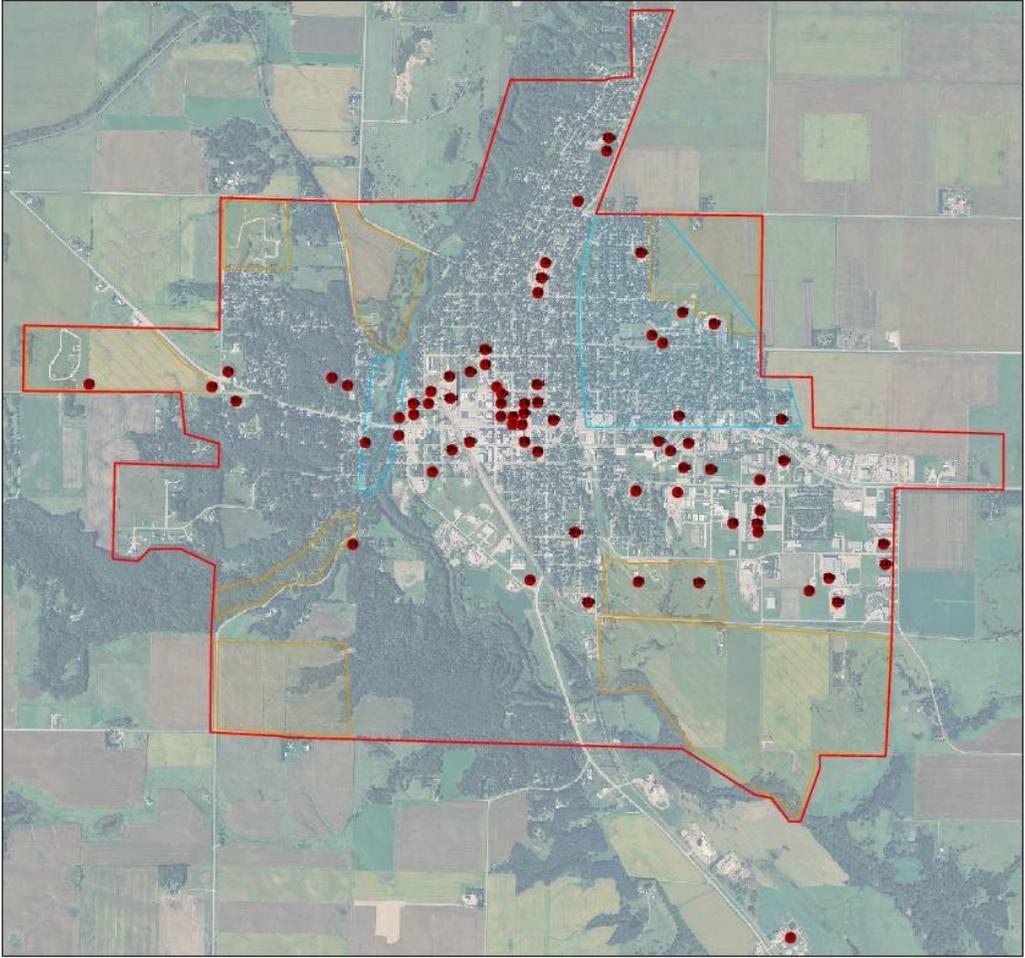
H.E.A.T. Operation	1 Denali SUV 18 operators 1 Tactical Dispatcher 2 EMT 2 Snipers
H.E.A.T. Equipment	4 Crisis Negotiators 1 Communication Truck 1 Troop Transport (20+ passenger)/Tactical Equipment 1 Peace Keeper 1 Seven person van with communications and equipment
Emergency Warning System	6
Flood fighting plan	Yes County
Sandbagging plan	Yes County
Evacuation/rescue plan	Yes County

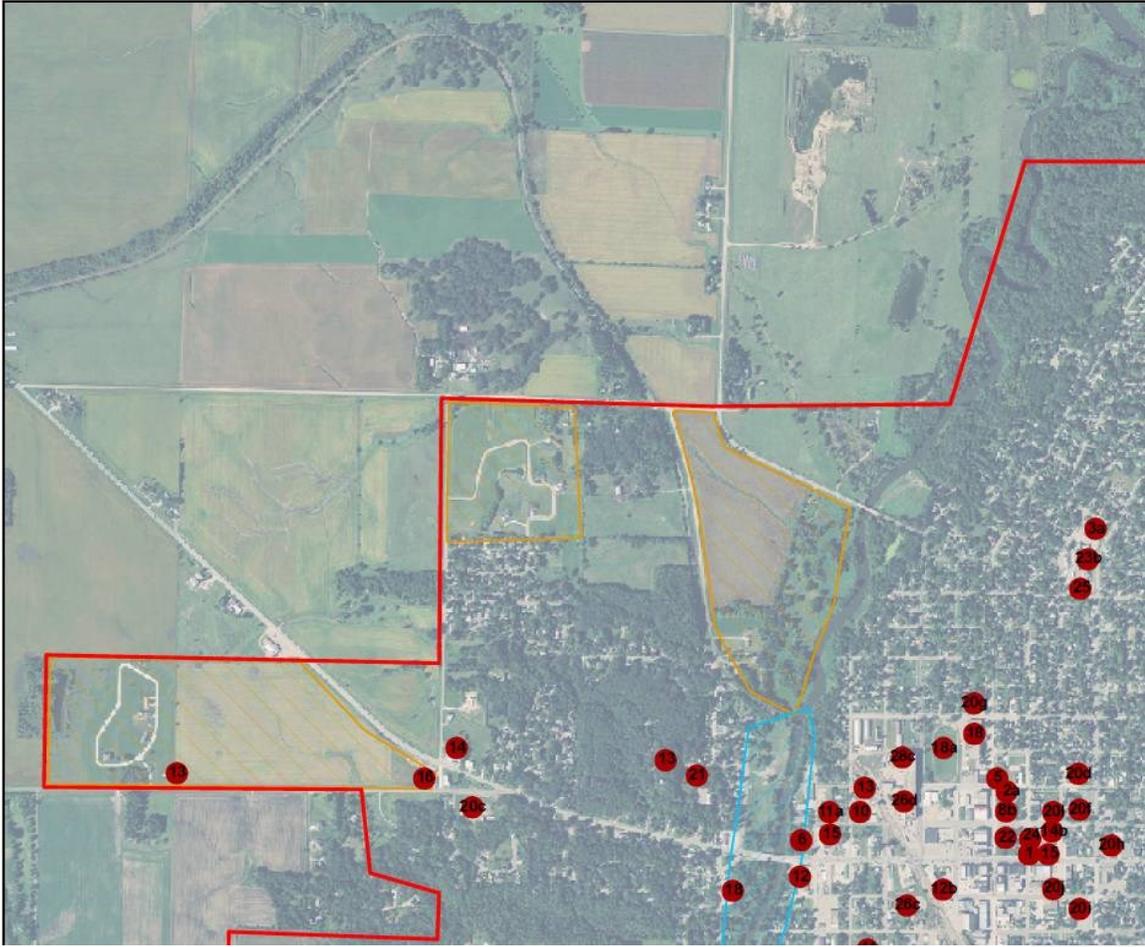
Critical Facilities and Assessed Values

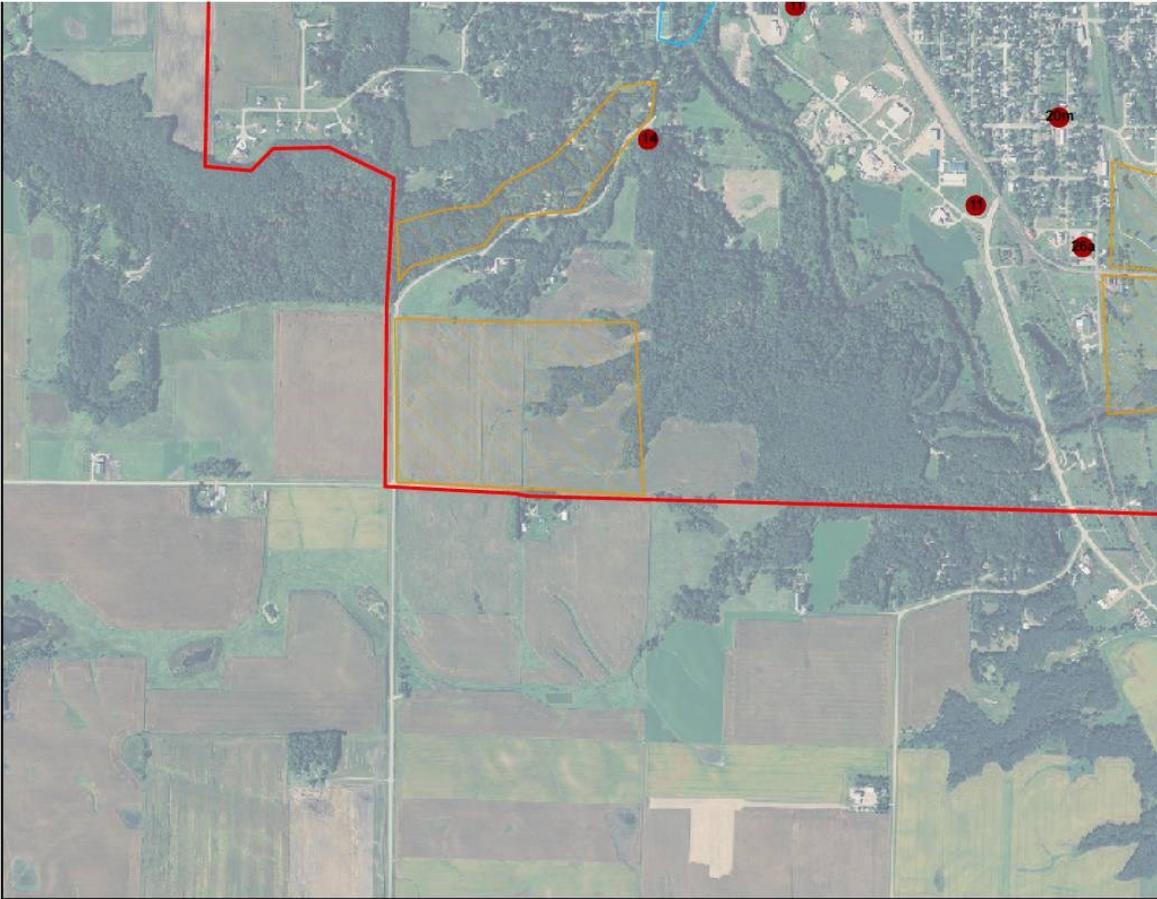
Estherville Critical Facility	Address	Value	Peak Population
1 City Offices	2 North 7th Street	\$809,900	20
2a Police / Courthouse	114 North 6th Street	\$751,700	30
2b Fire Dept	27 South 5th Street	\$143,600	26
3a Medical Clinic	926 North 8th Street	With Hosp	50
3b Hospital	826 North 8th Street	\$1,651,400	100
4 County Shed	1520 - 3rd Avenue South	\$267,300	10
5 Post Office	605 - 2nd Avenue North	\$243,100	10
6 EMS Ambulance Service	15 North 1st Street	\$118,500	3
7 City Street Garage	120 South 5th Street	\$150,864	2
8a High School	1520 Central Avenue	\$12,986,600	See 18c
8b Law Center	114 North 6th Street	\$824,300	See 2a
8c Iowa Lakes College	300 South 18th Street	\$5,256,400	1000
9 Wastewater treatment Plant	1878 Hwy 4 South	\$4,180,500	7
10 Water Plant	201 - 1st Avenue North	\$246,300	4
11 City Wells - Well #4	150' NE of WS 1st St & W 2nd Ave S	\$252,800	0
11a Well #7	City Park bet 3rd & 5th Ave S & S 14th & 15th St	\$20,200	0
11b Well #8	201 - 1st Avenue North	With 10	0
11c Well #9	300' SE of S 2nd St & 2nd Ave S	\$1,100	2
11d Well #10	Hwy 4 South & South 1st Street	\$8,900	0
12 Electrical Substation	South of 15 North 1st Street	\$118,500	0
13 Water Tower at plant	201 - 1st Avenue North	\$294,357	4
13a West Tower	365th Avenue & 170th Street	\$595,893	0
13b Standpipe Water Tower	WN 4th Street	\$278,368	0
13c Water Tower	N 8th St North of 14th Avenue North	\$458,048	0
13d Water Tower	West of 1520 - 6th Avenue North	\$535,587	0
14 Outdoor warning Sirens	Refer to map		0
15 Municipal Utilities Building (Elect Dist)	20 North 1st Street	\$621,758	8
15a Power Plant	21 North 1st Street	\$12,975,901	3
16 Natural Gas Border Station	05-09-427-003	\$29,700	0
17 Natural Gas Main	Refer to map		0

18a	Roosevelt Elementary	315 North 6th Street	All Schools	200
18b	Middle School	1430 - 1st Avenue South	Combined	600
18c	High School	1520 Central Avenue	\$12,986,600	400
18d	Demoney Elementary	109 South 17th Street	With 18c	400
18e	ILCC	300 South 18th Street	See 8c	See 8c
19a	Good Samaritan Retirement Home	1646 - 5th Avenue North	\$443,216	100
19b	Rosewood Manor Retirement Home	2001 - 1st Avenue North	\$892,300	100
20 a	Trinity	721 - 18th Avenue North	\$790,200	200
20 b	Redeemer	1215 North 15th Street	\$575,900	200
20 c	Grandview	3705 - 170th Street	\$587,800	200
20 d	Estherville Lutheran	208 North 8th Street	\$476,900	200
20 e	Christian Church	205 North 7th Street	\$432,100	200
20 f	Church Of Christ	703 - 2nd Avenue North	\$862,100	200
20 g	Emmanuel Lutheran	409 North 6th Street	\$632,300	200
20 h	Catholic	903 Central Avenue	\$1,476,300	200
20 I	Methodist	102 South 8th Street	\$890,800	200
20 j	Presbyterian	723 - 1st Avenue North	\$882,500	300
20 k	Baptist	16 North 16th Street	\$261,600	200
20 l	Gospel Assembly	21 North 8th Street	\$350,000	200
20 m	Hispanic Church	1021 - 6th Avenue South	\$40,900	50
20 n	Crossroads	2015 - 3rd Avenue South	\$409,100	200
21	Daycare	214 West 2nd Avenue North	\$118,300	10
22	Library	613 Central Avenue	\$2,113,500	50
23	College	300 South 18th Street	See 8c	See 8c
24	Community Center	6 North 7th Street	See 1	100
25	Hospital	826 North 8th Street	See 3b	100
26a	Ferral Gas	1102 - 8th Avenue South	\$41,200	5
26b	Asmus Farm	603 South 28th Street	\$348,600	10
26c	Housemans	108 South 3rd Street	\$69,700	10
26d	Eville Foods	105 North 4th Street	\$3,229,000	100
27	Hazardous materials production	Refer to map		
28a	GKN	2420 - 7th Avenue South	\$3,450,000	200
28b	Aero Wheels	703 South 28th Street	\$819,900	60
28c	Eville Foods	105 North 4th Street	See 26d	See 26d
28d	Dakota Pack	2421 - 9th Avenue South	\$583,600	30

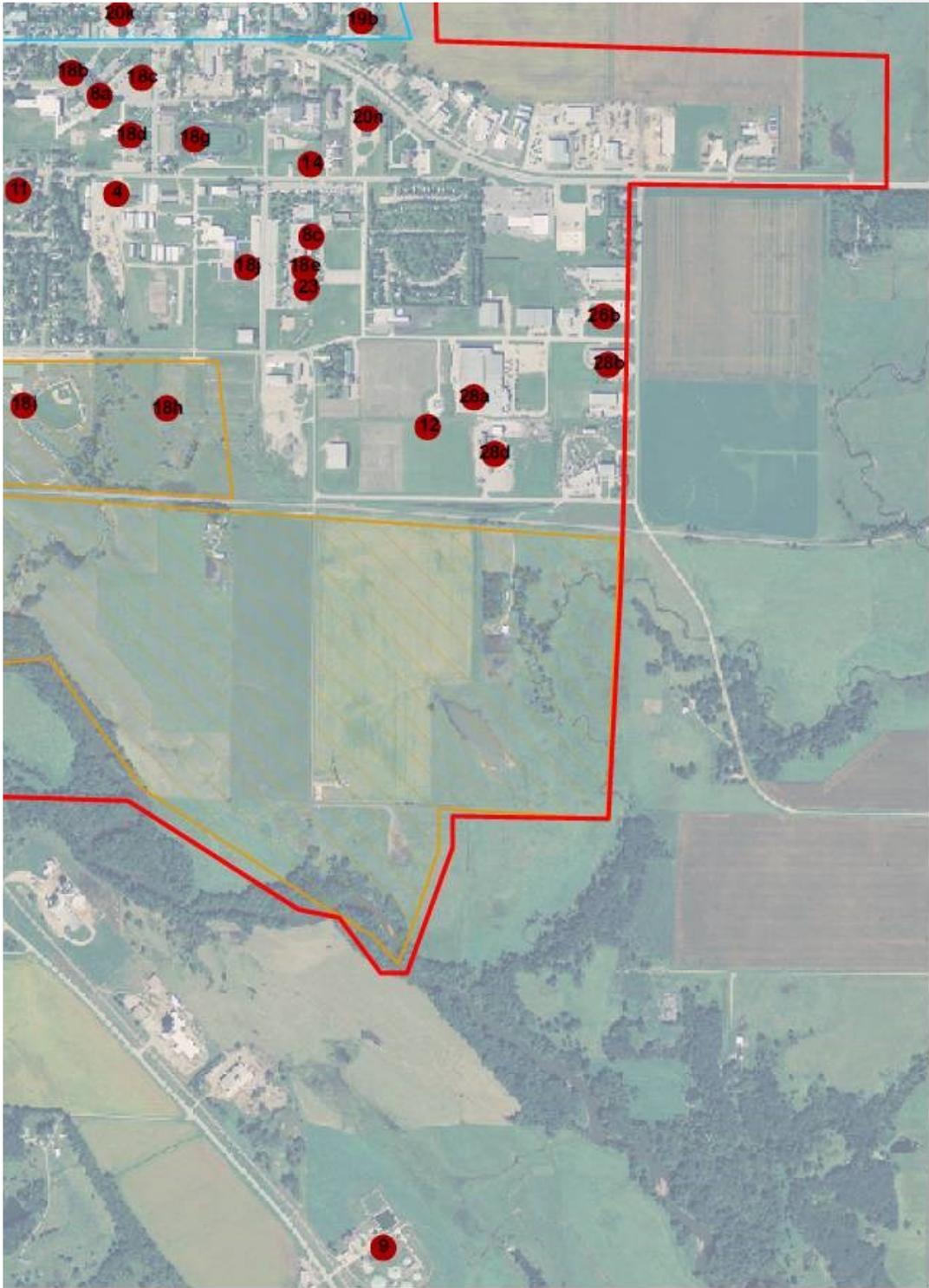
Estherville











Land Use and Development

There have not been any significant changes in land use or development (i.e. residential, commercial, or industrial) within the City of Estherville since the previous City Hazard Mitigation Plan. There have not been any changes in land use patterns or development in hazard prone areas (i.e. flash flood, river flood, landslide, grass & wildland fire). The lack of development is evident by the fact the City's population is decreasing and the local economy is not changing or growing. The City's population as depicted in the U.S. Census for years 2000 and 2010 resulted in the City's population declining 296 persons or -4.45% from 6,656 to 6,360. Currently there is no evidence of any significant future development to take place or changes in development and land use patterns for the foreseeable future; especially in hazard prone areas. The population is expected to decrease additionally from 2010 to 2020/

Hazard Risk Assessment

The Emmet County Hazard Mitigation Planning Committee determined the countywide hazard rankings. The city was also provided with information and statistics relevant to hazards affecting Estherville, including records of past events and damages. The city was asked to review the information from the countywide rankings and determine if highest risk hazards for the county applied to Estherville, and if not, how Estherville's situation differs from the county. Based on this discussion, prevalent hazards were determined for Estherville. Along with the information and statistics provided, the people present were asked to draw upon their knowledge and experiences of hazards affecting Estherville. After the discussion among the planning team, it was decided that the City of Estherville would re-prioritize the hazards of the countywide ranking for their jurisdictional portion of the plan.

It is recognized that Estherville may be susceptible to other hazards, such as the other hazards in the State of Iowa Hazard Mitigation Plan, but those hazards are not considered to be a high risk and are not examined at this time. However, if it is later determined that a hazard affecting Estherville does pose a higher risk than originally determined, it will be examined at that time or when the plan is updated.

4.2 – Hazard Ranking	
1	Severe Winter Storm
2	Windstorm
3	Grass and Wildland Fire
4	River Flood
5	Hailstorm
6	Extreme Heat
7	Thunderstorm and Lightning
8	Flash Flood
9	Tornado
10	Drought
11	Levee Failure
12	Landslide
13	Dam Failure

Source: Emmet County Planning Committee

**This hazard scoring, which was completed by the Emmet County Hazard Mitigation Planning Team, was used for all jurisdictions in Emmet County. The hazard ranking comprised from the scoring was given to each jurisdiction and the jurisdictions identified which hazards could impact them and re-ranked the hazards according to their historical knowledge of their community.*

Iowa Identified Mitigation Actions

The following are the actions that were identified by the local planning committee:

- Enforce Tree Trimming
- Back up Power Generators (buy)
- Bury Utility Lines
- NOAA Weather Radios (buy /distribute)
- Designating Community Shelter
- Purchase Snow Plow/Truck
- Monitor Levees and dams
- Good Neighbor Program
- Outdoor Warning Sirens (build or update)
- Watershed study & Implement
- Promote Landscaping Practices
- Build Saferoom – Thoresen Park
- Building/Zoning Codes
- Continue HAZMAT Training (Mason City)
- Continue Fire Dept Training
- Snow Removal Policy
- List of Storm Shelters
- Public Education/Awareness
- Maintain Outdoor Warning Sirens
- Update/Create Local Emergency Plan
- Replace Sewer Lines
- Purchase Portable Pumps
- Fire Gear PPE
- List of those of elderly, disabled or medically distressed
- Shelter rations (cots, blankets, water, etc)
- Backup of City/County Records
- Enforce Burn Bans
- Affirm Rural Water Connection
- Sandbags
- Determine which areas are most prone to flood
- Remain Compliant with NFIP
- Reaffirm Mutual AID
- Maintain sand bagging plan
- Enforce Floodplain ordinance
- Test warning sirens monthly
- Review/update Local operations Plan

The Estherville County Planning Team and Emmet County are responsible for overseeing the implementation of this plan. Emmet County Emergency Management and other county and local agencies will assist with implementing and administering this plan. The mitigations actions were discussed with a high, medium and low priority ranking in mind. **High (H)** – Jurisdictions valued this as something that had the highest effect on helping the community and people survive severe weather events. Also the cost could be easily obtained or funding has already been set aside. **Medium (M)** – These were valued at the jurisdictions as projects that where ranked in between the other two priority groups. **Low (L)** – These mitigation actions have the least effect on protecting human life from severe weather events and therefore have been given the lowest priority. Or the cost is too high at this point in time and makes it unlikely to be acted upon in present future. Priorities for each mitigation action are discussed in the Mitigation Actions, Section 6. Another factor in the implementation of the mitigation actions was their benefit versus how much the project would cost. Economics of implementing mitigation actions were considered when the planning team discussed the priority of projects. Cost estimates were given by the Emmet County Planning Committee to help display which actions were of a higher importance and fit in the economic goals of the county/cities/schools. Those

estimates can be reference in Section 6. The Implementation Schedule for the mitigation activities, whether ongoing or considered, will be subject to the availability of Federal, State, and local funding. Continuing (ON) = Ongoing (responsible entity regularly participates in or supports); Short Term (ST) = 1-5 years to initiate or accomplish; and Long Term (LT) = 5 or more years to initiate or accomplish.

Once the plan is completed, approved, and adopted, local governments will be eligible for funding assistance from FEMA for mitigation strategies put forth in the plan. Potential funding resources include the FEMA Pre-Disaster Mitigation Program (PDM) and FEMA Hazard Mitigation Grant Program (HMGP). No timeframe was identified in implementing these mitigation actions will be acted upon as funding become available. It was discussed that additional mitigation actions would be examined during the update process. The mitigation actions that were discussed were what the Estherville Planning Committee wanted to have included in the hazard mitigation plan.

Plan Maintenance

Plan maintenance involves taking action to ensure that the plan stays current with information, priorities are still in order, and goals and objectives are maintained and updated. To accomplish this, the plan will be reviewed by the planning team annually and be incorporated into other city plans. Additionally, a comprehensive update is required at least once every 5 years and submitted to FEMA for certification. The revised plan will be adopted by the city council. To assist with the update, information is to be collected by the city annually to document efforts, hazard events, and other pertinent activities to mitigate hazards. Part of plan maintenance is maintaining the planning team. The planning team is composed of local elected officials, city employees and other interested parties. This is an important part of plan maintenance in order to reconvene the planning team when necessary.

Monitoring

The Estherville Planning Team and Emmet County Emergency Management are responsible for monitoring this portion of the plan. The plan will be monitored based on the mitigation strategies identified in the plan and the reported progress to accomplish the work. Projects that are complete will be monitored for effectiveness. Any strategies that are removed from the plan will be examined and documented. An annual reporting sheet is included in this plan for the city to keep track of the mitigation process.

Incorporation into Existing Plans

The city is responsible for reviewing its local plans, codes, and ordinances and amending documents as they see appropriate. As appropriate, information and actions from this plan will be incorporated into comprehensive or community builder plans during review and update processes. A worksheet is provided to record what information from this plan is incorporated to other plans.

Continued Public Participation

The public will be involved in the implementation of the plan at city council meetings and general public meetings. Mitigation actions and implementation strategies will be discussed at city council meetings and an opportunity for public input will be encouraged. This process will ensure opportunity for public awareness of hazards and threats faced by the community and actions planned to eliminate or reduce impacts. To promote continued public participation, meetings where the plan will be discussed will have public notice posted.

Section 9.5 Gruver

Planning Committee Members:

Mary Ann Hoffmeyer	City Clerk
Brent Baddeley	Council
Tony Hanson	Council
Brett Gremes	Council
Bob Gommels	Council
Rick Wolfe	Council
Loren Anderson	Mayor
Dan Harvey	Fire Chief
Wes Baddeley	Assistant Fire Chief

City Contact:

Mary Ann Hoffmeyer – City Clerk 712-362-5050

Planning Process

Meetings were held throughout the planning process to collect information and share that information with the general public and the planning team. Notices for meetings were posted at city hall where the meeting was being held. Agendas and minutes for meetings are included in the Appendix.

Utilities

Water

Name:	Iowa Lakes Regional Water		
Location:	Gruver, Iowa (Emmet)		
Phone:	712-262-8847	Web Address:	www.ilrw.org

Sewer

Name:	Iowa Lakes		
Phone:	712-262-8847	Web Address:	www.ilrw.org

Electric

Name:	Alliant Energy		
Location:	Gruver, IA (Emmet)		
Phone:	1-800-255-4268	Web Address:	www.alliantenergy.com

Natural Gas – None or private LP tanks

Telecommunications

Providers: Century Link, Web Wireless, Dish Network, Wild Blue

Infrastructure

Solid Waste and Recycling	Harris Sanitation
Curb and Gutter	No
Waste Water Treatment	Yes, Iowa Lakes Regional

How Many Cell Lagoon Two
 Floodplain Ordinance No
 Floodplain Compliance Officer (For assistance in the administration of the floodplain regulations, contact the Iowa Department of Natural Resources)

Future Plans and Mechanisms

The City of Gruver planning committee stated they would try to incorporate the mitigation strategies developed in the plan in their community actions and other community planned documents if they occur. The committee also stated they would draw from other community mechanisms when applicable to add into the mitigation strategies and mitigation requirements of their hazard mitigation plan.

In preparation of this plan, existing plans and other technical information was considered. The purpose of this review was to give consideration to existing information before setting future mitigation goals.

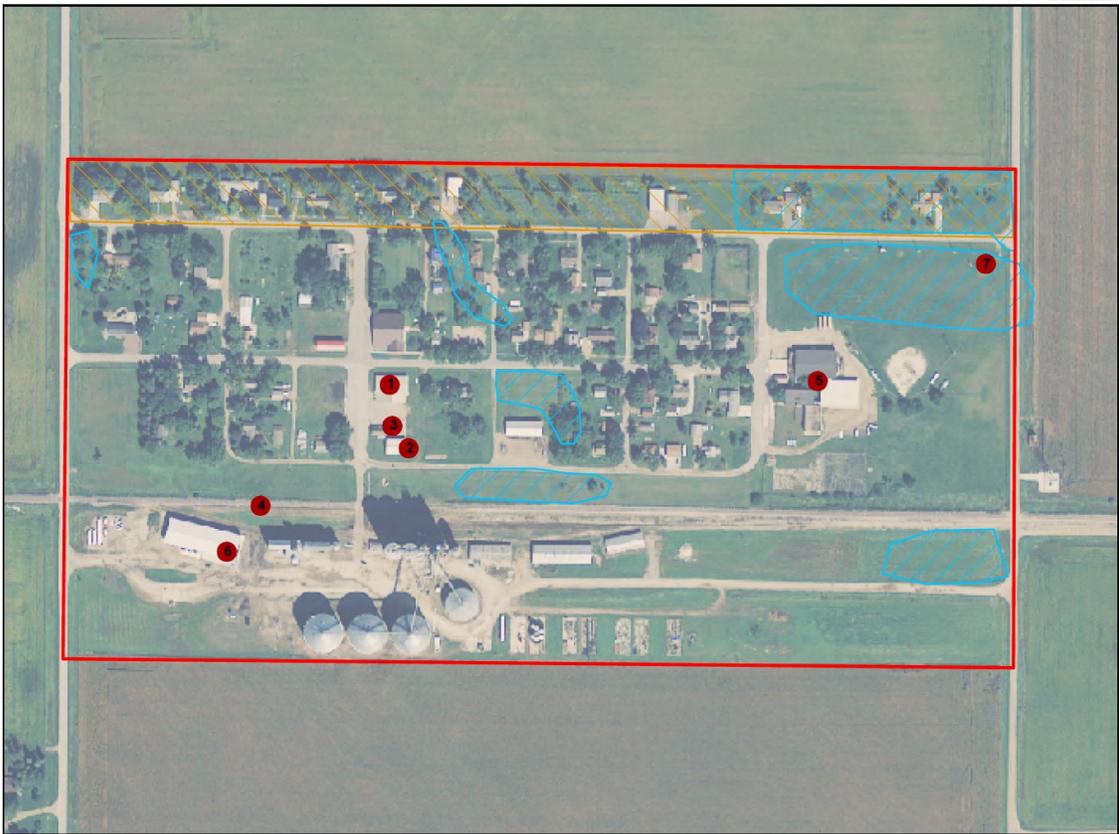
Plan/Document	If yes last year updated	Plan/Document	If yes last year updated
Comprehensive/Landuse plan	Yes	Capital Improvement Plan	No
Local Emergency Plan	No	Local Recovery Plan	No
Local Mitigation Plan	Yes 2005	County Mitigation Plan	Yes 2013
Economic Development Plan	No	Flood Ordinance or Plan	No
School Mitigation Plan	No	Zoning Ordinance	Yes
Building Code	Yes	Subdivision	No
Tree Trimming Ordinance	No	Nuisance Ordinance	Yes
Storm Water Ordinance	No		

Emergency Services

Fire Rescue Dept 7 Volt fire fighter trained at HazMat Awareness/Ops
 14 Volt Firefighters trained at FF1
 3 Volt Firefighters trained at FF2
 14 Volt Firefighters trained at incident command level
 0 Volt Emergency Rescue Technician (ERT)
 1 Volt Emergency Medical Technician (EMTB)
 0 Paramedics
 0 EMTI
 0 Nurse
 Fire equipment at station 2 Tankers, pumper, grass rig and attack rig
 Covers Dolliver and several townships
 Law Enforcement 28-E with Emmet County Sherriff
 Emergency Warning System Yes, 1 sirens
 Flood fighting plan No
 Sandbagging plan No
 Evacuation/rescue plan No

Critical Facilities and Assessed Values

Gruver Critical Facility		Address	Value	Peak Population
1	City Offices/Fire Dept	110 3 rd St.	\$82,500	200
2	City Maintenance	100 3 rd St	\$12,700	3
3	Outdoor Warning Siren	100 3 rd St	\$12,000	n/a
4	Railroad	Refer to map		n/a
5	Forest Ridge Youth Service	200 6 th St.	\$388,900	150
6	Hazardous Material Storage.	300 Railroad Ave	\$2,566,800	30
7	Back up Generator for Sewer	Refer to map	\$14,000	



Land Use and Development

There have not been any significant changes in land use or development (i.e. residential, commercial, or industrial) within the City of Gruver since the previous City Hazard Mitigation Plan. There are no new businesses, industries, or residential development (construction of new structures for businesses, industries, or residential) since the last City Hazard Mitigation Plan were adopted. There have not been any changes in land use patterns or development in hazard prone areas (i.e. flash flood, river flood, grass & wildland fire). The lack of development is evident by the fact the City's population is decreasing and the local economy is not changing or growing. The City's population as depicted in the U.S. Census for years 2000 and 2010 resulted in the City's population declining 12 persons or -11.76% from 106 to 94 persons. Currently there is no evidence of any significant future development to take place or changes in development and land use patterns for the foreseeable future; especially in hazard prone areas. The City's population is expected to hold steady between years 2010 to 2020.

Hazard Risk Assessment

The Emmet County Hazard Mitigation Planning Committee determined the countywide hazard rankings. The city was also provided with information and statistics relevant to hazards affecting Gruver, including records of past events and damages. The city was asked to review the information from the countywide rankings and determine if highest risk hazards for the county applied to Gruver, and if not, how Gruver's situation differs from the county. Based on this discussion, prevalent hazards were determined for Gruver. Along with the information and statistics provided, the people present were asked to draw upon their knowledge and experiences of hazards affecting Gruver. After the discussion among the planning team, it was decided that the City of Gruver would re-prioritize the hazards of the countywide ranking for their jurisdictional portion of the plan. The city eliminated many of the hazards that were in the countywide ranking, such as: landslide, river flood, dam failure, and levee failure. The planning team decided that those hazards did not apply to Gruver.

It is recognized that Gruver may be susceptible to other hazards, such as the other hazards in the State of Iowa Hazard Mitigation Plan, but those hazards are not considered to be a high risk and are not examined at this time. However, if it is later determined that a hazard affecting Gruver does pose a higher risk than originally determined, it will be examined at that time or when the plan is updated.

Hazard Ranking-City of Gruver	
Ranking	Hazard
1	Severe Winter Storm
2	Windstorm
3	Grass or Wildland Fire
4	Hailstorm
5	Extreme Heat
6	Thunderstorms and Lightning
7	Flash Flood
8	Tornado
9	Drought

**This hazard scoring, which was completed by the Emmet County Hazard Mitigation Planning Team, was used for all jurisdictions in Emmet County. The hazard ranking comprised from the scoring was given to each jurisdiction and the jurisdictions identified which hazards could impact them and re-ranked the hazards according to their historical knowledge of their community.*

Iowa Identified Mitigation Actions

The following are the actions that were identified by the local planning committee:

- Back up Power Generators (buy) – For warming/cooling city hall
- Bury Utility Lines
- Designating Community Shelter
- Purchase Snow Plow/Truck
- Good Neighbor Program
- Look into NFIP Participation
- Outdoor Warning Sirens (build or update)
- Building/Zoning Codes
- Continue HAZMAT Training (Mason City)
- Continue Fire Dept Training
- Snow Removal Policy
- List of Storm Shelters
- Public Education/Awareness
- Maintain Outdoor Warning Sirens
- Clean/Enlarge Sewage Lagoons
- Replace Sewer Lines
- Fire Gear PPE
- List of those of elderly, disabled or medically distressed
- Create Dry Hydrants
- Affirm Rural Water Connection
- Sandbags
- Determine which areas are most prone to flood
- Reaffirm Mutual AID
- Paramedic equipment
- Test warning sirens monthly
- Maintain Rescue Equipment
- Alternate Water Supply Plan
- Clean up equipment list
- Fuel tanks for emergencies

The Gruver Planning Team and Emmet County are responsible for overseeing the implementation of this plan. Emmet County Emergency Management and other county and local agencies will assist with implementing and administering this plan. The mitigations actions were discussed with a high, medium and low priority ranking in mind. **High (H)** – Jurisdictions valued this as something that had the highest effect on helping the community and people survive severe weather events. Also the cost could be easily obtained or funding has already been set aside. **Medium (M)** – These were valued at the jurisdictions as projects that were ranked in between the other two priority groups. **Low (L)** – These mitigation actions have the least effect on protecting human life from severe weather events and therefore have been given the lowest priority. Or the cost is too high at this point in time and makes it unlikely to be acted upon in present future. Priorities for each mitigation action are discussed in the Mitigation Actions, Section 6. Another factor in the implementation of the mitigation actions was their benefit versus how much the project would cost. Economics of implementing mitigation actions were considered when the planning team discussed the priority of projects. Cost estimates were given by the Emmet County Planning Committee to help display which actions were of a higher importance and fit in the economic goals of the county/cities/schools. Those estimates can be reference in Section 6. The Implementation Schedule for the mitigation activities, whether ongoing or considered, will be subject to the availability of Federal, State, and local funding. Continuing (ON) = Ongoing (responsible entity regularly participates in or supports); Short Term (ST) = 1-5 years to initiate or accomplish; and Long Term (LT) = 5 or more years to initiate or accomplish.

Once the plan is completed, approved, and adopted, local governments will be eligible for funding assistance from FEMA for mitigation strategies put forth in the plan. Potential funding resources include the FEMA Pre-Disaster Mitigation Program (PDM) and FEMA Hazard Mitigation Grant Program (HMGP). No timeframe was identified in implementing these mitigation actions will be acted upon as funding become available. It was discussed that additional mitigation actions would be examined during the update process. The mitigation actions that were discussed were what the Gruver Planning Committee wanted to have included in the hazard mitigation plan.

Plan Maintenance

Plan maintenance involves taking action to ensure that the plan stays current with information, priorities are still in order, and goals and objectives are maintained and updated. To accomplish this, the plan will be reviewed by the planning team annually and be incorporated into other city plans. Additionally, a comprehensive update is required at least once every 5 years and submitted to FEMA for certification. The revised plan will be adopted by the city council. To assist with the update, information is to be collected by the city annually to document efforts, hazard events, and other pertinent activities to mitigate hazards. Part of plan maintenance is maintaining the planning team. The planning team is composed of local elected officials, city employees and other interested parties. This is an important part of plan maintenance in order to reconvene the planning team when necessary.

Monitoring

The Gruver Planning Team and Emmet County Emergency Management are responsible for monitoring this portion of the plan. The plan will be monitored based on the mitigation strategies identified in the plan and the reported progress to accomplish the work. Projects that are complete will be monitored for effectiveness. Any strategies that are removed from the plan will be examined and documented. An annual reporting sheet is included in this plan for the city to keep track of the mitigation process.

Incorporation into Existing Plans

The city is responsible for reviewing its local plans, codes, and ordinances and amending documents as they see appropriate. As appropriate, information and actions from this plan will be incorporated into comprehensive or community builder plans during review and update processes. A worksheet is provided to record what information from this plan is incorporated to other plans.

Continued Public Participation

The public will be involved in the implementation of the plan at city council meetings and general public meetings. Mitigation actions and implementation strategies will be discussed at city council meetings and an opportunity for public input will be encouraged. This process will ensure opportunity for public awareness of hazards and threats faced by the community and actions planned to eliminate or reduce impacts. To promote continued public participation, meetings where the plan will be discussed will have public notice posted.

Section 9.6 Ringsted

Planning Committee Members:

Dan Jorgensen	Mayor
Wayne Kruse	Council
Daryl Anderson	Council
Cathy Wikert	City Clerk
Jodie White	Council
Billy Hansen	Council
Ken Lowerly	Council
David Merrill	Fire
Max Cole	Maintenance

City Contact:

Cathy Wikert City Clerk – 712-866-0877

Planning Process

Meetings were held throughout the planning process to collect information and share that information with the general public and the planning team. Notices for meetings were posted at city hall where the meeting was being held. Agendas and minutes for meetings are included in the Appendix.

Utilities

Water

Name:	Ringsted Water Supply		
Location:	Ringsted, Iowa		
Well Avg Depth (ft):	309	Peak Demand (mgd):	0.090/.084(2012)
Treated:	Yes	Cost/1000 Gal:	Permit
Rated Capacity (mgd):	0.153	Storage Capacity (gal):	55,000
Temp Range (F):		Major Source:	Dakota Sandstone
Avg Capacity (mgd):	0.049/.030(2012)	Hardness (ppm):	0.0
Connection Fee:	Permit		
Phone:	712-866-0877	Web Address:	None

Sewer

Name:	City of Ringsted		
Location:	Ringsted, Iowa		
Ownership Type:	Municipal	Average Daily Demand (mgd):	0.032
Rated Capacity (mgd):	0.077	Peak Demand (mgd):	0.060
Cost/1000 Gal:		Connection Fee:	
Phone:	712-866-0877	Web Address:	

Electric

Name:	Alliant
Location:	

Natural Gas

Name: Mid American
Phone: 712-284-1036 **Web Address:** www.midamericanenergy.com

Telecommunications

Name: RingTel Communications
Phone: 1-712-866-8000 **Web Address:** www.tingtelco.com

Infrastructure

Solid Waste and Recycling Yes, Shamrock
Curb and Gutter Yes
Waste Water Treatment Yes
How Many Cell Lagoon 1 Cell
Floodplain Ordinance No
Floodplain Compliance Officer Terry Reekers (For assistance in the administration of the floodplain regulations, contact the Iowa Department of Natural Resources)

Future Plans and Mechanisms

The City of Ringsted planning committee stated they would try to incorporate the mitigation strategies developed in the plan in their community actions and other community planned documents if they occur. The committee also stated they would draw from other community mechanisms when applicable to add into the mitigation strategies and mitigation requirements of their hazard mitigation plan.

In preparation of this plan, existing plans and other technical information was considered. The purpose of this review was to give consideration to existing information before setting future mitigation goals.

Plan/Document	If yes last year updated	Plan/Document	If yes last year updated
Comprehensive/Landuse plan	Yes	Capital Improvement Plan	No
Local Emergency Plan	Yes	Local Recovery Plan	No
Local Mitigation Plan	No	County Mitigation Plan	Yes 2013
Economic Development Plan	No	Flood Ordinance or Plan	No
School Mitigation Plan	No	Zoning Ordinance	Yes
Building Code	Yes	Subdivision	No
Tree Trimming Ordinance	Yes	Nuisance Ordinance	Yes
Storm Water Ordinance	Yes		

Emergency Services

Fire Rescue Dept 7 Volt fire fighter trained at HazMat Awareness/Ops
9 Volt Firefighters trained at FF1
0 Volt Firefighters trained at FF2
4 Volt Firefighters trained at incident command level
0 Volt Emergency Rescue Technician (ERT)
2 Volt Emergency Medical Technician (EMTB)
0 Paramedics
0 EMTI

Fire equipment at station	0 Nurse 2 Pumpers, 2 tankers, 1 quick attack, 1 ambulance
Law Enforcement	28-E with Emmet County Sherriff
Emergency Warning System	1
Flood fighting plan	No
Sandbagging plan	No
Evacuation/rescue plan	NO

Critical Facilities and Assessed Values

Ringsted Critical Facility	Address	Value	Peak Population	
1	City Offices	112 W Maple	21,900	20
2	Fire Dept/Ambulance	17 N 1 st St	38,700	40
3	City Maintenance	24 S Larch St	4,200	6
4	Post Office	102 W Maple	40,400	15
5	Wastewater Treatment	2356 550 th Ave	28,700	2
6	Water Plant	21 Elm	3,200	4
7	240 th St	Refer to map	n/a	0
8	City Well	21 Elm St	15,000	2
9	Water tower/Siren	21 Elm St	230,700	2
10a	Church	208 W Maple St	180,500	300
10b	Church	401 Heritage St	13,500	250
11	Library	8 Maple St	50,000	50
12	Hazardous Material Storage	Refer to map	36,000	10
12a	Anhydrous Building	3 West 240 th St	75,000	6
12b	Dukes	Refer to map	50,000	6
13	County Maintenance	Refer to map	75,000	6

Land Use and Development

There have not been any significant changes in land use or development (i.e. residential, commercial, or industrial) within the City of Ringsted since the previous City Hazard Mitigation Plan. There are no new businesses or industries (construction of new structures for businesses or industries) and very little housing development since the last City Hazard Mitigation Plan were adopted. There have not been any changes in land use patterns or development in hazard prone areas (i.e. flash flood, river flood, grass & wildland fire). The lack of development is evident by the fact the City's population is decreasing and the local economy is not changing or growing. The City's population as depicted in the U.S. Census for years 2000 and 2010 resulted in the City's population declining 14 persons or -3.21% from 436 to 422 persons. Currently there is no evidence of any significant future development to take place or changes in development and land use patterns for the foreseeable future; especially in hazard prone areas. The City's population is expected to decline additionally from years 2010 to 2020.



Hazard Risk Assessment

The Emmet County Hazard Mitigation Planning Committee determined the countywide hazard rankings. The city was also provided with information and statistics relevant to hazards affecting Ringsted, including records of past events and damages. The city was asked to review the information from the countywide rankings and determine if highest risk hazards for the county applied to Ringsted, and if not, how Ringsted’s situation differs from the county. Based on this discussion, prevalent hazards were determined for Ringsted. Along with the information and statistics provided, the people present were asked to draw upon their knowledge and experiences of hazards affecting Ringsted. After the discussion among the planning team, it was decided that the City of Ringsted would re-prioritize the hazards of the countywide ranking for their jurisdictional portion of the plan. The city eliminated many of the hazards that were in the countywide ranking, such as: landslide, river flood, and dam failure. The planning team decided that those hazards did not apply to Ringsted.

It is recognized that Ringsted may be susceptible to other hazards, such as the other hazards in the State of Iowa Hazard Mitigation Plan, but those hazards are not considered to be a high risk and are not examined at this time. However, if it is later determined that a hazard affecting Ringsted does pose a higher risk than originally determined, it will be examined at that time or when the plan is updated.

4.2 – Hazard Ranking	
1	Severe Winter Storm
2	Windstorm
3	Grass and Wildland Fire
4	Hailstorm
5	Extreme Heat
6	Thunderstorm and Lightning
7	Flash Flood
8	Tornado
9	Drought
10	Levee Failure

Source: Emmet County Planning Committee

**This hazard scoring, which was completed by the Emmet County Hazard Mitigation Planning Team, was used for all jurisdictions in Emmet County. The hazard ranking comprised from the scoring was given to each jurisdiction and the jurisdictions identified which hazards could impact them and re-ranked the hazards according to their historical knowledge of their community.*

Iowa Identified Mitigation Actions

The following are the actions that were identified by the local planning committee:

- Enforce Tree Trimming
- Back up Power Generators (buy) - mobile
- Bury Utility Lines
- NOAA Weather Radios (buy /distribute)
- Designating Community Shelter
- Monitor Levees and dams
- Look into NFIP Participation
- Purchase Snow Plow/Truck
- Good Neighbor Program
- Outdoor Warning Sirens (build or update)
- Continue HAZMAT Training (Mason City)
- Continue Fire Dept Training
- Snow Removal Policy
- Public Education/Awareness
- Maintain Outdoor Warning Sirens
- Update/Create Local Emergency Plan
- Clean/Enlarge Sewage Lagoons

- Replace Sewer Lines
- Purchase Portable Pumps
- Fire Gear PPE
- List of those of elderly, disabled or medically distressed
- Backup of City/County Records
- Enforce Burn Bans
- Reaffirm Mutual AID
- Test warning sirens monthly
- Deeper well
- Water Restriction Plan

The Ringsted Planning Team and Emmet County are responsible for overseeing the implementation of this plan. Emmet County Emergency Management and other county and local agencies will assist with implementing and administering this plan. The mitigations actions were discussed with a high, medium and low priority ranking in mind. **High (H)** – Jurisdictions valued this as something that had the highest effect on helping the community and people survive severe weather events. Also the cost could be easily obtained or funding has already been set aside. **Medium (M)** – These were valued at the jurisdictions as projects that were ranked in between the other two priority groups. **Low (L)** – These mitigation actions have the least effect on protecting human life from severe weather events and therefore have been given the lowest priority. Or the cost is too high at this point in time and makes it unlikely to be acted upon in present future. Priorities for each mitigation action are discussed in the Mitigation Actions, Section 6. Another factor in the implementation of the mitigation actions was their benefit versus how much the project would cost. Economics of implementing mitigation actions were considered when the planning team discussed the priority of projects. Cost estimates were given by the Emmet County Planning Committee to help display which actions were of a higher importance and fit in the economic goals of the county/cities/schools. Those estimates can be reference in Section 6. The Implementation Schedule for the mitigation activities, whether ongoing or considered, will be subject to the availability of Federal, State, and local funding. Continuing (ON) = Ongoing (responsible entity regularly participates in or supports); Short Term (ST) = 1-5 years to initiate or accomplish; and Long Term (LT) = 5 or more years to initiate or accomplish.

Once the plan is completed, approved, and adopted, local governments will be eligible for funding assistance from FEMA for mitigation strategies put forth in the plan. Potential funding resources include the FEMA Pre-Disaster Mitigation Program (PDM) and FEMA Hazard Mitigation Grant Program (HMGP). No timeframe was identified in implementing these mitigation actions will be acted upon as funding become available. It was discussed that additional mitigation actions would be examined during the update process. The mitigation actions that were discussed were what the Ringsted Planning Committee wanted to have included in the hazard mitigation plan.

Plan Maintenance

Plan maintenance involves taking action to ensure that the plan stays current with information, priorities are still in order, and goals and objectives are maintained and updated. To accomplish this, the plan will be reviewed by the planning team annually and be incorporated into other city plans. Additionally, a comprehensive update is required at least once every 5 years and submitted to FEMA for certification. The revised plan will be adopted by the city council. To assist with the update, information is to be collected by the city annually to document efforts, hazard events, and other pertinent activities to mitigate hazards. Part of plan maintenance is maintaining the planning team. The planning team is composed of local elected officials, city employees and other interested parties. This is an important part of plan maintenance in order to reconvene the planning team when necessary.

Section 9.7 Wallingford

Planning Committee Members:

Jeremy Bodle	Council
Betsy Dostal	Council
Ron Sabby	Council
Linda Mickelson	Council
Terry Osher	Mayor
Jarrold Fischer	Council
Terry Reekers	Emergency Management
Ann Van DeWalle	City Clerk/Finance Director

City Contact:

Ann Van DeWalle City Clerk – 712-867-4585

Planning Process

Meetings were held throughout the planning process to collect information and share that information with the general public and the planning team. Notices for meetings were posted at city hall where the meeting was being held. Agendas and minutes for meetings are included in the Appendix.

Utilities

Water

Name: City of Estherville

Sewer

Name: City of Wallingford

Location: SE portion of Wallingford

Electric

Name: Alliant

Phone: **Web Address:**

Natural Gas

Name: Black Hills Energy

Telecommunications

Name: River Valley Telephone

Phone: 712-859-3300 **Web Address:** www.home.rvtc.net

Infrastructure

Solid Waste and Recycling	Harris Sanitation Every Wednesday
Curb and Gutter	No
Waste Water Treatment	City of Estherville Grade 4 mechanical plant
How Many Cell Lagoon	3 Cell

Floodplain Ordinance Yes
 Floodplain Compliance Officer Terry Reekers (For assistance in the administration of the floodplain regulations, contact the Iowa Department of Natural Resources)

Future Plans and Mechanisms

The City of Wallingford planning committee stated they would try to incorporate the mitigation strategies developed in the plan in their community actions and other community planned documents if they occur. The committee also stated they would draw from other community mechanisms when applicable to add into the mitigation strategies and mitigation requirements of their hazard mitigation plan.

In preparation of this plan, existing plans and other technical information was considered. The purpose of this review was to give consideration to existing information before setting future mitigation goals.

Plan/Document	If yes last year updated	Plan/Document	If yes last year updated
Comprehensive/Landuse plan	Yes	Capital Improvement Plan	No
Local Emergency Plan	No	Local Recovery Plan	Yes
Local Mitigation Plan	No	County Mitigation Plan	Yes 2013
Economic Development Plan	No	Flood Ordinance or Plan	Yes
School Mitigation Plan	No	Zoning Ordinance	Yes
Building Code	No	Subdivision	No
Tree Trimming Ordinance	Yes	Nuisance Ordinance	Yes
Storm Water Ordinance	No		

Emergency Services

Fire Rescue Dept 23 Volt fire fighter trained at HazMat Awareness/Ops
 14 Volt Firefighters trained at FF1
 4 Volt Firefighters trained at FF2
 23 Volt Firefighters trained at incident command level
 0 Volt Emergency Rescue Technician (ERT)
 8 Volt Emergency Medical Technician (EMTB)
 0 Paramedics
 0 EMTI
 1 Nurse

Fire equipment at station Two Engines, Rescue Unit, One Tanker, Equipment Truck, Grass Rig

Law Enforcement 28-E with Emmet County Sherriff

Emergency Warning System No – Manual siren on fire dept

Flood fighting plan Cooperation with Emergency Management

Sandbagging plan Cooperation with Emergency Management

Evacuation/rescue plan Yes

Critical Facilities and Assessed Values

Wallingford Critical Facility	Address	Value	Peak Population
1 City Offices	101 St James	\$158,900	25
2 Post Office	18 St James	\$116,800	7
3 EMS/Ambulance	103 St James	\$109,500	9
4 Railroad	n/a		n/a
5 Airport	410 St James Ave	\$57,200	6
6 Wastewater Treatment Plant	408 St James	\$14,700	4
7 City Wells	103 St James	\$10,000	5
8 Natural Gas Border Station	Intersection of 230/Hwy4		2
9 Church	221 St James	\$339,900	150
10 Library	101 St James	\$49,400	25
11 Community Center	42 St James	\$28,400	90
12 Hazardous Material Storage	Winfield St	\$20,000	6

Land Use and Development

There have not been any significant changes in land use or development (i.e. residential, commercial, or industrial) within the City of Wallingford since the previous City Hazard Mitigation Plan. There are no new businesses, industries, or residential development (construction of new structures for businesses, industries, or residential) since the last City Hazard Mitigation Plan were adopted. There have not been any changes in land use patterns or development in hazard prone areas (i.e. flash flood, river flood, grass & wildland fire). The lack of development is evident by the fact the City’s population is decreasing and the local economy is not changing or growing. The City’s population as depicted in the U.S. Census for years 2000 and 2010 resulted in the City’s population declining 13 persons or -6.91% from 210 to 197 persons. Currently there is no evidence of any significant future development to take place or changes in development and land use patterns for the foreseeable future; especially in hazard prone areas. The City’s population is expected to hold steady to declining slightly from years 2010 to 2020.



Hazard Risk Assessment

The Wallingford Hazard Mitigation Planning Committee determined the countywide hazard rankings. The city was also provided with information and statistics relevant to hazards affecting Wallingford, including records of past events and damages. The city was asked to review the information from the countywide rankings and determine if highest risk hazards for the county applied to Wallingford, and if not, how Wallingford's situation differs from the county. Based on this discussion, prevalent hazards were determined for Wallingford. Along with the information and statistics provided, the people present were asked to draw upon their knowledge and experiences of hazards affecting Wallingford. After the discussion among the planning team, it was decided that the City of Wallingford would re-prioritize the hazards of the countywide ranking for their jurisdictional portion of the plan. The city eliminated many of the hazards that were in the countywide ranking, such as: landslide, and dam failure. The planning team decided that those hazards did not apply to Wallingford.

It is recognized that Wallingford may be susceptible to other hazards, such as the other hazards in the State of Iowa Hazard Mitigation Plan, but those hazards are not considered to be a high risk and are not examined at this time. However, if it is later determined that a hazard affecting Wallingford does pose a higher risk than originally determined, it will be examined at that time or when the plan is updated.

Hazard Ranking-City of Wallingford	
Ranking	Hazard
1	Severe Winter Storm
2	Windstorm
3	Grass and Wildland Fire
4	River Flood
5	Hailstorm
6	Extreme Heat
7	Thunderstorm and Lightning
8	Flash Flood
9	Tornado
10	Drought
11	Levee Failure

**This hazard scoring, which was completed by the Emmet County Hazard Mitigation Planning Team, was used for all jurisdictions in Emmet County. The hazard ranking comprised from the scoring was given to each jurisdiction and the jurisdictions identified which hazards could impact them and re-ranked the hazards according to their historical knowledge of their community.*

Iowa Identified Mitigation Actions

The following are the actions that were identified by the local planning committee:

- Enforce Tree Trimming
- Back up Power Generators (buy)
- Bury Utility Lines
- NOAA Weather Radios (buy /distribute)
- Designating Community Shelter
- Purchase Snow Plow/Truck
- Good Neighbor Program
- Monitor Levees and dams
- Tornado Safe Room (build)
- Outdoor Warning Sirens (build or update)
- Watershed study & Implement
- Promote Landscaping Practices
- Building/Zoning Codes
- Continue HAZMAT Training (Mason City)
- Continue Fire Dept Training
- Snow Removal Policy

- List of Storm Shelters
- Public Education/Awareness
- Maintain Outdoor Warning Sirens
- Update/Create Local Emergency Plan
- Clean/Enlarge Sewage Lagoons
- Construct Sewer Lift Station
- Replace Sewer Lines
- Install Riprap
- Purchase Portable Pumps
- Fire Gear PPE
- Backup of City/County Records
- Create Dry Hydrants
- Enforce Burn Bans
- Affirm Rural Water Connection
- Sandbags
- Determine which areas are most prone to flood
- Remain Compliant with NFIP
- Reaffirm Mutual AID
- Paramedic equipment

The Emmet County Planning Team and Emmet County are responsible for overseeing the implementation of this plan. Emmet County Emergency Management and other county and local agencies will assist with implementing and administering this plan. The mitigations actions were discussed with a high, medium and low priority ranking in mind. **High (H)** – Jurisdictions valued this as something that had the highest effect on helping the community and people survive severe weather events. Also the cost could be easily obtained or funding has already been set aside. **Medium (M)** – These were valued at the jurisdictions as projects that where ranked in between the other two priority groups. **Low (L)** – These mitigation actions have the least effect on protecting human life from severe weather events and therefore have been given the lowest priority. Or the cost is too high at this point in time and makes it unlikely to be acted upon in present future. Priorities for each mitigation action are discussed in the Mitigation Actions, Section 6. Another factor in the implementation of the mitigation actions was their benefit versus how much the project would cost. Economics of implementing mitigation actions were considered when the planning team discussed the priority of projects. Cost estimates were given by the Emmet County Planning Committee to help display which actions were of a higher importance and fit in the economic goals of the county/cities/schools. Those estimates can be reference in Section 6. The Implementation Schedule for the mitigation activities, whether ongoing or considered, will be subject to the availability of Federal, State, and local funding. Continuing (ON) = Ongoing (responsible entity regularly participates in or supports); Short Term (ST) = 1-5 years to initiate or accomplish; and Long Term (LT) = 5 or more years to initiate or accomplish.

Once the plan is completed, approved, and adopted, local governments will be eligible for funding assistance from FEMA for mitigation strategies put forth in the plan. Potential funding resources include the FEMA Pre-Disaster Mitigation Program (PDM) and FEMA Hazard Mitigation Grant Program (HMGP). No timeframe was identified in implementing these mitigation actions will be acted upon as funding become available. It was discussed that additional mitigation actions would be examined during the update process. The mitigation actions that were discussed were what the Wallingford Planning Committee wanted to have included in the hazard mitigation plan.

Plan Maintenance

Plan maintenance involves taking action to ensure that the plan stays current with information, priorities are still in order, and goals and objectives are maintained and updated. To accomplish this, the plan will be reviewed by the planning team annually and be incorporated into other city plans. Additionally, a comprehensive update is required at least once every 5 years and submitted to FEMA for certification. The

9.8 School District

Planning Committee Members:

Delaine Hiney - Executive Director Facilities Management
Terry Reekers – Emergency Management
Jeff Soper – Finance

Board of Education

Jan Lund
Pat Kibbie
Arden Kinnander
Dave Gottsche
Jane Nolan Goeken
Mike Prior
Bob Jennings

School Contact and number:

Delaine Hiney - 712.362.0428

Plans and Mechanisms

The college has an emergency response plan that is distributed to all employees and available on our S drive.

Critical Facilities for School District

School Facility	Address	Value of building	Max # people that would be at the facility
Iowa Lakes Community College – Estherville Campus	300 S 18 th St Estherville, IA	\$5,256,400	1,000

Hazard Risk Assessment

The ILCC Hazard Mitigation Planning Committee determined the countywide hazard rankings. The school was also provided with information and statistics relevant to hazards affecting ILCC, including records of past events and damages. The school was asked to review the information from the countywide rankings and determine if highest risk hazards for the county applied to ILCC, and if not, how ILCC's situation differs from the county. Based on this discussion, prevalent hazards were determined for ILCC. Along with the information and statistics provided, the people present were asked to draw upon their knowledge and experiences of hazards affecting ILCC. After the discussion among the planning team, it was decided that the ILCC would re-prioritize the hazards of the countywide ranking for their jurisdictional portion of the plan. The ILCC eliminated many of the hazards that were in the countywide ranking, such as: grass and wildland fire, river flood, flash flood, levee failure, landslide, and dam failure. The planning team decided that those hazards did not apply to ILCC.

It is recognized that ILCC may be susceptible to other hazards, such as the other hazards in the State of Iowa Hazard Mitigation Plan, but those hazards are not considered to be a high risk and are not examined at this

time. However, if it is later determined that a hazard affecting ILCC does pose a higher risk than originally determined, it will be examined at that time or when the plan is updated.

Iowa Lakes Community College	
1	Severe Winter Storm
2	Windstorm
3	Hailstorm
4	Extreme Heat
5	Thunderstorm and Lightning
6	Tornado
7	Drought

Source: Emmet County Planning Committee

**This hazard scoring, which was completed by the Emmet County Hazard Mitigation Planning Team, was used for all jurisdictions in Emmet County. The hazard ranking comprised from the scoring was given to each jurisdiction and the jurisdictions identified which hazards could impact them and re-ranked the hazards according to their historical knowledge of their community.*

Identified Mitigation Actions

- Back up Power Generators (buy)
- Tornado Safe Room (build)
- Outdoor Warning Sirens (build or update)

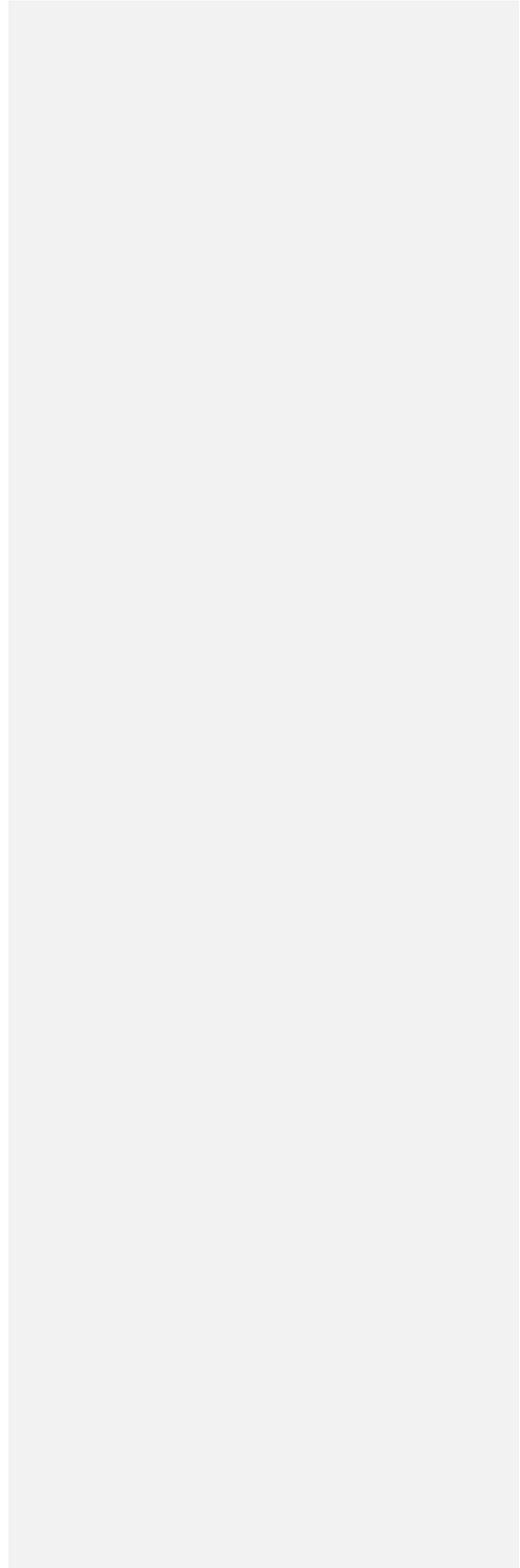
The ILCC Planning Team and Emmet County are responsible for overseeing the implementation of this plan. Emmet County Emergency Management and other county and local agencies will assist with implementing and administering this plan. The mitigations actions were discussed with a high, medium and low priority ranking in mind. **High (H)** – Jurisdictions valued this as something that had the highest effect on helping the community and people survive severe weather events. Also the cost could be easily obtained or funding has already been set aside. **Medium (M)** – These were valued at the jurisdictions as projects that where ranked in between the other two priority groups. **Low (L)** – These mitigation actions have the least effect on protecting human life from severe weather events and therefore have been given the lowest priority. Or the cost is too high at this point in time and makes it unlikely to be acted upon in present future. Priorities for each mitigation action are discussed in the Mitigation Actions, Section 6. Another factor in the implementation of the mitigation actions was their benefit versus how much the project would cost. Economics of implementing mitigation actions were considered when the planning team discussed the priority of projects. Cost estimates were given by the Emmet County Planning Committee to help display which actions were of a higher importance and fit in the economic goals of the county/cities/schools. Those estimates can be reference in Section 6. The Implementation Schedule for the mitigation activities, whether ongoing or considered, will be subject to the availability of Federal, State, and local funding. Continuing (ON) = Ongoing (responsible entity regularly participates in or supports); Short Term (ST) = 1-5 years to initiate or accomplish; and Long Term (LT) = 5 or more years to initiate or accomplish.

Once the plan is completed, approved, and adopted, local governments will be eligible for funding assistance from FEMA for mitigation strategies put forth in the plan. Potential funding resources include the FEMA Pre-Disaster Mitigation Program (PDM) and FEMA Hazard Mitigation Grant Program (HMGP). No timeframe was identified in implementing these mitigation actions will be acted upon as funding become available. It was discussed that additional mitigation actions would be examined during the update process. The mitigation actions that were discussed were what the ILCC Planning Committee wanted to have included in the hazard mitigation plan.

Plan Maintenance

Plan maintenance involves taking action to ensure that the plan stays current with information, priorities are still in order, and goals and objectives are maintained and updated. To accomplish this, the plan will be reviewed by the planning team annually and be incorporated into other school plans. Additionally, a comprehensive update is required at least once every 5 years and submitted to FEMA for certification. The revised plan will be adopted by the board. To assist with the update, information is to be collected by the

Appendix



Appendix –Section Changes-Plan Update

Those communities that did have previous Hazard Mitigation Plan were reviewed by the respective planning committees. The major updates and the process in which the plan was reviewed and analyzed are noted in the following tables below.

City of Armstrong

Section (Below are Examples-Use headings from plan)	Updates	Comments:
Purpose and Planning Process	No	
Community Background, Profile, Services/Facilities	Yes	New information was obtained and put into the plan.
Hazard Analysis/Risk Assessment	Yes	Focused plan on 16 natural hazards. Different scoring methods.
Hazard and Activities Prioritization	Yes	Hazard rankings were based off of the County's ratings.
Hazard Vulnerability Assessment	Yes	More information was supplied, numbers of structures and values.
Mitigation Activities	Yes	Some were removed/ongoing/completed/added.

City of Dolliver

Section (Below are Examples-Use headings from plan)	Updates	Comments:
Purpose and Planning Process	No	
Community Background, Profile, Services/Facilities	Yes	New information was obtained and put into the plan.
Hazard Analysis/Risk Assessment	Yes	Focused plan on 16 natural hazards. Different scoring methods.
Hazard and Activities Prioritization	Yes	Hazard rankings were based off of the County's ratings.
Hazard Vulnerability Assessment	Yes	More information was supplied, numbers of structures and values.
Mitigation Activities	Yes	Some were removed/ongoing/completed/added.

City of Estherville

Section (Below are Examples-Use headings from plan)	Updates	Comments:
Purpose and Planning Process	No	
Community Background, Profile, Services/Facilities	Yes	New information was obtained and put into the plan.
Hazard Analysis/Risk Assessment	Yes	Focused plan on 16 natural hazards. Different scoring methods.
Hazard and Activities Prioritization	Yes	Hazard rankings were based off of the County's ratings.
Hazard Vulnerability Assessment	Yes	More information was supplied, numbers of structures and values.
Mitigation Activities	Yes	Some were deferred/completed/ongoing/added.

City of Gruver

Section (Below are Examples-Use headings from plan)	Updates	Comments:
Purpose and Planning Process	No	
Community Background, Profile, Services/Facilities	Yes	New information was obtained and put into the plan.
Hazard Analysis/Risk Assessment	Yes	Focused plan on 16 natural hazards. Different scoring methods.
Hazard and Activities Prioritization	Yes	Hazard rankings were based off of the County's ratings.
Hazard Vulnerability Assessment	Yes	More information was supplied, numbers of structures and values.
Mitigation Activities	Yes	Some were deleted/ongoing/added.

City of Ringsted

Section (Below are Examples-Use headings from plan)	Updates	Comments:
Purpose and Planning Process	No	
Community Background, Profile, Services/Facilities	Yes	New information was obtained and put into the plan.
Hazard Analysis/Risk Assessment	Yes	Focused plan on 16 natural hazards. Different scoring methods.
Hazard and Activities Prioritization	Yes	Hazard rankings were based off of the County's ratings.
Hazard Vulnerability Assessment	Yes	More information was supplied, numbers of structures and values.
Mitigation Activities	Yes	Some were ongoing/added.

City of Wallingford

Section (Below are Examples-Use headings from plan)	Updates	Comments:
Purpose and Planning Process	No	
Community Background, Profile, Services/Facilities	Yes	New information was obtained and put into the plan.
Hazard Analysis/Risk Assessment	Yes	Focused plan on 16 natural hazards. Different scoring methods.
Hazard and Activities Prioritization	Yes	Hazard rankings were based off of the County's ratings.
Hazard Vulnerability Assessment	Yes	More information was supplied, numbers of structures and values.
Mitigation Activities	Yes	Some were deleted/ongoing/added.

Iowa Lakes Community College – No Previous Plan

APPENDIX – Previous Plan Mitigation Actions

Armstrong

HAZARD MITIGATION PLAN UPDATE MITIGATION ALTERNATIVES STATUS

Mitigation Goals and Alternatives	Status (ongoing, completed, deleted or deferred)	Comments:
1. Natural Weather Occurrences		▪
1.1 Diminish the impact of severe weather on property and the public		▪
1.1.1 Continue purchasing an outdoor warning siren	Completed	▪
1.1.2 Educate the public on severe weather preparedness	Ongoing	▪
1.1.3 Continued maintenance and improvements to the outdoor warning sirens	Ongoing	▪
1.1.4 Consider replacing substandard sewer lines	Ongoing	▪
1.1.5 Continue to promote the storm spotter training program	Ongoing	▪
1.1.6 Review the local Emergency Operations Plan on an annual basis	Ongoing	▪ Terry Reekers
1.1.7 Continue regular maintenance check on back-up generators	Ongoing	▪ Stateline Generator
1.1.8 Review Mutual-Aid agreement for shared fire services throughout the County as needed	Ongoing	▪ Martin and Kossuth Counties
1.1.9 Consider constructing a continuous water system loop throughout the city	Ongoing	▪
1.1.10 Educate residents about the NOAA Weather Radios	Ongoing	▪ Terry Reekers
1.1.11 Educate public on terrorism awareness	Deleted	▪
2. Hazardous Materials		▪
2.1 Reduce the Impact of a Hazardous release incident		▪
2.1.1 Continue to promote hazmat training by public safety officials	Ongoing	▪
2.1.2 Continue involvement with the Mason City Hazmat Team	Ongoing	▪

Dolliver

HAZARD MITIGATION PLAN UPDATE MITIGATION ALTERNATIVES STATUS

Mitigation Goals and Alternatives	Status (ongoing, completed, deleted or deferred)	Comments:
1. Natural Weather Occurrences		▪
1.1 Diminish the impact of severe weather on property and the public		▪
1.1.1 Pursue ways of obtaining NOAA Weather Radios	Ongoing	▪
1.1.2 Continue tree trimming	Ongoing	▪
1.1.3 Continue contract with Emmet County for snow removal	Ongoing	▪
1.1.4 Continue routine checks on LP tanks		▪ NuWay
1.1.5 Educate public on severe weather preparedness	Ongoing	▪
1.1.6 Educate public on terrorism awareness	Deleted	▪
1.1.7 Consider purchasing an outdoor warning siren	Ongoing	▪
1.1.8 Consider purchasing a back-up generator for the city well	Completed	▪ 2008
1.1.9 Educate residents about NOAA Weather Radios	Ongoing	▪
1.1.10 Continue contract with Gruver's fire department	Ongoing	▪
2. Hazardous Materials		▪
2.1 Reduce the Impact of a Hazardous release incident		▪
2.1.1 Continue support of the Mason City Hazmat Team	Ongoing	▪

HAZARD MITIGATION PLAN UPDATE MITIGATION ALTERNATIVES STATUS

Mitigation Goals and Alternatives	Status (ongoing, completed, deleted or deferred)	Comments:
1. Natural Weather Occurrences		▪
1.1 Diminish the impact of severe weather on property and the public		▪
1.1.1 Continue maintenance and improvements to the city’s storm sewer and municipal infrastructure systems	Ongoing	▪
1.1.2 Continue educating the public and schools on severe weather preparedness	Ongoing	▪
1.1.3 Pursue ways of obtaining additional NOAA Weather Radios, especially for identified critical facilities within the community	Ongoing	▪
1.1.4 Check the condition and coverage of the city’s outdoor warning sirens	Ongoing	▪
1.1.5 Continue the policy to test the outdoor warning sirens on the 1 st Saturday of each month	Ongoing	▪
1.1.6 Continue to support mutual-aid efforts of both law enforcement and fire protection services for Estherville	Ongoing	▪
1.1.7 Promote and support the storm spotter training program and recruit new or additional storm spotters	Ongoing	▪
1.1.8 Designate and educate the public on location of specific severe storm shelters within the community	Ongoing	▪
1.1.9 Continue to bury electrical and other utility lines within the community	Ongoing	▪
1.1.10 Educate the public and local businesses, and enforce the no parking ordinance during snow	Ongoing	▪

removal operations		
1.1.11 Continue snow fence installation to reduce drifting along primary roadways	Deferred	▪ County
2. Hazardous Materials		▪
2.1 Reduce the Impact of a Hazardous release incident		▪
2.1.1 Continue to promote Hazmat training by the volunteer fire department and other public safety officials	Ongoing	▪
2.1.2 Continue involvement with and support of the Mason City Hazmat Team	Ongoing	▪
2.1.3 Support and encourage Tier II reporting to the local County Emergency Management	Ongoing	▪
3.1 Utilize planning tools and documents to consider, address, educate or enforce hazard mitigation measures		▪
3.1.1 Maintain, enforce, and update zoning ordinance	Ongoing	▪
3.1.2 Continue to update and follow the local Emergency Operations Plan	Ongoing	▪
3.1.3 Continue the City's tree-trimming ordinance, requiring a minimum 10' height	Ongoing	▪
3.1.4 Discourage development in flood prone areas of the community	Ongoing	▪
3.1.5 Encourage FEMA to update floodplain maps for the community and continue the city's membership with the NFIP	Ongoing	▪
3.1.6 Continue with an equipment replacement program as part of the city's CIP. The City has identified a need for a ladder fire truck	Ongoing	▪
3.1.7 The Fire Department's highest priority is to replace its tanker truck within a year or two	Completed	▪ 1984 was replace 3 years ago

HAZARD MITIGATION PLAN UPDATE MITIGATION ALTERNATIVES STATUS

Mitigation Goals and Alternatives	Status (ongoing, completed, deleted or deferred)	Comments:
1. Natural Weather Occurrences		▪
1.1 Diminish the impact of severe weather on property and the public		▪
1.1.1 Continue educating public on severe weather preparedness	Ongoing	▪
1.1.2 Maintain surge protector equipment on critical municipal electronic equipment	Deleted	▪
1.1.3 Work with the utility provider on maintenance of lines and poles, or buying lines	Ongoing	▪
1.1.4 Consider pursuing funding to purchase a backup generator for the new sewer system, along with a new backup generator for electricity	Complete	▪ 2005
1.1.5 Consider marking fire hydrants for easier location, especially during winter months	Ongoing	▪
1.1.6 Pursue ways of obtaining NOAA Weather Radios	Ongoing	▪
1.1.7 Continue to promote, recruit and train volunteers for the storm spotter training program	Ongoing	▪
1.1.8 Pursue funding alternatives to purchase and implement and outdoor early warning siren for the community	Ongoing	▪
1.1.9 The City needs to work with the local utility company to encourage tree trimming, replace aging and unsafe utility poles and liens, and encourage energy conservation and education	Ongoing	▪
1.1.10 Consider purchasing or assisting homeowners with obtaining sump pumps in order to mitigate against basement	Ongoing	▪

flooding during flash flood events		
1.1.11 Create and maintain a municipal Emergency Response Plan for Gruver		<ul style="list-style-type: none"> ▪ Update with Terry Reekers
1.1.12 Implement burning bans when necessary	Ongoing	<ul style="list-style-type: none"> ▪

Mitigation Goals and Alternatives	Status (ongoing, completed, deleted or deferred)	Comments:
2. Hazardous Materials		<ul style="list-style-type: none"> ▪
2.1 Reduce the Impact of a Hazardous release incident		<ul style="list-style-type: none"> ▪
2.1.1 Ensure that the Fire Department continues its training to recognize and able to respond to HAZMAT events	Ongoing	<ul style="list-style-type: none"> ▪
2.2 Support the education and training required to prevent future man-made hazards		<ul style="list-style-type: none"> ▪
2.2.1 Purchase new and continue to operate mobile 2-way radios for response personnel communications	Completed	<ul style="list-style-type: none"> ▪ 2012
2.2.2 Pursue ways of funding and maintaining safe and operating fire protection equipment	Ongoing	<ul style="list-style-type: none"> ▪
2.2.3 Continue and support mutual-aid agreements with the fire department and law enforcement services	Ongoing	<ul style="list-style-type: none"> ▪

HAZARD MITIGATION PLAN UPDATE MITIGATION ALTERNATIVES STATUS

Mitigation Goals and Alternatives	Status (ongoing, completed, deleted or deferred)	Comments:
1. Natural Weather Occurrences		▪
1.1 Diminish the impact of severe weather on property and the public		▪
1.1.1 Pursue outside funding to purchase NOAA Weather Radios	Ongoing	▪
1.1.2 Educate the public on severe weather preparedness	Ongoing	▪
1.1.3 Conduct regular checks and maintenance to the outdoor warning siren	Ongoing	▪
1.1.4 Consider purchasing a generator	Ongoing	▪
1.1.5 Continue to promote the storm spotter training program	Ongoing	▪
1.1.6 Develop a local Emergency Operations Plan	Ongoing	▪
1.1.7 Continue to put up snow fencing	Ongoing	▪
1.1.8 Review Iowa Mutual-Aid Compact agreement for shared fire services	Ongoing	▪
1.1.9 Evaluate communication capabilities between all public safety departments	Ongoing	▪
1.1.10 Educate residents about the NOAA Weather Radios	Ongoing	▪
2. Hazardous Materials		▪
2.1 Reduce the Impact of a Hazardous release incident		▪
2.1.1 Continue to promote hazmat training by public safety officials	Ongoing	▪
2.1.2 Continue involvement with the Mason City Hazmat Team	Ongoing	▪

Wallingford

HAZARD MITIGATION PLAN UPDATE MITIGATION ALTERNATIVES STATUS

Mitigation Goals and Alternatives	Status (ongoing, completed, deleted or deferred)	Comments:
1. Natural Weather Occurrences		▪
1.1 Diminish the impact of severe weather on property and the public		▪
1.1.1 Continue the support of the Iowa Mutual-Aid Compact	Ongoing	▪
1.1.2 Pursue ways of obtaining NOAA Weather Radios	Ongoing	▪
1.1.3 Consider purchasing an outdoor warning siren	Ongoing	▪
1.1.4 Evaluate communication capabilities between all public safety departments	Ongoing	▪
1.1.5 Consider installing rail-crossing guards at the intersection of St James Ave	Complete	▪ 2013
1.1.6 Educate the public on severe weather preparedness	Ongoing	▪
1.1.7 Seek alternative funding sources to purchase a generator for community center	Ongoing	▪
1.1.8 Review and update Standard Operating Procedures (SOP) annually	Ongoing	▪
1.1.9 Develop an Emergency Operations Plan for the community	Ongoing	▪
1.1.10 Consider purchasing a fire truck (pumper) and gear	Complete	▪ 2005
1.1.11 Educate residents on terrorism awareness	Deleted	▪
1.1.12 Pursue funding for portable pumps	Ongoing	▪
1.1.13 Continued participation in the NFIP	Ongoing	▪

Mitigation Goals and Alternatives	Status (ongoing, completed, deleted or deferred)	Comments:
2. Hazardous Materials		▪
2.1 Reduce the Impact of a Hazardous release incident		▪
2.1.1 Continue to promote hazmat training by public safety officials	Ongoing	▪
2.1.2 Continue involvement with the Mason City Hazmat Team	Ongoing	▪
2.1.3 Consider purchasing a decontamination tent for hazmat incidents	Deleted	▪