

Pre-Disaster Mitigation Plan

SIX COUNTY ASSOCIATION OF GOVERNMENTS
JUAB, MILLARD, PIUTE, SANPETE, SEVIER, WAYNE

PREPARED BY: SIX COUNTY PLANNING AND COMMUNITY
DEVELOPMENT

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Contents

Executive Summary	4
Plan Mission.....	4
Plan Organization.....	4
Plan Financing	4
Plan Participation.....	4
Juab County	4
Millard County.....	5
Piute County.....	5
Sanpete County	5
Sevier County.....	5
Wayne County	5
Hazards Identified.....	5
PRE-REQUISITES & ADOPTION BY THE LOCAL JURISDICTIONS.....	5
Preface.....	5
Introduction.....	6
SCAOG Participating Jurisdictions	7
Scope.....	8
Goals	8
Overall Goals:	8
Short Term Goals.....	8
Long Term Goals	9
Objectives	9
Authority	10
Federal:	10
State:	10
Six County Association of Governments:.....	10
Local:	10
Acknowledgements.....	11
PLANNING PROCESS.....	12
SCAOG PDM Planning Process.....	12
Step 1: Organize Resources	12
Step 2: Public Officials Outreach	14
Step 3: Establish Continuity in the Planning Process	17
Step 4: Data Acquisition	17
Step 5: Hazard Risk Identification and Analysis	17
Step 6: County Vulnerability Assessment	18
Step 7: Community Goals Assessment.....	18
Step 8: Contact Regional Mitigation Emergency Managers.....	18
Step 9: Mitigation Strategy Development.....	18
Step 10: Prioritization of Identified Mitigation Strategies.....	21
Step 11: State Review	21
Step 12: Adoption	21
Public Involvement	21
Information Sources.....	22
Plan Methodology.....	23

State and federal guidelines and requirements for mitigation plans:	23
Previous plans and studies:	23
Risk Assessment	23
GENERAL REGIONAL DATA	27
Juab County	27
Millard County	27
Piute County.....	27
Sanpete County	27
Sevier County.....	27
Wayne County	27
Demographics	27
Geographic and Physiographic Background.....	30
Physiography.....	31
Climate & Geology.....	32
Climate.....	32
Geology.....	33
National Flood Insurance Program Participation.....	34
About Participation	34
Building Code Effectiveness Grading BCEGS Scores:.....	36
Hazard Definitions	36
Flood	36
Earthquake	37
Landslides	39
Severe Weather	39
Drought	40
Tornados and High Winds	41
Dam Failure	41
Plan Maintenance Procedures	42
Monitoring, Evaluating and Updating the Plan	42
Annual Reporting Procedures	42
Revisions and Updates.....	42
Five (5) Year Plan Review.....	42
Plan Amendments	43
Implementation through Existing Programs	44
Process	44
Funding Sources.....	44
Federal.....	44
State Programs	47
Local	48
Non-Governmental	48
Continued Public Involvement	48
Six County Regional Risk Assessment.....	51
Drought in the Six County Region.....	51
History of Drought in Six County Region	51
Drought Assessment for the Six County Region	51
Severe Weather in the Six County Region	52

History of Severe Weather in Six County Region..... 52

Executive Summary

Plan Mission

The mission of the Six County Association of Governments (SCAOG) Pre-Disaster Mitigation Plan update is to substantially and permanently reduce vulnerability to natural hazards for the communities within the SCAOG. 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.

Plan Organization

The Six County Association of Governments plan was developed and organized within the rules and regulations established in 44 CRF 201.6. The plan contains a discussion on the purpose and methodology used to develop the plan, a profile on communities within SCAOG, as well as a hazard identification study and a vulnerability analysis of five hazards. The explanation of the above-identified contents is contained in the sections which provide more detail on specific communities. This is intended to improve the ability of the counties and communities within the SCAOG planning district to handle disasters and document valuable local knowledge on the most efficient and effective ways to reduce loss.

Plan Financing

The SCAOG Pre-Disaster Mitigation Plan has been financed and developed under the Pre-Disaster Mitigation Program provided by the Federal Emergency Management Agency (FEMA) and the AOG aided in funding, providing in-kind assistance to local governments.

Plan Participation

The SCAOG Pre-Disaster Mitigation Plan has been completed as a result of a collaborative effort between Six County Association of Governments, Utah Division of Emergency Management, public agencies, and the citizens, elected officials, and public employees of the cities and towns within Juab, Millard, Piute, Sanpete, Sevier, and Wayne Counties. Interviews were conducted with stakeholders from the communities, and a workshop was conducted during the plan developments. Public hearings, workshops, and draft plans were provided for public participation. Any comments, questions, and discussions resulting from these activities were given consideration in the development of this plan. Completion of this multi-jurisdiction mitigation plan was completed with assistance from the communities. The following communities offered mitigation strategies for this plan.

Juab County

Emergency Manager, Town of Mona, Nephi City, and Rocky Ridge.

Millard County

Emergency Manager, Delta City, Town of Hinckley, Town of Holden, Town of Kanosh, Town of Leamington, and Town of Lynndyl.

Piute County

Emergency Manager, Town of Circleville, and Town of Marysvale.

Sanpete County

Emergency Manager, Town of Centerfield, Ephraim City, Fountain Green City, Gunnison City, Manti City, and Spring City.

Sevier County

Emergency Manager, Town of Central Valley, and Town of Redmond.

Wayne County

Emergency Manager, Town of Bicknell, Town of Hanksville, Town of Loa, and Town of Torrey.

Hazards Identified

The plan addresses the following hazards per county: flooding, wildfires, landslides, earthquakes, and dam failure. Severe weather and drought are addressed regionally.

The hazard identification study recognized the following hazards as being the most prevalent and posing the most potential risk to the counties and towns within the SCAOG planning district.

- Earthquake, Flood, Drought, Wildfire, and Severe Weather.

PRE-REQUISTES & ADOPTION BY THE LOCAL JURISDICTIONS

The Six County Executive Board, as well as the counties and communities participated in and promulgated this plan.

Preface

The Six County Association of Governments (SCAOG) in 1970 received official designation as a planning district. Its geographic service delivery area of Central Utah comprises Juab, Millard, Piute, Sanpete, Sevier, and Wayne Counties. This organization is required to establish and implement all future planning endeavors to benefit its citizenry. Economies of scale provide a pragmatic regional methodology and effective utilization of limited resources.

In accordance to the Six County Executive Board's governance all pertinent (natural hazard mitigation) planning groups were contacted by the SCAOG planning staff. These groups included elected officials and special interest representation for units of local government, i.e., emergency managers, law enforcement officers, etc. Their input was essential in the development of the SCAOG Pre-Disaster Mitigation Plan and recommended for adoption by the Six County Association of Governments.

Introduction

The State of Utah is vulnerable to natural, technological, and man-made hazards that have the possibility of causing serious threat to the health, welfare, and security of our citizens. The cost of response to and recovery from potential disasters can be lessened when attention is turned to mitigating their impacts and effects before they occur or re-occur.

What is Hazard Mitigation? Hazard mitigation is defined as any cost-effective action(s) that have the effect of reducing, limiting, or preventing vulnerability of people, property, and the environment to potentially damaging, harmful, or costly hazards. Hazard mitigation measures, which can be used to eliminate or minimize the risk to life and property, fall into three categories. The first categories are those that keep the hazard away from people, property, and structures. The second categories are those that keep people, property, and structures away from the hazard. The third categories are those that do not address the hazard at all, but rather reduce the impact of the hazard on the victims, such as insurance. This mitigation plan has strategies that fall into all three categories.

Hazard mitigation measures must be practical, cost effective, and environmentally and politically acceptable. Actions taken to limit the vulnerability of society to hazards must not in themselves be more costly than the value of anticipated damages.

The primary focus of hazard mitigation actions must be at the point at which capital investment decisions are made and based on vulnerability. Capital investments, whether for homes, roads public utilities, pipelines, power plants, chemical plants or warehouses, or public works, determine to a large extent the nature and degree of hazard vulnerability of a community. Once a capital facility is in place, very few opportunities will present themselves over the useful life of the facility to correct any errors in location or construction with respect to hazard vulnerability. It is for these reasons that zoning ordinances, which restrict development in high vulnerability areas, and building codes, which insure that new buildings are built to withstand the damaging forces of hazards, are the most useful mitigation approaches a city can implement.

Previously, mitigation measures have been the most neglected programs within emergency management. Since the priority to implement mitigation activities is generally low in comparison to the perceived threat, some important mitigation measures take time to implement. Mitigation success can be achieved, however, if accurate information is portrayed through complete hazard identification and impact studies, followed by effective mitigation management. Hazard mitigation is the key to eliminating long-term risk to people and property living in Utah from hazards and their effects. Preparedness for all hazards includes response and recovery plans, training, development, management of resources, and the need to mitigate each jurisdictional hazard.

This regional/multi-jurisdictional plan evaluates the impacts, risks and vulnerabilities of natural hazards in a jurisdictional area affected by a disaster. The plan supports, provides assistance, identifies and describes mitigation projects for each section. The suggestive actions and plan implementation for local and tribal governments could reduce the impact of future disasters. Only through the coordinated partnership with emergency managers, political entities, public

works officials, community planners and other dedicated individuals working to implement this program was it accomplished.

The update of the PDM is completed through the planning services of Associations of Governments of Utah.

Seven regional Associations of Governments:

1. Bear River Association of Governments
2. Wasatch Front Association of Governments / Wasatch Front Regional Council
3. Mountainland Association of Governments
4. Six County Association of Governments
5. Southeast Utah Association of Local Governments
6. Southwestern / Five County Association of Governments
7. Uintah Basin Association of Governments

SCAOG Participating Jurisdictions

Juab County

Eureka City, Town of Levan, Town of Mona, Nephi City, and Town of Rocky Ridge.

Millard County

Delta City, Fillmore City, Town of Hinckley, Town of Holden, Town of Kanosh, Town of Leamington, Town of Lynndyl, Town of Meadow, Town of Oak City, and Town of Scipio.

Piute County

Town of Circleville, Town of Junction, Town of Kingston, and Town of Marysvale.

Sanpete County

Town of Centerfield, Ephraim City, Fairview City, Town of Fayette, Fountain Green City, Gunnison City, Manti City, Town of Mayfield, Moroni City, Mt. Pleasant City, Spring City, Town of Sterling, and Town of Wales.

Sevier County

Town of Annabella, Aurora City, Town of Central Valley, Town of Elsinore, Town of Glenwood, Town of Joseph, Town of Koosharem, Monroe City, Town of Redmond, Richfield City, Salina City, and Town of Sigurd.

Wayne County

Town of Bicknell, Town of Hanksville, Town of Loa, Town of Lyman, and Town of Torrey.

The purpose of the Six County Association of Government Natural Hazard Mitigation Plan is to fulfill federal, state, and local hazard mitigation planning responsibilities; to promote pre and post disaster mitigation measures, short/long range strategies that minimize suffering, loss of life, and damage to property resulting from hazardous or potentially hazardous conditions to which citizens and institutions within the state are exposed; and to eliminate or minimize conditions which would have an undesirable impact on our citizens, the economy, environment, and the well-being of the state of Utah. This plan is to aid in enhancing city and state officials, agencies, and public awareness to the threat hazards pose to property and life and what can be done to help prevent or reduce the vulnerability and risk to jurisdiction with in the Six County planning area.

Scope

Six County Association of Governments, which encompasses much of Central Utah, including the counties of Juab, Millard, Piute, Sanpete, Sevier, and Wayne, was placed under contract by the Utah Division of Emergency Management to complete a Pre-Disaster Mitigation Plan, which meets the requirements of the Disaster Mitigation Act of 2000, for the areas they serve.

This plan is applicable not only to the six counties served by SCAOG but also for the cities, towns, and municipalities within each county. The scope of this plan includes natural hazards defined as a concern to local counties and jurisdictions. These natural hazards identified by stake holders include: earthquakes, floods, landslides, wildfires, problem soils, dam failures, severe weather, and drought. Although there were the only hazards considered much of the data is applicable to other federally funded planning currently taking place. Planning included local level data for each incorporated area within the six counties.

Goals

Overall Goals:

To coordinate with each participating local government to develop a regional planning process meeting each plan component identified in the FEMA Region VIII Mitigation Plan Review Tool document and any additional State planning expectation, both regionally and specifically, as needed, by gathering local input, AND to reduce risk from natural hazards in Central Utah, through the implementation and updating of regional plans. No priorities have changed since the plan was previously approved. The information from the previous plan is validated.

Short Term Goals

These goals form the basis for the development of the PDM Plan and are shown from highest priority, at the top of the list, to those of lesser importance nearer the bottom.

- Protection of life before, during, and after the occurrence of a disaster.
- Preventing loss of life and reducing the impact of damage where problems cannot be eliminated.
- Protection of emergency response capabilities (critical infrastructure)
- Improvement of communication and warning systems
- Improvement of emergency medical services and medical facilities
- Improvement of mobile resources
- Protection of critical facilities
- Government continuity maintained during disaster
- Protection of developed property, homes and businesses, industry, education opportunities and the cultural fabric of a community, by combining hazard loss reduction with the community's environmental, social and economic needs.
- Protection of natural resources and the environment, when considering mitigation measures.
- Promotion of public awareness through education of community hazards and mitigation measures.
- Preserving and/or restoring natural features that provide mitigation such as floodplains.

Long Term Goals

- Elimination or reduction of the long-term risk to human life and property from identified natural and technologic hazards.
- Aid in both the private and public sectors in understanding the risks they may be exposed to and finding mitigation strategies to reduce those risks.
- Avoid risk of exposure to identified hazards.
- Minimization of the impacts of those risks when they cannot be avoided
- Mitigation of the impacts of damage as a result of identified hazards.
- Accomplish mitigation strategies in such a way that negative environmental impacts are minimized.
- Provide a basis for funding of projects outlined as hazard mitigation strategies.
- Establish a regional platform to enable the community to take advantage of shared goals, resources, and the availability of outside resources. If an earthquake occurs outside of the county seat it will still affect the county seat. This is similar to many natural hazards.
- Establish a framework and database for the county seat to use to apply for aid.

Objectives

The following objectives are meant to serve as a measure upon which individual hazard mitigation projects can be evaluated. These criteria become especially important when two or more projects are competing for limited resources.

- Identification of persons, agency or organization responsible for implementation.
- Projecting a time frame for implementation.
- Explanation of how the project will be financed including the conditions for financing and implementing as information is available.
- Identifying alternative measures, should financing not be available.
- Be consistent with, support, and help implement the goals and objectives or hazard mitigation plans already in place for surrounding counties.
- Have significant potential to reduce damages to public and/or private property and/or reduce the cost of, state, and federal recovery for future disasters.
- Be the most practical, cost-effective, and environmentally sound alternative after consideration of the options.
- Address a repetitive problem, or one that has the potential to have a major impact on an area, reducing the potential for loss of life, loss of essential services and personal.
- Property, damage to critical facilities, economic loss, and hardship or human suffering.
- Meet applicable permit requirements.
- Not encourage development in hazardous areas.
- Assuring the benefits of a mitigation measure is equal to or exceeds the cost of implementation.
- Have manageable maintenance and modification costs.
- When possible, be designed to accomplish multiple objectives including improvement of life-safety risk, damage reduction, restoration of essential services, protection or critical facilities, security or economic development, recovery, and environmental enhancement.
- Whenever possible, use existing resources, agencies and programs to implement the project.

Authority

Federal:

Public Law 93-288 as amended, established the basis for federal hazard mitigation activity in 1974. A section of this Act requires the identification, evaluation, and mitigation of hazards as a prerequisite for state receipt of future disaster assistance outlays. Since 1974, many additional programs, regulations, and laws have expanded on the original legislation to establish hazard mitigation as a priority at all levels of government. When PL 93-288 was amended by the Stafford Act, several additional provisions were also added that provide for the availability of significant mitigation measures in the aftermath of Presidential declared disasters. Civil Preparedness Guide 1-3, Chapter 6- Hazard Mitigation Assistance Programs places emphasis on hazard mitigation planning directed toward hazards with a high impact and threat potential.

President Clinton signed the Disaster Mitigation Act of 2000 into Law on October 30, 2000. Section 322, defines mitigation planning requirements for state, local, and tribal governments. Under Section 322 States are eligible for an increase in the Federal share of hazard mitigation (HMGP), if they submit for approval a mitigation plan, which is a summary of local and/or regional mitigation plans, that identifies natural hazards, risks, vulnerabilities, and describes actions to mitigate the hazards risks and vulnerabilities in that plan.

State:

- The Governor's Emergency Operation Directive
- The Robert T. Stafford Disaster Relief and Emergency Assistance Act, amendments to Public Law 93-288, as amended.
- Title 44, CFR, Federal Emergency Management Agency Regulations, as amended.
- State Emergency Management Act of 1981, Utah Code 53-2, 63-5.
- Disaster Response Recovery Act, 63-5A.
- Executive Order of the Governor, Executive Order 11
- Emergency Interim Succession Act, 63-5B.

Six County Association of Governments:

The Associations of Governments have been duly constituted under the authority of Title XI, Chapter 13, Utah Code Annotated, 1953, as amended (The Inter-local Cooperation Act) and pursuant to Section 3 of the Executive Order of the Governor of the State of Utah, dated May 27, 1970, with the authority to conduct planning studies and to provide services to its constituent jurisdictions.

Local:

Local governments play an essential role in implementing effective mitigation, both before and after disaster events. Each local government will review all damages, losses, and related impacts to determine the need or requirement for mitigation action and planning whenever seriously affected by a disaster, or when applying for state or federal recovery assistance. In the counties and cities making up the Six County Association of Governments the local executive responsible for carrying out plans and policies are the County Commissioners and City Mayors. Local governments must be prepared to participate in the post disaster Hazard Mitigation Team process and the pre-mitigation planning as outlined in this document.

Acknowledgements

Six County Association of Governments would like to extend their appreciation to the following agencies, which assisted in the development of this plan.

- Utah Division of Emergency Management
- Utah Geologic Survey
- Automated Geographic Reference Center
- United States Army Corps of Engineers
- Division of Water Rights Dam Safety Section
- Federal Emergency Management Agency Region VIII
- National Weather Service
- Utah Division of Forestry, Fire, and State Lands
- Councils of Governments (Tribal and local)
- Juab County Emergency Management
- Millard County Emergency Management
- Piute County Emergency Management
- Sanpete County Emergency Management
- Sevier County Emergency Management
- Wayne County Emergency Management
- Six County Mayors and Commissioners
- Six County Emergency Managers and city personnel
- Salt Lake City Emergency Management
- Utah Division of Water Resources

Plan Review, Evaluation, and Implementation

This document is an update to the 2003 Pre-Disaster Mitigation Plan. The plan was revised to reflect changes in development. This was done by interviewing participating jurisdictions and agencies. This process also provided information for the updates to reflect progress in local mitigation efforts. There has been no change in hazard mitigation priorities in the region, and the update stays true to the original focus.

PLANNING PROCESS

SCAOG PDM Planning Process

This plan was created through input gathered from the elected officials and hazard/emergency managers of the 49 jurisdictions and the six counties of the region. All were invited to participate. All communities were visited individually by a SCAOG planner.

This plan was prepared in the offices of the Six County Association of Governments by the appointed staff planners Todd Thorne, Chelsea Bakaitis and Emery Polelonema. Elected officials include, local officials, emergency managers, police and fire staff members, planning departments, and local governmental agencies have all aided in the planning and implementation process. The planning process was based on Section 322 requirements of the Disaster Mitigation Act of 2000 and supporting guidance documents developed by FEMA and the Utah Division of Emergency Management.

The lack of resources greatly hindered the creation of this plan. SCAOG Community and Economic Development is understaffed. The plan was accomplished primarily by the efforts of only one planner in these offices. SCAOG does not have a GIS specialist and so maps and in depth analysis for this plan are lacking.

There was also a turnover of the main project planner, Todd Thorne. There was a six month gap before Chelsea Bakaitis was hired to fill his position. Very little information about what had been done in the planning process and data was left from previous planner Todd Thorne's work. Ms. Bakaitis began the planning process for the PDM plan less than a year before the last extension. The lack of resources, data, capabilities, and deficiencies hindered the planning process.

The planning process included the following steps.

1. Organize Resources
2. Public Officials Out Reach
3. Establish Continuity in Planning Process
4. Data Acquisition
5. Hazard Risk Identification and Analysis
6. County Vulnerability Assessment
7. Community Goals Assessment
8. Contact Regional Mitigation Emergency Managers (County & Tribal)
9. Mitigation Strategy Development
10. Prioritization of Identified Mitigation Strategies
11. State Plan Review
12. Adoption

Step 1: Organize Resources

The seven regional Associations of Governments (AOG) were recommended to conduct the planning efforts by the Utah League of Cities and Towns and the Governor's Office of Planning and Budget to ensure coordination with elected officials, emergency managers, planners, public

works departments, and information technology specialists. Utah Division of Emergency Management contracted the seven AOGs as sub-grantees to coordinate, develop, and write the seven multi-regional hazard mitigation plans under the planning guidelines included in the Disaster Mitigation Act of 2000.

SCAOG contracted with by the Utah Division of Emergency Management to conduct the planning for the six-county region. The association worked closely with local jurisdictions to ensure their input, was incorporated into the plan.

SCAOG designated a core planning team made up of staff planners and the county Emergency Managers. Delegation of information was then delegated by the emergency manager at the local level.

Initial kick-off meetings were held in 2011 and 2012 by staff planner Todd Thorne, the regional planner at beginning of the planning process. The meetings were as listed:

- November 8, 2011- Sanpete County PDM Meeting
 - In attendance:
 - Todd Thorne, SCAOG
 - Regan Bolli, Ephraim City
 - Natasha Madsen, Manti City
 - William A Mickelson, Manti City
 - Steve Frischknecht, Sanpete County
 - Byron Davis, Wales Town
- May 23, 2012- Wayne County PDM Meeting
 - In Attendance:
 - Scott Brown, Chief Ranger, Capitol Reef National Park
 - Kassidee Brown, Wayne County EMS
 - Chris Chappell, Deputy, Wayne County Sheriff
 - Brandon Jensen, Wayne GIS, Wayne County GIS/ Road
- August 15 2012- Emergency Manager PDM Meeting
 - In attendance:
 - Brad Bartholomew, Utah DEM
 - Todd Thorne, SCAOG
 - Greg Peterson, Sanpete County EM
 - Mike Gayler, Piute County EM
 - Katie LeLaCheur, Utah DEM
 - Jeff Gallacher, Utah DEM
 - John Hunt, Sevier County EM
 - Emery Polelonema, SCAOG
- Unknown Date- Sevier County PDM Meeting
 - In Attendance:
 - Glen S. Chappell, Fishlake Forest Service
 - Curtis Bagley, Koosharem Town
 - Stan Andersen, Richfield BLM
 - Garon Sandall, Fishlake NF

- Jeff Gallacher, Utah DEM
- Brad Bartholomew, Utah DEM
- John Hunt, Sevier County DEM
- Unknown Date- Millard County PDM Meeting
 - In Attendance:
 - John Lovell, Fillmore CERT
 - Brad Bartholomew, Utah DEM

There was a change-over in staff at Six County in 2013. Staff planner, Chelsea Bakaitis was put in charge of the planning process. The County Commissioners were consulted during their public commission meetings to discuss the upcoming mitigation process:

- August 5, 2014: Millard County Commission
- August 18, 2014: Juab County Commission
- August 19, 2014: Sanpete County Commission
- September 8, 2014: Piute County Commission
- September 16, 2014: Wayne County Commission
- September 22, 2014: Sevier County Commission

Step 2: Public Officials Outreach

To ensure the planning process had backing from the elected officials a representative from Six County Association of Governments met with the county commissioners and city/town mayors in county and some community level assessment meetings. The communities and counties were asked to provide information about their capabilities, critical facilities, and hazard risk.

With the help of the County Emergency Managers, communities were invited to attend county-level meetings to discuss their natural hazards. This was part of the data gathering process for the assessment. Communities were explained the planning process and requested to return to their council members and fill out assessment worksheets in their public meetings. Emergency Managers discussed PDM with the communities which were not in attendance. The following is a list of the assessment meetings, and includes those in attendance.

- November 17, 2014: Sevier County Regional Assessment (Part of LEPC meetings)
 - In Attendance:
 - Peggy Smith, UHP
 - Stefan Long, Redmond
 - Mike Jorgenson, Joseph Town
 - Kent Houghton, Labor Commission
 - Mark Crane, EnviroCare
 - Bev Walden, Red Cross
 - Wayne Wetzel, BLM
 - Amber Koenig, FFSL
 - Justin Peterson, QuestarGas/Monroe FD
 - Steve Fehlhaber, Sevier Amateur Radio

- Bob Capt, Monroe 1st Ward
- Zac Kearney, Health Dept
- Brent Beach, UDOT
- Kirk Forbush, Div Water Rights
- Lee Freeman, Monroe 2nd Ward
- Terry Smith, UHSO
- Johnny Parsons, Monroe Fire Dept
- Chelsea Bakaitis, SCAOG
- Fran Washburn, Monroe City
- Tan Sithichai, Central Valley
- Judy Sithichai, Central Valley
- Lynette Warner, Glenwood Town
- Lynne Kellian, Red Cross
- Ray Ownes, Joseph Towh
- Wess Freeborn, USFS Fishlake
- Marv Turner, FFSL
- Devin Magleby, Monroe City
- Gary Reid, Monroe CERT
- Nate Selin, Health Dept
- Mark Rickenbach, Sevier Co Road Dept
- Gary Kyhl, Sevier School District
- Cynthia Nielsen, Sevier Co GIS
- Dan Curtis, Citizen
- Cody Barton, Sevier County EM
- Andy Rasmussen, Aurora Town
- November 19, 2014: Juab County Regional Assessment (Part of LEPC meetings)
 - In Attendance:
 - Fred Smalley, Juab County EM
 - Ron Steege, CUPHD
 - Zac Kearney, CUPHD
 - Tami Scott, CUMC
 - Wes Freeborn, USFS, Manti La-Sal
 - Marv Turner, FFSL
 - Casey Reynolds, Rocky Ridge Town
 - Kurtis Park, Nephi Fire
 - Robert Weston, UDOT
 - Kent Allred, Rocky Ridge Town
 - Nick Bowles, UHP
 - Larry Olsen, Holly Energy
 - Beth Hone, Levan Town
 - Chelsea Bakaitis, SCAOG
 - Randy McKnight, Nephi City
 - Terry Allred, Rocky Ridge Town

- Doug Anderson, Nephi City
 - Sara Samuelson, Mona City
 - Kylene Jones, Mona City
- December 2, 2014: Piute County Regional Assessment
 - In Attendance:
 - Diane Branham, Junction Town Council
 - Jeff Gallacher, Utah DEM
 - Bill Sudweeks, Kingston Town Mayor
 - Mike Haaland, Circleville Town Mayor
 - Mike Gayler, Piute County EM
 - Marty Gloave, Piute County Sherriff
- December 4, 2014: Millard County Regional Assessment (article inviting public to attend published in Millard County Chronicle Progress)
 - In Attendance:
 - Jason Salyer, Meadow CERT
 - Rosemary Salyer, Meadow CERT
 - Janet Lindquist, Oack City CERT
 - Susan Wilcox, Millard County Assessor Office
 - Eric Jenson, Fillmore City Council
 - Del Barnhurst, USDA FS District Ranger
 - Whil Whatcott, Holden Fire Chief
 - Wayne Jackson, Fillmore City Council
 - Forrest Roper, Millard County Sherriff Chief Deputy and EM
 - Teresa Carlson, Disaster Program Manager, Red Cross
 - Bev Waldon, Resilient Community Program, Red Cross
- December 16, 2014: Sanpete County Regional Assessment (Part of LEPC meetings)
 - In Attendance:
 - Sgt. Jayson Albee, Sanpete County EM
 - Scott Bartholomew, Sanpete County Commission
 - Kent Barton, Manti City Administrator
 - Barry Bradley, Sanpete County
 - Thayne Carlisle, UHP Section Lt.
 - Dan Camp, Utah Bureau of Health- EMS
 - Martin Duitz, Indianola Valley FD
 - Luke Freeman, Norbest/Moroni City
 - Jeff Gallacher, Utah DEM
 - Trent Halliday, Gunnison City PD
 - Jason Hatch, CUPHD
 - Keith Jensen, Wales City Mayor
 - Brett McCall, Centerfield PD
 - Graciela Torino Meyers, Indianola Valley FD
 - Tom Meyers, Hideaway Valley
 - Nathan Miner, START/HazMat

- Richard Moesley, State Fire Marshal
- Brian Nielson, Sanpete County Sheriff
- Kerry Nielso, Technical Rescue Team
- Justin Peterson, Questar Gas
- Hal Stevens, Manti-LaSal NF
- Stacy Willdens, CUCF EM Coordinator
- Lynne Cillion, American Red Cross
- Bev Waldon, American Red Cross
- MAH Reber, Gunnison City Utilities
- Chelsea Bakaitis, SCAOG
- Zachary Jenson, Gunnison Valley FD
- Jed Hansen, Gunnison Valley FD
- January 14, 2014: Wayne County Regional Assessment (article inviting public to attend published in Wayne County Insider)
 - In Attendance:
 - Gil Hunt, Bicknell Town Mayor
 - Stan Wood, Wayne County Commissioner
 - Tracie Fallis, Torrey Town Fire Department
 - Dennis Blackham, Wayne County Commissioner
 - Bob Mascaro, Special Service District #2
 - Eric Torgerson, Wayne County Building Official
 - Don Adams, Wayne County Fire Marshall
 - Jeff Gallacher, Utah DEM
 - Chelsea Bakaitis, SCAOG

Step 3: Establish Continuity in the Planning Process

Mitigation planning within Six County Association of Governments was part of a Pre-Disaster Mitigation Planning initiative to meet the requirements of the Disaster Mitigation Act of 2000. To meet this requirement the seven Associations of Government were contracted by the Utah Division of Emergency Management to assist the 29 counties with completion of a mitigation plan, which meets the requirements of sections 322.

Step 4: Data Acquisition

Contact was made with designated personnel in each city and county to assess what data was available on the local level (in conjunction with Step 2).

Step 5: Hazard Risk Identification and Analysis

This step was conducted by gathering data on the hazards that occurred in the planning area. This information was gathered from local, state, and federal agencies and organizations, as well as, from newspaper and other local media accounts, state and local weather records, conversations, surveys, interviews, and meetings with key informants within the planning area.

During these meetings (in conjunction with Step 2) attendees had the opportunity to review the general information on previous hazards and comment on them in a more specific manner. These

meeting also provided a forum for discussion on the background information that was needed to gain a general understanding of the geography, geology, recreation, natural resources, and water resources of the planning area. These initial contacts with local entities also provided visual understanding of the planning area for planners of the Core Planning Team.

Step 6: County Vulnerability Assessment

This step was conducted through a review of local base maps, topographical maps, floodplain maps, and other data.

Step 7: Community Goals Assessment

Leaders were asked to provide goals for their jurisdiction.

Step 8: Contact Regional Mitigation Emergency Managers

Juab, Millard, Piute, Sanpete, Sevier, and Wayne counties along with their respective communities were contacted to ascertain mitigation strategies. These counties and communities have volunteers and individuals with an interest in mitigation and public employees with technical expertise pertinent to mitigation. They include elected officials, county/city planners, county staff, and emergency managers.

Step 9: Mitigation Strategy Development

Developing the mitigation strategies was a process in which all of the previous steps were taken into account. Each jurisdiction that chose to participate were asked to evaluate the vulnerability assessment completed by SCAOG. They were also asked to provide their strategies for mitigation.

Every January SCAOG Office of Community and Economic Development visits individually with the mayor and other officials of every municipality part of the Region. Pre-Disaster Mitigation was discussed individually with every community in the month of January.

After the majority of assessment information was gathered and completed, SCAOG held meetings to create mitigation strategies per jurisdiction. Emergency Managers were asked how they would like to meet with each community to gather this information. The following is a listed summary per county as to how the mitigation strategies were gathered from the communities.

- **Juab County**

- Lt. Brent Pulver, Emergency Manager

- The mayors and staff of each Municipality of Juab County were contacted by phone, post mail, and e-mail. Individual meetings were set up with each.
 - March 26, 2015 each municipality was visited by Ms. Bakaitis and Lt. Pulver. They all preferred to provide a list of projects after consulting with their board or council.
 - Levan Town
 - Nephi City
 - Rocky Ridge Town
 - Eureka Town

- **Millard County**

Capt. Forrest Roper, Emergency Manager

- The mayors and staff of each Municipality of Millard County were contacted by phone, post mail and e-mail. Individual meetings were set up with each community that contact was able to be made with.
- April 14, 2015, Kanosh Town local officials were visited with by Ms. Bakaitis and Capt. Roper. Kanosh preferred to provide a list of projects after consulting with their board. They eventually decided to not participate in the planning process.
- April 16, 2015, Capt. Roper met with Delta City and Hinckley Town during their separate Board and Council meetings. They both preferred to provide a list of projects at a later date.
- April 21, 2015, Capt. Roper met with Fillmore City during their Council meeting. The City preferred to provide a list of projects at a later date.
- April 28, 2015, Ms. Bakaitis met with Leamington Town during their Historic Preservation Committee meeting (as requested). The Town indicated that they would like to instigate a project to prepare their Town Hall for flood and earthquake disaster.
- May 6, 2015, Ms. Bakaitis met with the Lynndyl Town Board to discuss a mitigation. The Town preferred to provide a list of projects at a later date.
- May 7, 2015, The Scipio Town Board Meeting was attended by Ms. Bakaitis and Capt. Roper. They discussed PDM, and the Board preferred to provide a list of projects at a later date.
- May 19, 2015, Ms. Bakaitis attended the Meadow Town Board meeting to discuss PDM. The Town agreed to participate and preferred to provide a list of projects at a later date.
- Oak City Town chose to opt out of providing mitigation strategies and participating in the plan, this was determined via correspondence with Mayor Ken Christiansen.
- Holden Town could not be contacted for mitigation projects after contact by phone, post mail, and e-mail. The community was called by phone four times more during the public comment period and no contact was able to be made. The former mayor, Brent Bennett, was reached and provided a mitigation project.

- **Piute County**

- Lt. Matt Whittaker
- The mayors and staff of each Municipality of Piute County were contacted by post-mail, phone, and e-mail.
- April 14, 2015, the following communities were visited by Lt. Whittaker and Ms. Bakaitis. PDM and possible projects was discussed with every jurisdiction.
 - Junction Town
 - Kingston Town
 - Circleville Town
 - Marysvale Town

- **Sanpete County**

Sgt. Jayson Albee

- The mayors and staff of each Municipality of Sanpete County were contacted by post-mail and email. In-person contact was made with each community in attendance at county-wide meeting.

- March 12, 2015, Sanpete Mayor and Landfill Meeting was attended by Ms. Bakaitis. She discussed PDM with the elected officials and asked for them to go back to their boards or councils and discuss mitigation projects. Worksheet 6.2 was provided and she asked the communities to contact her individually to go over material
- Communities that did not provide information were contacted by phone during the public comment period.
- **Sevier County**
 - Lt. Cody Barton
 - The mayors and staff of each Municipality of Sevier County were contacted by post-mail and email. In-person contact was made with each community in attendance at the county-wide meeting.
 - March 31, 2015, with the assistance of Lt. Barton, a Sevier County PDM meeting was held with Ms. Bakaitis in attendance. Elected officials and staff of every community were invited.
 - In attendance were:
 - Fran Washburn, Monroe
 - Matt Creamer, Richfield
 - Kim Peterson, Central Valley
 - Dave Ogden, Richfield
 - Terry Smith, Joseph
 - Ray Owens, Joseph
 - Troy C. Togerson, Monroe
 - Jeff Gallacher, Utah DEM
 - Communities not in attendance were contacted by Lt. Barton and Ms. Bakaitis by e-mail, phone, and post-mail.
- **Wayne County**
 - Jeri Johnson, Wayne County EMS
 - The mayors and staff of each Municipality of Wayne County were contacted by post-mail, e-mail and phone.
 - March 16, 2015, a meeting was held with all of the communities of Wayne County. Ms Johnson presided.
 - In attendance were representatives from:
 - Wayne County Commission
 - Wayne County Roads
 - Bicknell
 - Loa
 - Lyman
 - Hanksville
 - April 7, 2015, meet with Mayor Clenn Okerlund of Lyman Town to go over PDM projects and material. After the mayor met with Town Board, the decision was reached to not participate in Pre-Disaster Mitigation.
 - May 14, 2015, Ms Bakaitis and Ms Johnson met with Loa Town Board to discuss potential PDM projects for plan.

- May 26, 2015, Mr. Emery Polelonema, SCAOG Regional Planner, met with Hanksville Town Clerk to assist in creating a set of mitigation strategies.

During and after this process each jurisdiction had been contacted by phone, e-mail, or post mail more than four times.

Step 10: Prioritization of Identified Mitigation Strategies

The Disaster Mitigation Act of 2000 requires state, tribal, and local governments show how mitigation actions were evaluated and prioritized. This was completed by the AOGs with assistance from each county and city. Prioritization was done using the STAPLEE method explained in the FEMA How to Guide, 386-3, April 2003.

Additionally, jurisdictions reviewed the prioritization and understood that a benefit/cost analysis would aid in determining the true benefit to cost of each project. Prior to grant submittal a benefit/cost analysis would be completed for each project. At this time funding reality limited the project development, preventing a proper benefit/cost analysis from being conducted.

Step 11: State Review

The Utah Division of Emergency Management pulled together a formal PDM plan review committee to insure local plans met the requirements of DMA 2000. This step is forthcoming.

Step 12: Adoption

This step is forthcoming.

Public Involvement

The public meetings for this plan were central to the drafting process. It was made sure that nothing was put into the plan unless stated or consulted by staff or official of a jurisdiction. Feedback was incorporated into the planning process through the assessment and mitigation strategies. Throughout the plan, there is commentary for each community. Much of this commentary is based off of information provided by the communities. The mitigation strategies are almost exactly what was written up and provided by the communities. All meeting rosters may be found in Appendix ____.

Public involvement opportunities were available throughout the design and completion of this plan. Such opportunities included a public website for comment and review and public meetings. Public comments taken from these public meetings were incorporated into the plan. Emergency managers, the Fire Department, Sheriff Department, State and Local Agencies, all community members that could be affected by a hazard within the region, business leaders, educators, non-profit organizations, private organizations, and other interested members were all a part of the planning process.

It should be noted that in the rural setting of the region, most community planning and development occur in a collaborative effort. For example, the elected officials are business professionals and governmental officials (i.e. CPA's, School Administrators, small business owners, et al.), thus in one meeting a broad spectrum of interested parties are allowed the

opportunity to comment. The Six County Executive Board meetings are open to the public and attendees during these dialogues have the opportunity to comment. The county commission meetings are announced as open meetings, as well as, the city council meetings. County community and economic development professionals also have input during their regular meetings. In summation, SCAOG staff indeed provided a wide-open comment opportunity for all interested parties through these public venues.

The plan underwent a public comment period from May 27, 2015 to June 27, 2015. A notice for this comment period was published in all local publications. Proof of publication is included in Appendix _____.

SIX COUNTY REGIONAL PRE-DISASTER MITIGATION PLAN 2015 UPDATE
PUBLIC COMMENT PERIOD

Public comments will be accepted from May 27- June 29, 2015 regarding the Regional Pre-Disaster Mitigation Plan 2015 Update. This plan provides a natural hazard assessment for jurisdiction and mitigation strategies per community for each identified natural hazard. The plan is available at <http://www.sixcounty.com> or upon request a paper copy may be obtained from Chelsea Bakaitis at 250 North Main St, Suite B12, Richfield, UT 84701. You may contact Ms. Bakaitis for more information at [\(309\) 826-2923](tel:3098262923) or cbakaitis@gmail.com.

All mayors and commissioners were emailed and notified of the public comment period. Communities that did not provide information were contacted phone. Those who assisted with this effort were Jeff Gallacher, Utah DEM Regional Liason, Russell Cowley, SCAOG Executive Director, Emery Polelonema, SCAOG Planning Director, and Chelsea Bakaitis, SCAOG Regional Planner.

Information Sources

The following sources were look at during the completion of this plan:

- Federal Emergency Management Agency (How-to Guides).
- National Weather Service (Hazard profile).
- National Climate Data Center (Drought, Severe Weather)
- Army Corps of Engineers (Flood data).
- Utah Utah Division of Emergency Management (Bear River Association of Governments PDM plan, Salt Lake City PDM Plan, GIS data, Flood data, HAZUS data for flood and earthquake).
- Utah Geologic Survey (GIS data, Geologic information).
- Utah Division of Forestry, Fire and State Lands (Fire data).
- Utah Automated Geographic Resource Center (GIS data).
- University of Utah Seismic Station (Earthquake data).
- Utah State University (climate data).
- Councils of Governments
- Association of Governments
- Juab County and municipalities (Nephi Stormwater Plan, Histories, mitigation actions, public input).
- Millard County and municipalities (Histories, mitigation actions, public).
- Piute County and municipalities (Histories, mitigation actions, public input).
- Sanpete County and municipalities (Histories, mitigation actions).

- Sevier County and municipalities (Emergency Operations Plans, Histories, mitigation actions, public input).
- Wayne County and municipalities (Histories, mitigation actions, public input).

Plan Methodology

The information in this mitigation plan is based on research from a variety of sources. SCAOG/DES conducted data research and analysis, facilitated steering committee meetings and public workshops, developed the final mitigation plan, and presented the plan for formal adoption with participating jurisdictions. The research methods and various contributions to the plan include:

State and federal guidelines and requirements for mitigation plans:

During the completion of this plan SCAOG examined and followed state and federal guidelines and requirements. These guidelines included FEMA planning standards, National Flood Insurance Program's Community Rating system, FEMA Flood Mitigation Assistance Program and various State reference material. A list of guidelines and requirements is as follows:

- FEMA 386-1,2,3,4,5,6,7,8,9
- FEMA Post Disaster Hazard Mitigation Planning Guidance DAP-12
- Disaster Mitigation Act of 2000
- 44 CRF parts 201 and 206, Interim Final Rule
- FEMA Region VIII Mitigation Plan Review Tool

Previous plans and studies:

SCAOG examined existing mitigation plans from around the country and incorporated numerous plans and studies from within the jurisdictions they serve. These plans include:

- West Colorado River Basin Plan
- West Desert Basin Plan
- Sevier River Basin Plan
- Manti City Flood Insurance Study
- Elsinore City Flood Insurance Study
- Town of Joseph Flood Insurance Study
- Richfield City Flood Insurance Study
- Salina City Flood Insurance Study
- Utah Statewide Fire Risk Assessment Project
- State of Utah Mitigation Plan 2014
- Six County Flood Hazard Identification Study, USACE 2003
- Emergency Operations Plans for Juab, Millard, Piute, Sanpete, Sevier, and Wayne Counties.
- University of Utah Seismograph Stations History of Utah Earthquakes

Risk Assessment

The Hazard Identification Process

Past hazards and vulnerable areas were identified by a series of meetings with local leaders and input from county hazard mitigation managers. Current reports, mapping analysis and historical review also informed the hazards and vulnerabilities mentioned in this report.

Natural hazards differ throughout the state and throughout the SCAOG study area, based on variables such as underlying geology, topography, hydrology, development patterns, and climate. For this reason a risk assessment was conducted by the Six County Association of Governments to determine what natural hazards might affect the Pre-Disaster Mitigation planning.

Hazards were identified using a survey completed by each jurisdiction. In addition, the Core Planning Team examined disaster histories and talked with technical experts. All finds were then further examined in meetings with the Core Planning Team and each county and municipality participating in the process.

Table 1-1 : Identified and Analyzed Hazards in the SCAOG Region		
All Identified Potential Hazards	Natural Hazards in Plan	
Avalanche Dam failure Drought Earthquake Flooding Landslides Liquefaction Micro burst winds Severe weather Wildfire	Dam failure Earthquake Flooding Landslide Wildfire Drought Severe Weather	
Hazard	How Identified	Why Identified
Dam Failure	Review of County Emergency Operations Plans Assistance from Utah Division of Water Rights, Dam Safety Section Community's profile Spatial Hazard Events and Losses Database	Can cause serious damage to life and property and have subsequent effects such as flooding, fire, debris flow, etc.
Drought	Review of County Emergency Operations Plans Community's profile National Climate Data Center Palmer Drought Severity Index readings Spatial Hazard Events and Losses Database	Affects local economy, water reservoirs, soil Previous experiences
Earthquake	Review of County Emergency Operations Plans Input from City and County Emergency	Utah is predicted, 1/5 chance, to experience a large earthquake within the next fifty years. Numerous faults throughout Utah Utah experiences approximately 13 earthquakes a year with a magnitude over 3.0.

	<p>Operations Managers United States Geological Survey Utah Geological Survey HAZUS analysis Spatial Hazard Events and Losses Database</p>	<p>Can create fire, flooding, hazardous materials incident, transportation and communication limitations</p>
<p>Flooding</p>	<p>Review of County Emergency Operations Plans Review of past disaster declarations Input from City and County Emergency Operations Managers Utah Division of Water Resources Utah Geological Survey Flood Insurance Studies Army Corps of Engineers Spatial Hazard Events and Losses Database</p>	<p>Associated with drought and dry soils that the State is frequented with Several previous incidents have caused severe damage and loss of life Many of the rivers and streams are located near neighborhoods Many neighborhoods are located on floodplains, alluvial fans Associated with drought and dry soils that the State is frequented with Previous incidents have caused severe damage and loss of life Many neighborhoods are located near canyon mouths and on floodplains</p>
<p>Slope Failure (landslide, debris flow and slide)</p>	<p>Review of County Emergency Operations Plans Utah Geological Survey Input from County Emergency Managers Community's profile Community's profile National Climate Data Center GIS analysis Past State Mitigation Plans Spatial Hazard Events and Losses Database</p>	<p>Most properties and residential areas are not affected and have not been significantly affected in the past. Even so a few areas have experienced property damage in the past.</p>
<p>Wildfire</p>	<p>Review of County Emergency Operations Plans Review of past disaster declarations Input from City and County Emergency Operations Managers Utah Division of Forestry, Fire and State Lands Spatial Hazard Events and Losses Database</p>	<p>Wildfire is a significant threat as identified by the UDFFS, county, and community leaders. Past incidents have caused loss of life, property damage, and communications. It is also an expensive hazard to control, and occurs on an annual basis.</p>

Severe Weather	Review of County Emergency Operations Plans Review of past disaster declarations Input from City and County Emergency Operations Managers National Climatic Data Center Spatial Hazard Events and Losses Database	Severe weather has affected every area. Although damage is usually low cost, it is a hazard that is difficult to predict and prevent damage from.
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GENERAL REGIONAL DATA

As the name states the Six County Association of Governments is comprised of six Utah Counties: Juab, Millard, Piute, Sanpete, Sevier, and Wayne. This plan incorporates the following entities within each county, although not every listed community participated in the data gathering process.

Juab County

Contained within Juab County are five incorporated areas: Eureka City, Town of Levan, Mona Town, Nephi City, and Rocky Ridge Town.

Millard County

There are 10 incorporated municipalities within Millard County: Delta City, Fillmore City, Hinckley Town, Holden Town, Kanosh Town, Leamington Town, Lynndyl Town, Meadow Town, Town of Oak City, and Scipio Town.

Piute County

Contained within Piute County are four municipalities: the Town of Circleville, Junction Town, Kingston Town, and Marysvale Town.

Sanpete County

Sanpete County the most populous county in the Six County region contains 13 municipalities: Centerfield Town, Ephraim City, Fairview City, Town of Fayette, Fountain Green City, Gunnison City, Manti City, Mayfield Town, Moroni City, Mt. Pleasant City, Spring City, Town of Sterling, and Wales Town.

Sevier County

Within Sevier County are 11 municipalities: Annabella Town, City of Aurora, Elsinore Town, Central Valley Town, Glenwood Town, Joseph Town, Koosharem Town, Monroe City, Redmond Town, Richfield City, Salina City, and the Town of Sigurd.

Wayne County

Within Wayne County are five municipalities: Bicknell Town, Hanksville Town, Loa Town, Lyman Town, and Torrey Town.

Demographics

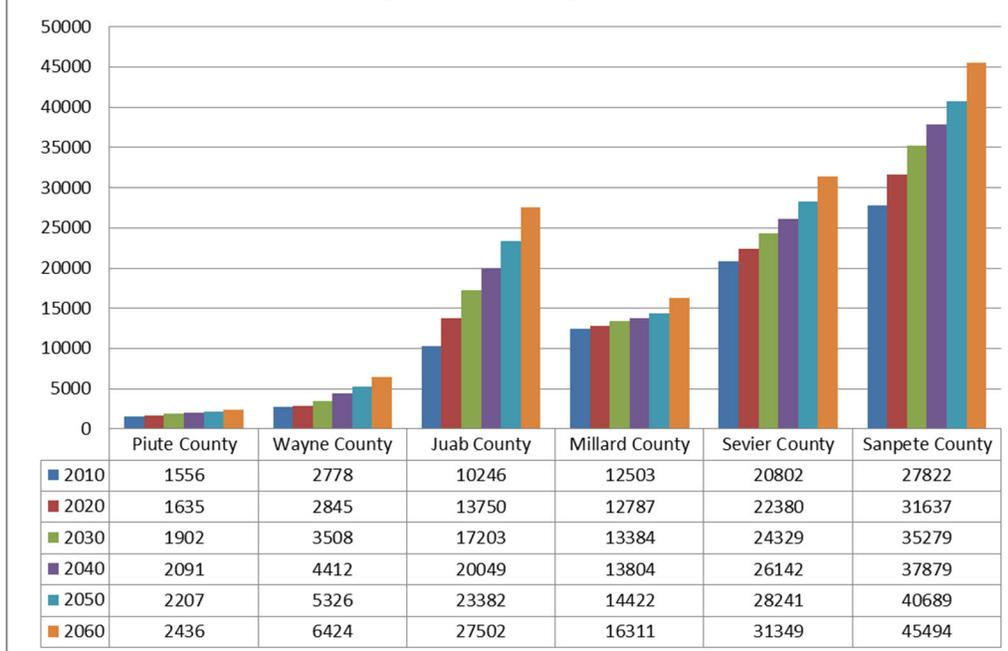
According to 2010 population estimates there were 75,707 people living in the Six County region. The region experienced a 13% increase from the year 2000 with a then population of 66,192. In 1990 the population was 52,294. According to population projections there is expected to be a steady increase in the next 50 years, especially in Juab and Sanpete counties. These counties are closest to the growing Wasatch Front. There also, along with population has been a steady increase in the number of households, especially in the counties mentioned above. This indicates some new development.

County Population Comparisons

County Population Comparisons and Projections

Figure 1-2:

Population Projections



Source: U.S. Census Bureau / Governor’s Office of Planning & Budget 2012 Baseline Projections / Six County Planning Estimates

Table 1-3: Household Projections

Number of Households	1990-2060							
	1990	2000	2010	2020	2030	2040	2050	2060
Juab County	1,861	2,466	3,093	4,424	5,811	6,976	8,325	9,810
Millard County	3,396	3,848	4,201	4,399	4,611	4,661	4,820	5,314
Piute County	443	506	576	610	704	755	814	927
Sanpete County	4,948	6,562	7,966	9,455	11,007	11,950	12,959	14,521
Sevier County	4,929	6,096	7,094	7,863	8,750	9,471	10,283	11,361
Wayne County	707	898	1,059	1,111	1,390	1,697	2,060	2,508
Central MCD	16,284	20,376	23,989	27,862	32,273	35,510	39,261	44,441

Source: Governor's Office of Planning and Budget 2012 Baseline Projections

Overall, the Six County region is not growing much in comparison to the rest of the state. The Percent of state total of population is consistently between 2% and 3%. Every decade the region is expected to have a lower percentage of the state total population. Juab County is the exception, and expected to grow in the percent of state total population.

Table 1-4: Percent of State Total Population, By County and Multi-County District 1990-2060

	1990	2000	2010	2020	2030	2040	2050	2060
Juab County	0.34%	0.37%	0.37%	0.42%	0.44%	0.44%	0.44%	0.46%
Millard County	0.65%	0.55%	0.45%	0.39%	0.34%	0.30%	0.27%	0.27%
Piute County	0.07%	0.06%	0.06%	0.05%	0.05%	0.05%	0.04%	0.04%
Sanpete County	0.94%	1.02%	1.01%	0.96%	0.90%	0.83%	0.77%	0.76%
Sevier County	0.89%	0.84%	0.75%	0.68%	0.62%	0.57%	0.54%	0.53%
Wayne County	0.13%	0.11%	0.10%	0.09%	0.09%	0.10%	0.10%	0.11%

Central MCD	3.03%	2.96%	2.73%	2.57%	2.44%	2.28%	2.17%	2.17%
Source: Governor's Office of Planning and Budget 2012 Baseline Projections								

	1990	2000	2010	2020	2030	2040	2050	2060
Juab County	0.34%	0.35%	0.35%	0.41%	0.42%	0.43%	0.44%	0.45%
Millard County	0.63%	0.55%	0.48%	0.40%	0.34%	0.28%	0.25%	0.24%
Piute County	0.08%	0.07%	0.07%	0.06%	0.05%	0.05%	0.04%	0.04%
Sanpete County	0.91%	0.93%	0.90%	0.87%	0.80%	0.73%	0.68%	0.66%
Sevier County	0.91%	0.86%	0.81%	0.72%	0.64%	0.58%	0.54%	0.52%
Wayne County	0.13%	0.13%	0.12%	0.10%	0.10%	0.10%	0.11%	0.11%
Central MCD	3.01%	2.89%	2.72%	2.56%	2.35%	2.16%	2.06%	2.03%

	1990	2000	2010	2020	2030	2040	2050	2060
Juab County	3.08	3.31	3.27	3.07	2.92	2.84	2.77	2.77
Millard County	3.30	3.19	2.95	2.88	2.87	2.93	2.96	3.04
Piute County	2.87	2.79	2.64	2.62	2.64	2.70	2.65	2.57
Sanpete County	3.19	3.27	3.20	3.06	2.94	2.89	2.88	2.88
Sevier County	3.10	3.03	2.89	2.80	2.74	2.71	2.70	2.71
Wayne County	3.05	2.81	2.61	2.55	2.52	2.59	2.58	2.55
Central MCD	3.16	3.16	3.03	2.93	2.85	2.82	2.80	2.81
State of Utah	3.14	3.13	3.10	2.99	2.80	2.74	2.71	2.68
United States	2.63	2.59	2.58	2.50	2.44	2.42	2.42	2.41
Source: Governor's Office of Planning and Budget 2012 Baseline Projections								

Diversity in the ethnic composition of the Six County Region has increased over the past 20 years, although it is still a large majority white. Industrial growth utilizing workers from minority populations has contributed to this change.

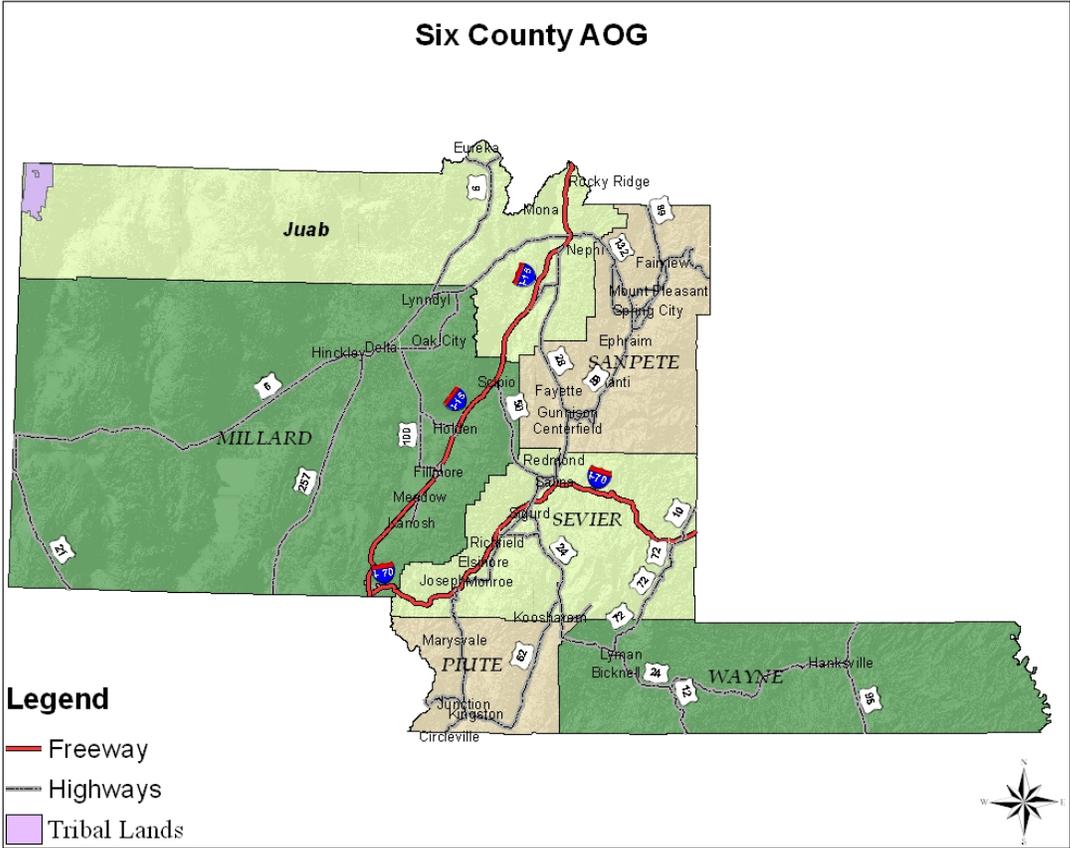
Subject	Juab	Millard	Piute	Sanpete	Sevier	Wayne
One race	99%	99%	99%	99%	99%	100%
White	97%	94%	97%	92%	95%	98%
Black or African American	0%	1%	0%	1%	1%	1%
American Indian and Alaska Native	1%	1%	0%	1%	1%	1%
Asian	0%	0%	0%	1%	0%	0%
Native Hawaiian and Other Pacific Islander	0%	0%	0%	1%	0%	0%
Some other race	0%	3%	2%	4%	1%	0%
Two or more races	1%	1%	1%	1%	1%	0%
Hispanic or Latino origin (of any race)	4%	13%	8%	9%	5%	4%
White alone, not Hispanic or Latino	94%	85%	92%	87%	93%	94%
Other minorities	2%	2%		4%	2%	2%

Source: U.S. Census Bureau 2010

Geographic and Physiographic Background

The Six County region is located in the center of the State of Utah. It is geographically located approximately 500 miles from Denver, Colorado; 600 miles from Los Angeles, California; and 600 miles from Phoenix, Arizona. Travel time from the District Offices in Richfield to County Economic Development Offices in Nephi, Delta, Junction, Ephraim, Richfield, and Loa are: 90 minutes, 80 minutes, 45 minutes, 60 minutes, 0 minutes, and 50 minutes respectively. Interstates 15 and 70 serve the Six County region.

Figure 1-8: Six County Region



The Six County region contains 16,698 square miles making it the third largest region in the state of Utah behind Five County AOG and, Southeastern AOG. However, Six County encompasses 96% of the area of Five County AOG and makes up just over 20% of the land area of the entire state of Utah. Putting this in perspective, you could fit the states of New Hampshire and New Jersey within Six County’s borders and still have room for Davis County, Utah. In addition, the combined population of New Hampshire, New Jersey, and Davis County is 10,414,843 which combined are more than 138 times Six County’s 75,707.

The varied landscape has been divided into four major physiographic provinces: the **Basin and Range Province** of the western part; the **Middle Rocky Mountain Province** which includes the

Wasatch Range in the extreme north; the **Colorado Plateau Province** of canyons, mountains, and plateaus in the east; and the **Basin and Range-Colorado Plateau Transition** in the center of the Six County region. The last area is also known as the “High Plateaus” and shares structural features such as faults with its eastern and western neighbors.

Most of the Six County region is dry. The Great Basin and Colorado Plateau receive the least amount of precipitation, about 5-10 inches annually. The transition zone, which has the highest population density, averages about 13 inches of annual precipitation. However, rainwater runs quickly off the rocky desert surfaces and into gullies and canyons. Flash floods can form and sweep away anything in their path, including boulders, cars, and campsites. Summer lightning causes forest and brush fires threatening the wide variety of flora and fauna, as well as cabins and homes, in the area.

Physiography

West Colorado River Basin

Wayne County falls almost entirely within the West Colorado River Basin, which is entirely within the Colorado Plateau Physiographic Province. Located within Wayne County are the Dirty Devil, Fremont, and Green Rivers along with the confluence of the Green and Colorado Rivers along its eastern boundary. The Colorado Plateau Physiographic Province is best characterized by high relief between the many tablelands or plateaus and intervening stream cut valleys with deep, steep-sided canyons. Elevations within the Wayne County portion of the Colorado Plateau exceed 11,000 in both the Thousand Lake Mountains and Boulder Mountains.

Sevier River Basin

The majority of the Six County region is within the Sevier River Basin. This basin is part of the landlocked Great Basin Region drains which the Sevier River proper, the Fillmore-Kanosh area, often called the Pahvant Valley, and Beaver River drainage. The Sevier River drainage is separated from the ocean by prominent mountain ranges and geologic features on all four sides. The basin is bounded by the Pink Cliffs, of the Grand Stair Case, Wasatch Plateau, Tintic Mountains, Sheeprock Mountains, Tushar Mountains, Markagunt Plateau, and Pahvant Range.

The topography is diverse, with irrigated valleys between 4,600 and 7,000 feet above sea level. The highest point in the basin is Delano Peak which crowns the Tushar Mountains at 12,173 feet. Twelve additional peaks within the basin rise over 11,000 feet.

Within the mixed physiography, each plateau and mountain range has its own character, influencing soils as well as surface and groundwater hydrology. Past erosion and deposition cycles have left piedmont benches and terraces, and produced spectacular scenery.

West Desert Basin

The western half of Juab and Millard Counties fall within the West Desert Basin. This basin lies within the Great Basin Physiographic province and has no external drainage. The basin consists mainly of broad arid alleviated valleys bounded by a series of mountainous regions. Mountain Ranges within the basin run north and south with peaks reaching over 10,000 feet. Contained

within the SCAOG portion of the West Desert Basin are the Fish Springs Range, Confusion Range, and the Deep Creek Mountains.

Climate & Geology

For the purpose of geologic, climatic and physiographic descriptions within Six County the following narratives will follow river basins rather than political subdivisions or municipal boundaries. Six County falls within three river basins the West Colorado River Basin, Sevier River Basin, and West Desert Basin.

Climate

West Colorado River Basin

Precipitation in the area is influenced by two major storm patterns: one, frontal systems from the Pacific Northwest during winter and spring; the other late summer and early fall thunderstorms from the south and southwest. The southern Utah Low, a high altitude low-pressure system often covering parts of the several states, causes widespread precipitation between the winter frontal systems and summer thunderstorms.

The precipitation ranges from over 30 inches on the Wasatch and Fish Lake plateaus to less than eight inches in the desert areas of the central and southern parts of the basin. Annual water surface pan evaporation varies from about 45 inches at Loa to 58 inches at Hite Marina on Lake Powell. Possible sunshine varies from 85 percent during the summer to 45 percent during the winter. Prevailing winds are generally from the southwest at four to six miles per hour, with maximum wind movement generally occurring during May.

Sevier River Basin

The climate of the Sevier River Basin reflects its location in the transition zone from the Basin and Range Physiographic Province to the Rocky Mountain Colorado Plateau Provinces. The high mountain valleys in the upper drainage areas blend into the semi-arid climate common to the southwest deserts. The northern part of the basin reflects different storm patterns than the southern part.

Mean annual temperatures vary from a high of 50.9 F at Fillmore to a low of 43.9 F at Koosharem. The record high temperature is 110 F at Delta and the record low is -40 F at Scipio.

Precipitation is influenced by two major storm patterns: one, frontal systems from the Pacific Northwest during the winter and spring; the other, late summer and early fall thunderstorms from the south and southwest. Topographic aspects further influence weather systems.

Mean annual valley precipitation varies from a high of 16.00 inches at Fillmore to a low of 8.11 inches at Delta. Basin wide precipitation varies from more than 35 inches in the highest mountains to less than 8 inches in the Sevier Desert. Precipitation extremes include a daily valley rainfall of 2.61 inches at Circleville and a record daily snowfall of 33.3 inches at Gunnison.

West Desert Basin

The climate of the West Desert Basin is typical of mountain-desert areas in the west with wide ranges in temperature between summer and winter, and between day and night. The high mountain regions experience long, cold winters, and short, cool summers. The lower valleys experience greater seasonal fluctuations with temperatures ranging from recorded extremes of -40° F at Ibabah in the winter to over 110° F in arid valleys during the summer. Daily temperature fluctuations can be dramatic; it is not uncommon to have temperature swings of over 40 degrees during any season.

The West Desert Basin lies within the rain shadow of the Sierra Nevada Mountains and except for the high mountaintops; the lands within the basin are classified as arid or semi-arid. June to September is the driest part of the year with precipitation at its lowest and evapo-transpiration rates at their highest. Little benefit is obtained from summer rains that are either too light to soak the soil, or come as cloudbursts resulting in rapid run-off and consequently providing little soil moisture.

Geology

West Colorado River Basin

Within this basin, each plateau, mountain and canyon has its own character, which influences soil forming processes and the surface and groundwater hydrology. Past erosion and deposition cycles have left pediment slopes and terraces. Rocks from all eras of geologic time are found here with large areas being covered by sedimentary rocks of Mesozoic age. Included in this group is the Navajo Sandstone, which is an important source of groundwater. Igneous rock is found on many of the basins mountain ranges. In many places they occur as Tertiary age extrusive basalt, andesite, and latite lava flows and dacitic to rhyolitic ash flow tuffs. Unconsolidated eolian and alluvial deposits cover small areas.

While the Colorado Plateau is characteristically aseismic and lacks the large faults found in the transition zone to the west, the rocks in this basin have suffered much structural deformation. Powerful forces at work in the crust of this area have resulted in the formation of large folds, anticlines, synclines, and monoclines. These features have a tremendous influence on the occurrence and movement of surface water and groundwater. Some of these features include the Waterpocket Fold, the Cockscomb Ridge, Caineville Monocline, and the Saleratus Creek Syncline.

Sevier River Basin

Rocks from all eras of geologic time are represented, but either Tertiary volcanic or Jurassic, Cretaceous, Tertiary or Quaternary sediments cover most of the area. Quaternary basalts are found on the Markagunt and Paunsaugunt plateaus and in the Sevier Desert.

Two major faults trend northeasterly through the area. The Paunsaugant fault runs from northern Arizona, past Bryce Canyon, through Grass Valley. The Sevier fault runs from near Pipe Springs in northern Arizona, through the eastern side of Sevier Valley, and into Sanpete Valley to the Cedar Hills. A third fault, the Elsinore fault, although smaller is one of the most active faults in Utah.

West Desert Basin

Mountain blocks are composed mostly of rocks or Paleozoic and Precambrian age. These hard, brittle rocks are permeable when fractured, and can provide groundwater aquifers. The Paleozoic formations include several limestone and dolomite units, which constitute an important regional aquifer system. The centers of the valleys and basins are typically underlain with lacustrine silts and clay, which have low permeability, and contain water with high dissolved solids. The alluvial slopes fringing the mountain blocks are composed of more permeable sand and gravel, and form important local aquifers.

National Flood Insurance Program Participation

The National Flood Insurance Program was created in 1968 by the Federal Emergency Management Agency (FEMA) to provide homeowners living in the 100-year floodplain an opportunity to purchase flood insurance for their home. In order for individuals to be eligible to purchase flood insurance, their community needs to be a member of the National Flood Insurance Program (NFIP). It is fairly simple to join the NFIP with help from the State Floodplain Manager. There is also limited funding for flood mitigation projects for communities that are members of the NFIP.

About Participation

Communities participate by enforcing a floodplain ordinance. The following chart shows which communities participate and which do not.

County	Community Name	CID	Current Effective Map Date	Date of Entry
JUAB COUNTY	EUREKA, CITY OF	490079#	12/4/2007	03/01/1986
	LEVAN, TOWN OF	490080	(NSFHA)	02/02/1984
	NEPHI, CITY OF	490229#	12/4/2007	08/05/1986
MILLARD COUNTY	DELTA, CITY OF	490206	(NSFHA)	12/9/1985
	FILLMORE, CITY OF	490087	(NSFHA)	11/5/1985
	HINCKLEY, TOWN OF	490200	(NSFHA)	11/30/1983
	HOLDEN, TOWN OF	490201	03/01/1986(L)	03/01/1986
	KANOSH, CITY OF	490088	(NSFHA)	12/11/1985
	LEAMINGTON, TOWN OF	490246#	(All Zone D)	09/04/1987
	MILLARD COUNTY*	490233#	(All Zone D)	09/04/1987
	OAK CITY, TOWN OF	490090	(NSFHA)	02/02/1984
	SCIPIO, TOWN OF	490091	(NSFHA)	02/02/1984
PIUTE COUNTY	CIRCLEVILLE, TOWN OF	490095	(NSFHA)	01/30/1984
	JUNCTION, TOWN OF	490096#	01/16/1987	01/16/1987
	MARYSVALE, CITY OF	490098#	02/05/1986(M)	02/05/1986
	PIUTE COUNTY *	490094#	03/18/1986(M)	03/18/1986
SANPETE	EPHRAIM, CITY OF	490112#	05/02/2012(M)	04/03/1987

COUNTY	FAIRVIEW, CITY OF	490113#	05/02/2012(M)	02/01/1987
	FOUNTAIN GREEN, CITY OF	490114#	05/02/2012(M)	01/17/2013
	GUNNISON, CITY OF	490115#	05/02/2012(M)	01/30/1984
	MANTI, CITY OF	490116#	05/02/2012(M)	08/04/1987
	MAYFIELD, TOWN OF	490117#	05/02/2012(M)	05/02/2012
	MORONI, CITY OF	490118#	05/02/2012(M)	08/05/1980
	MOUNT PLEASANT, CITY OF	490213#	05/02/2012(M)	09/24/1984
	SANPETE COUNTY*	490111#	05/02/2012(M)	06/01/1986
	SPRING CITY, CITY OF	490119#	05/02/2012(M)	08/05/1980
SEVIER COUNTY	ANNABELLA, TOWN OF	490122#	12/18/2012	10/30/1979
	AURORA, CITY OF	490123#	01/12/82(M)	12/4/1979
	CENTRAL VALLEY, TOWN OF	495519#	12/18/2012	12/18/2012
	ELSINORE, TOWN OF	490125#	12/18/2012	08/14/1979
	GLENWOOD, TOWN OF	490126	07/01/1986(L)	07/01/1986
	JOSEPH, TOWN OF	490127#	12/18/2012	08/28/1979
	KOOSHAREM, TOWN OF	490128#	(NSFHA)	02/02/1984
	MONROE CITY, CITY OF	490129#	12/18/2012	07/24/1979
	REDMOND, TOWN OF	490130	(NSFHA)	11/30/1983
	RICHFIELD, CITY OF	490131#	12/18/2012	09/29/1986
	SALINA, CITY OF	490132#	09/29/1986	09/29/1986
	SEVIER COUNTY *	490121#	12/18/2012	07/01/1986
	SIGURD, CITY OF	490133	01/01/1986(L)	01/01/1986
WAYNE COUNTY	BICKNELL, TOWN OF	490184	(NSFHA)	01/30/1984
	TORREY, TOWN OF	490186	(NSFHA)	06/18/1986

Communities Not in the National Flood Program

County	Community Name	CID	Current Effective Map Date	Sanction Date
MILLARD COUNTY	MEADOW, TOWN OF	490089	07/02/1976	07/02/1977
PIUTE COUNTY	KINGSTON, TOWN OF	490097	02/04/1977	02/04/1978
SANPETE COUNTY	STERLING, TOWN OF	490170#	05/02/2012	05/02/2013
	WALES, TOWN OF	490120#	05/02/2012	05/02/2013
WAYNE COUNTY	LOA, TOWN OF	490185	12/20/1974	12/20/1975

Legend:

(E)	Indicates Entry In Emergency Program
NSFHA	No Special Flood Hazard Area - All Zone C
(>)	Date of Current Effective Map is after the Date of This Report
N/A	Not Applicable At This Time

(S)	Suspended Community
(W)	Withdrawn Community
(M)	No Elevation Determined - All Zone A, C and X
(L)	Original FIRM by Letter - All Zone A, C and X
*	Unincorporated areas only
Source: Federal Emergency Management Agency Community Status Book Report: Utah	

Building Code Effectiveness Grading BCEGS Scores:

The Insurance Services Office, Inc. performs building Code Effectiveness Grading Reports (BCEGS). The program implemented in 1995 assesses the building codes in effect in a particular community and how well the community enforces its building codes. The BCEGS program assigns each municipality a BCEGS grade of 1 to 10 with one showing exemplary commitment to building code enforcement. Insurance Services Inc. (ISO) developed advisory rating credits that apply to ranges of BCEGS classifications 1-3, 4-7, 8-9, 10. ISO gives insurers BCEGS classifications, BCEGS advisory credits, and related underwriting information. The concept is that communities with effective, well-enforced building codes should sustain less damage in the event of a natural disaster, and insurance rates can reflect that. The prospect of lessening natural hazard related damage and ultimately lowering insurance costs provides an incentive for communities to enforce their building codes rigorously.

Table 1-10: BCEGS

Community	County	Commercial Score	Residential Score	Date Completed
Eureka	Juab	4	4	2000
Nephi	Juab	6	6	2001
Fillmore	Millard	4	4	2000
Millard County	Millard	4	4	1997
Sanpete County	Sanpete	4	4	2001
Sevier County	Sevier	3	3	2001

Hazard Definitions

The following is a description of each of the hazards evaluated in the SCAOG Region's Pre-disaster Mitigation Plan. These definitions, with minor modifications and additions, were developed by the Federal Emergency Management Agency (FEMA).

Flood

- A general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties (at least one of which is the policyholder's property) from:
 - Overflow of inland or tidal waters; or
 - Unusual and rapid accumulation or runoff of surface waters from any source; or

- Mudflow; or
- Collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above.
- **Explanation of Common Flood Terms**
 - **Flood Insurance Rate Map (FIRM)**--Official map of a community on which FEMA has delineated the Special Flood Hazard Areas (SFHAs), the Base Flood Elevations (BFEs), and the risk premium zones applicable to the community.
 - **Base Flood**--A flood having a one percent chance of being equaled or exceeded in any given year.
 - **100-year flood:** Applies to an area that has 1 percent chance, on average, of flooding in any given year. However, a 100-year flood could occur in two years in a row, or once every 10 years. The 100 year-flood is also referred to as the base flood.
 - **Base Flood Elevation (BFE)**--The elevation of surface water resulting from a flood that has a 1 percent chance of equaling or exceeding that level in any given year. The BFE is shown on the Flood Insurance Rate Map (FIRM) for zones AE, AH, A1–A30, AR, AR/A, AR/AE, AR/A1– A30, AR/AH, AR/AO, V1–V30, and VE.
 - **Special Flood Hazard Area (SFHA)**--An area having special flood, mudflow, or flood-related erosion hazards, and shown on a Flood Hazard Boundary Map or a Flood Insurance Rate Map as Zone A, AO, A1-A30, AE, A99, AH, AR, AR/A, AR/AE, AR/AH, AR/AO, AR/A1-A30, V1-V30, VE, or V. For the purpose of determining Community Rating System premium discounts, all AR and A99 zones are treated as non-SFHAs.

Earthquake

An earthquake is ground shaking caused by a sudden movement of rock in the Earth's crust. Such movements occur along faults, which are thin zones of crushed rock separating blocks of crust. When one block suddenly slips and moves relative to the other along a fault, the energy released creates vibrations called seismic waves that radiate up through the crust to the Earth's surface, causing the ground to shake.

Earthquakes may last only a few seconds or may continue for up to several minutes. They can occur at any time of the day or night and at any time of the year. They are caused by stress that builds up over time as blocks of crust attempt to move but are held in place by friction along a fault. (The Earth's crust is divided into large plates that continually move over, under, alongside, or apart from one another atop the partly molten outer layer of the Earth's core.) When the pressure to move becomes stronger than the friction holding them together, adjoining blocks of crust can suddenly slip, rupturing the fault and creating an earthquake.

The Intermountain Seismic Belt

The intermountain Seismic Belt (ISB), which the Six County Region is a part of, is a zone of pronounced earthquake activity up to 120 miles wide extending in a north- south direction 800 miles from Montana to northern Arizona. The Utah portion of the ISB trends from the eastern

Box elder County and Cache County area south through the center of the State, along the Wasatch Front, and then southwest through Richfield and Cedar City, concluding in St. George.

Secondary Earthquake Threats

The major secondary effects of earthquakes include: ground shaking, surface fault rupture, liquefaction, tectonic subsidence, avalanches, rock fall, slope failure, and various types of flooding. Other sections discuss landslides, and flooding therefore they will not be discussed under secondary effects of earthquakes yet importance needs to be given to the fact that earthquakes can increase the likelihood of flooding and landslides:

Ground shaking

Strong ground shaking is the greatest hazard during an earthquake because it affects large areas and induces many of the other hazards associated with earthquakes. The intensity of ground shaking in a particular area will depend on the earthquake's location and magnitude, and the local geologic conditions. The shaking generally lasts only a few seconds, and typically lasts 10 to 30 seconds in a moderate to large event. Aftershocks can occur intermittently for weeks or months after the main earthquake. Ground shaking is caused by the passage of seismic waves generated by the earthquake. The waves move the surface laterally and vertically. The lateral motion caused by earthquake waves is responsible for the most damage to buildings, because many older buildings were designed chiefly to withstand vertical loads and not lateral loads. Shaking damages buildings and other structures, either by partial failure or total collapse, and their contents (called non-structural damage) and is a leading cause of death and injury during an earthquake.

Surface Fault Rupture

During a large earthquake, the fault movement (rupture) at depth may propagate upward along the fault plane and cause rupture of the ground surface. Because earthquakes in Utah result from faulting in which relative movement between blocks of the Earth's crust is mostly vertical, surface ruptures result in formation of scarps, or steep breaks in slope. Recurrent surface faulting can produce high scarps, and this is evident today chiefly along mountain fronts throughout the ISB where repeated prehistoric earthquakes have left significant scarps.

Liquefaction

Soil liquefaction can occur when water-saturated, sandy soils are subjected to ground shaking. The soils "liquefy" or become like quicksand, lose bearing capacity and shear strength, and readily flow on the gentlest of slopes. Liquefaction can cause damage in several ways. On sloping ground, liquefaction can produce various types of mass movement, including lateral spreading and flows. Liquefaction can occur during earthquakes of magnitude 5.0 and greater in areas of shallow ground water and sandy soils such as in low-lying areas of basins and stream valleys. The greatest liquefaction hazard is in the valleys of the Wasatch Front and central Utah, following the general trend of other earthquake hazards. The longer the duration of strong ground shaking, the greater the liquefaction hazard.

Flooding

Earthquakes can induce flooding due to tectonic subsidence and tilting (previously discussed), dam failure, seiches in lakes and reservoirs, surface-water diversion, and increased ground-water discharge. Flooding due to failure of a major dam would probably cause the most property damage and loss of life.

Seiches are waves generated in closed-basin bodies of water such as lakes and reservoirs when ground shaking causes sloshing of the water. Seiches can cause shoreline flooding, erosion, damage to in-lake structures (causeway embankments across Great Salt Lake, docks, solar-pond operations), and they can overtop a dam causing dam failure. Flooding can result from disruption of surface drainage. Water tanks, pipelines, and aqueducts may be ruptured, or canals and stream courses diverted by ground shaking, surface faulting, ground tilting, and land sliding during earthquakes. Ground-water discharge may increase, causing local surface flooding and erosion.

Landslides

Landslides are classified according to the types of movement and material involved. The types of movement include fall, topple, slide, spread, and flow. The types of material include rock, debris (coarse material), and earth (fine material). For example, rock falls are landslides consisting of rock with a falling type of movement, debris slide consist of coarse material with a sliding type movement, and earth flows consist of fine material with a flow type of movement. The most common landslides in Utah include rock falls, rock topples, debris slides, debris flows, earth slides, and earth flows.

Rock falls and topples are downslope movements of loosened blocks or boulders from a bedrock area. Rock falls and topples generally occur along steep canyons with cliffs, deeply incised stream channels in bedrock, and steep bedrock road cuts. The greatest damage from rock falls has been to roads, railroads, and above-ground pipelines. Wildfire

A wildfire is an uncontrolled fire spreading through vegetative fuel often exposing or consuming structures. Wildfires often begin unnoticed and spread quickly and are usually sighted by defense smoke. Wildfires are placed into two classifications Wildland and Wildland Urban Interface. Wildland fires are those occurring in an area where development is essentially nonexistence, except for roads, railroads, or power lines. A WUI fire is a wildfire in a geographical area where structures and other human development meet or intermingle with wildland or vegetative fuels.

Severe Weather

Lightening

Lightening is a giant spark of electricity that occurs between the positive and negative charges within the atmosphere or between the atmosphere and the ground.

Downbursts

A downburst is a severe localized wind, blasting from a thunderstorm. Depending on the size and location of these events, the destruction to property may be devastating. Downbursts fall into two categories by size. Microbursts cover an area less than 2.5 miles in diameter. Microbursts cover an area with a diameter larger than 2.5 miles.

Heavy snowstorms

A severe winter storm deposits four or more inches of snow during a 12-hour period or six inches of snow during a 24-hour period. According to the official definition given by the U.S. Weather Service, the winds must exceed 35 miles per hour and the temperature must drop 20 degrees Fahrenheit or lower. All winter storms make driving extremely dangerous.

Blizzards

A blizzard is a snowstorm with sustained winds of 40 miles per hour or more or gusting winds up to at least 50 mph with heavy falling or blowing snow, persisting for one hour or more, temperatures of ten degrees Fahrenheit or colder and potentially life-threatening travel conditions. The definition includes the conditions under which dry snow, which has previously fallen, is whipped into the air and creates a diminution of visual range.

Hail Storms

Hailstones are large pieces of ice that fall from powerful thunderstorms. Hail forms when strong updrafts within, the convection cell of a cumulonimbus cloud carries water droplets upward causing them to freeze. Once the droplet freezes, it collides with other liquid droplets that freeze on contact. These rise and fall cycles continue until the hailstone becomes too heavy and falls from the cloud.

Drought

Drought is a normal recurrent feature of climate, although many, in Utah, erroneously consider it a rare and random event. It occurs in virtually all-climatic zones, while its characteristics vary significantly from one region to another. Droughts, simple put, are cumulative hazards, which result from long periods of below normal precipitation. Drought is a temporary aberration and differs from aridity since the latter is restricted to low rainfall regions and is a permanent feature of climate.

For the most part droughts no longer affect the availability of drinking water, thus no longer place people's lives at risk, the same cannot be said for a person's livelihood. Numerous water projects throughout the state have placed enough water in storage to insure drinking water. Prolonged droughts have a significant effect on agricultural and agribusinesses, within the state dependent on irrigation water. Droughts also stress wildlife, and heighten the risk of wildfire.

Tornados and High Winds

According to the National Oceanic and Atmospheric Administration, a tornado is defined as a violently rotating column of air extending from a thunderstorm to the ground. While there have not been many destructive tornados in Utah's history, several have caused damages and casualties.

Dam Failure

Dam failures result from the failure of a man made water impoundment structure, which often results in catastrophic down grade flooding. The Utah State Engineer has been charged with regulating non-federal dams in the State dams since 1919

Plan Maintenance Procedures

Monitoring, Evaluating and Updating the Plan

Periodic monitoring and reporting of the plan is required to ensure that the goals and objectives for the Six County Region are kept current and that local mitigation efforts are being carried out. The plan has therefore been designed to be user-friendly in terms of monitoring implementation and preparing regular progress reports.

Annual Reporting Procedures

The plan shall be reviewed annually, as required by the SCAOG Executive Board, or as situations dictate such as following a disaster declaration. Each year the SCAOG Planning and Community Development Department Staff will review the plan and ensure the following:

1. The Executive Director and the SCAOG Executive Board will receive an annual report and/or presentation on the implementation status of the plan at the January Executive Board Meeting which is open to the public.
2. The report will include an evaluation of the effectiveness and appropriateness of the mitigation actions proposed in the plan.
3. The report will recommend, as appropriate, any required changes or amendments to the plan.

If the SCAOG Executive Board determines that a modification of the plan is warranted, the Board may initiate a plan amendment.

Revisions and Updates

Periodic revisions and updates of the Plan are required to ensure that the goals and objectives for the Six County Region are kept current. More importantly, revisions may be necessary to ensure the plan is in full compliance with Federal regulations and State statutes. This portion of the plan outlines the procedures for completing such revisions and updates.

Five (5) Year Plan Review

Based on funding, the entire plan including any background studies and analysis should be reviewed every five (5) years to determine if there have been any significant changes in the Six County Region that would affect the plan. Increased development, increased exposure to certain hazards, the development of new mitigation capabilities or techniques and changes to Federal or State legislation are examples of changes that may affect the condition of the plan. The local elected officials in the Six County area will be consulted in the five (5) year review/update process. Typically, the same process that was used to create the original plan will be used to prepare the update. Each community will hold public meetings to gain input on how the plan should be updated. The requirements of the mitigation plan will be incorporated into the Six County AOG Consolidated plan including FEMA mitigation projects as part of the Six County Capital Improvements List.

Further, following a disaster declaration, the plan will need to be revised to reflect on lessons learned or to address specific circumstances arising out of the disaster.

The results of this five (5) year review should become summarized in the annual report prepared for this plan under the direction of the Planning and Community Development Director. The annual report will include an evaluation of the effectiveness and appropriateness of the plan, and will recommend, as appropriate, any required changes or amendments to the plan.

If the SCAOG Executive Board, local jurisdiction, Division of Emergency Management, or FEMA determines that the recommendations warrant modification to the Plan, the Board may either initiate a plan amendment as described below, or, if conditions justify, may direct the SCAOG Community and Economic Development Department to undertake a complete update of the plan.

Plan Amendments

An amendment to the plan should be initiated only by the SCAOG Executive Board, either at its own initiative or upon the recommendation of the Executive Director, Planning and Community Development Director or Mayor of an affected community.

Upon initiation of an amendment to the plan, SCAOG will forward information on the proposed amendment to all interested parties including, but not limited to, all affected city or county departments, residents and businesses. At a minimum, the information will be made available through public notice in a newspaper of general circulation and on the SCAOG website at <http://www.sixcounty.com/>. Information will also be forwarded to the Utah Department of Public Safety, Utah Division of Emergency Management. This information will be sent out in order to seek input on the proposed plan amendment for not less than a forty-five (45) day review and comment period.

At the end of the comment period, the proposed amendment and all review comments will be forwarded to the Executive Director or designee for consideration. If no comments are received from the reviewing parties within the specified review period, such will be noted accordingly. The Executive Director or designee will review the proposed amendment along with comments received from other parties and submit a recommendation to the SCAOG Executive Board within sixty (60) days.

In determining whether to recommend approval or denial of a Plan amendment request, the following factors will be considered:

1. There are errors or omissions made in the identification of issues or needs during the preparation of the plan; and/or
2. New issues or needs have been identified which were not adequately addressed in the plan; and/or

3. There has been a change in information, data or assumptions from those on which the plan was based.
4. The nature or magnitude of risks has changed.
5. There are implementation problems, such as technical, political, legal or coordination issues with other agencies.

Upon receiving the recommendation of the Executive Director or designee, the SCAOG Executive Board will hold a public hearing. The SCAOG Executive Board will review the recommendation (including the factors listed above) and any oral or written comments received at the public hearing. Following that review, the SCAOG Executive Board will take one of the following actions:

1. Adopt the proposed amendment as presented.
2. Adopt the proposed amendment with modifications.
3. Refer the amendment request back to the Executive Director for further consideration.
4. Defer the amendment request for further consideration and/or hearing.
6. Reject the amendment request.

Implementation through Existing Programs

Process

The Six County Association of Governments Pre-Disaster Hazard Mitigation Plan will be implemented through the Capital Improvement Plans (CIP), general plans, and zoning ordinances of each local jurisdiction. In addition, counties should involve their emergency managers in joining the NFIP if necessary, and in their storm water planning. It will be the responsibility of Mayor/Council/Commissioner(s) of each jurisdiction, as they see fit, to ensure these actions are carried out no later than the target dates unless reasonable circumstances prevent their implementation (i.e. lack of funding availability).

Funding Sources

Although all mitigation techniques will likely save money by avoiding losses, many projects are costly to implement. The Six County jurisdictions will continue to seek outside funding assistance for mitigation projects in both the pre- and post-disaster environment. This portion of the Plan identifies the primary Federal and State grant programs for Six County jurisdictions to consider, and also briefly discusses local and non-governmental funding sources.

Federal

The following federal grant programs have been identified as funding sources which specifically target hazard mitigation projects:

Title: Pre-Disaster Mitigation Program

Agency: Federal Emergency Management Agency

Through the Disaster Mitigation Act of 2000, Congress approved the creation of a national program to provide a funding mechanism that is not dependent on a Presidential Disaster Declaration. The Pre-Disaster Mitigation (PDM) program provides funding to states and communities for cost-effective hazard mitigation activities that complement a comprehensive mitigation program and reduce injuries, loss of life, and damage and destruction of property.

The funding is based upon a 75% Federal share and 25% non-Federal share. The non-Federal match can be fully in-kind or cash, or a combination. Special accommodations will be made for “small and impoverished communities”, who will be eligible for 90% Federal share/10% non-Federal.

FEMA provides PDM grants to states that, in turn, can provide sub-grants to local governments for accomplishing the following eligible mitigation activities:

- < State and local hazard mitigation planning
- < Technical assistance (e.g. risk assessments, project development)
- < Mitigation Projects
- < Acquisition or relocation of vulnerable properties
- < Hazard retrofits
- < Minor structural hazard control or protection projects
- < Community outreach and education (up to 10% of State allocation)

Title: Flood Mitigation Assistance Program

Agency: Federal Emergency Management Agency

FEMA’s Flood Mitigation Assistance program (FMA) provides funding to assist states and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes and other structures insurable under the National Flood Insurance Program (NFIP). FMA was created as part of the National Flood Insurance Reform Act of 1994 (42 USC 4101) with the goal of reducing or eliminating claims under the NFIP.

FMA is a pre-disaster grant program, and is available to states on an annual basis. This funding is available for mitigation planning and implementation of mitigation measures only, and is based upon a 75% Federal share/25% non-Federal share. States administer the FMA program and are responsible for selecting projects for funding from the applications submitted by all communities within the state. The state then forwards selected applications to FEMA for an eligibility determination. Although individuals cannot apply directly for FMA funds, their local government may submit an application on their behalf.

Title: Hazard Mitigation Grant Program

Agency: Federal Emergency Management Agency

The Hazard Mitigation Grant Program (HMGP) was created in November 1988 through Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. The HMGP assists states and local communities in implementing long-term mitigation measures following a Presidential disaster declaration.

To meet these objectives, FEMA can fund up to 75% of the eligible costs of each project. The state or local cost-share match does not need to be cash; in-kind services or materials may also be used. With the passage of the Hazard Mitigation and Relocation Assistance Act of 1993, federal funding under the HMGP is now based on 15% of the federal funds spent on the Public and Individual Assistance programs (minus administrative expenses) for each disaster.

The HMGP can be used to fund projects to protect either public or private property, so long as the projects in question fit within the state and local governments overall mitigation strategy for the disaster area, and comply with program guidelines. Examples of projects that may be funded include the acquisition or relocation of structures from hazard-prone areas, the retrofitting of existing structures to protect them from future damages; and the development of state or local standards designed to protect buildings from future damages.

Eligibility for funding under the HMGP is limited to state and local governments, certain private nonprofit organizations or institutions that serve a public function, Indian tribes and authorized tribal organizations. These organizations must apply for HMPG project funding on behalf of their citizens. In turn, applicants must work through their state, since the state is responsible for setting priorities for funding and administering the program.

Title: Public Assistance (Infrastructure) Program, Section 406

Agency: Federal Emergency Management Agency

FEMA's Public Assistance Program, through Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, provides funding to local governments following a Presidential Disaster Declaration for mitigation measures in conjunction with the repair of damaged public facilities and infrastructure. The mitigation measures must be related to eligible disaster related damages and must directly reduce the potential for future, similar disaster damages to the eligible facility. These opportunities usually present themselves during the repair/replacement efforts.

Proposed projects must be approved by FEMA prior to funding. They will be evaluated for cost effectiveness, technical feasibility and compliance with statutory, regulatory and executive order requirements. In addition, the evaluation must ensure that the mitigation measures do not negatively impact a facility's operation or risk from another hazard.

Public facilities are operated by state and local governments, Indian tribes or authorized tribal organizations and include:

- < Roads, bridges & culverts
- < Draining & irrigation channels
- < Schools, city halls & other buildings
- < Water, power & sanitary systems
- < Airports & parks

Private nonprofit organizations are groups that own or operate facilities that provide services otherwise performed by a government agency and include, but are not limited to the following:

- < Universities and other schools
- < Hospitals & clinics
- < Volunteer fire & ambulance
- < Power cooperatives & other utilities
- < Custodial care & retirement facilities
- < Museums & community centers

Title: SBA Disaster Assistance Program

Agency: US Small Business Administration

The SBA Disaster Assistance Program provides low-interest loans to businesses following a Presidential disaster declaration. The loans target businesses to repair or replace uninsured disaster damages to property owned by the business, including real estate, machinery and equipment, inventory and supplies. Businesses of any size are eligible, along with non-profit organizations.

Their recipients to incorporate mitigation techniques into the repair and restoration of their business can utilize SBA loans.

Title: Community Development Block Grants

Agency: US Department of Housing and Urban Development

The Community Development Block Grant (CDBG) program provides grants to local governments for community and economic development projects that primarily benefit low- and moderate-income people. The CDBG program also provides grants for post-disaster hazard mitigation and recovery following a Presidential disaster declaration. Funds can be used for activities such as acquisition, rehabilitation or reconstruction of damaged properties and facilities and for the redevelopment of disaster areas.

State Programs

The Permanent Community Impact Fund Board (CIB) provides grants and loans to eligible entities in areas impacted by mineral extraction on federal lands. Counties, municipalities, school districts, and other subdivisions of the state are eligible.

Local

Local governments depend upon local property taxes as their primary source of revenue. These taxes are typically used to finance services that must be available and delivered on a routine and regular basis to the general public. If local budgets allow, these funds are used to match Federal or State grant programs when required for large-scale projects.

Non-Governmental

Another potential source of revenue for implementing local mitigation projects are monetary contributions from non-governmental organizations, such as private sector companies, churches, charities, community relief funds, Red Cross, hospitals, Land Trusts and other non-profit organizations.

Paramount to having a plan deemed to be valid is its implementation. There is currently no new fiscal note attached to the implementation of this Plan.

Continued Public Involvement

Throughout the planning process, public involvement has been and will be critical to the development of the Plan and its updates. On a yearly basis the plan will be profiled during the meetings with each jurisdiction, i.e., the county commissioners and elected officials in the Six County Region to which the public is invited. The plan will also be available on the Six County website (<http://www.sixcounty.com/>) to provide additional opportunities for public participation and comment.

Six County Association of Governments staff has been designated by its Executive Board in preparing and submitting the *Six County Pre-Disaster Mitigation Plan*, which includes coverage for all incorporated cities and counties within the Six County Region, i.e., Juab, Millard, Piute, Sanpete, Sevier and Wayne Counties. The strategy of the Six County Association of Governments in preparing the plan is to use available resources in the most efficient and cost effective manner to allow its cities/towns and counties continued access to data, technical planning assistance and FEMA eligibility. In addition, the SCAOG will reach out to non-profits, public agencies, special needs organizations, groups and individuals in allowing them input and access to the plan. With limited resources, however, it becomes difficult to both identify and to individually contact the broad range of potential clients that may stand to benefit from the plan. This being the case, we have established the following course of action:

STEP 1.

The SCAOG will publicly advertise all hearings, requests for input and meetings directly related to the Pre-Disaster Hazard Mitigation Plan process. SCAOG Executive Board meetings where plan items are discussed and where actions are taken will not receive special notifications as they are already advertised according to set standards. All interested parties are welcome and invited to attend such meetings and hearings, as they are public and open to all. Advertisement will be done according to the pattern set in previous years, i.e. the SCAOG will advertise each hearing and request for input at least seven days (7) in advance of the activity and will publish notices of the event in the newspapers of general circulation. The notices will advertise both the hearing and the means of providing input outside the hearing if an interested person is unable to attend.

STEP 2.

The SCAOG has established a mailing list of many local agencies and individuals that may have an interest in the Pre-Disaster Hazard Mitigation Plan. Each identified agency or person will be mailed a notice of the hearings and open houses.

STEP 3.

Comments, both oral and written, will be solicited and accepted from any interested party. Comments, as far as possible, will be included in the final draft of the Hazard Mitigation Plan; however, the SCAOG reserves the right to limit comments that are excessively long due to the size of the Plan.

STEP 4.

Specific to risk assessment and hazard mitigation, needs analysis, and capital investment strategies, the SCAOG will make initial contact and solicitation for input from each incorporated jurisdiction within the region. All input is voluntary. Staff time and resources do not allow personal contact with other agencies or groups, however, comments and strategies are welcomed as input to the planning process from any party via regular mail, FAX, e-mail, phone call, etc. In addition, every public jurisdiction advertises and conducts public hearings on their planning, budget, etc. where most of these mitigation projects are initiated. Input can be received from these prime sources by the region as well.

STEP 5.

The final draft of the Hazard Mitigation Plan will be presented to the SCAOG Executive Board at its regularly scheduled monthly meeting for adoption and approval to submit the document to State authorities. Executive Board policies on adoption or approval of items will be in force and adhered to. This document is intended to be flexible and in constant change so comments can be taken at any time of the year for consideration and inclusion in the next update. Additionally, after FEMA approval of the Plan, the Plan will be promulgated for each local jurisdiction for adoption by resolution.

STEP 6.

The following policies will guide SCAOG staff in making access and input to the Hazard Mitigation Plan as open and convenient as possible:

- A. Participation: All citizens of the region are encouraged to participate in the planning process, especially those who may reside within identified hazard areas. The SCAOG will take whatever actions possible to accommodate special needs of individuals including the impaired, non-English speaking, persons of limited mobility, etc.
- B. Access to Meetings: Adequate and timely notification to all area residents will be given as outlined above to all hearings, forums, and meetings.
- C. Access to Information: Citizens, public jurisdictions, agencies and other interested parties will have the opportunity to receive information and submit comments on any aspect of the Hazard Mitigation Plan, and/or any other documents prepared for distribution by the Six County Association of Governments that may be adopted as part

of the plan by reference. The SCAOG may charge a nominal fee for printing of documents that are longer than three pages.

D. Technical Assistance: Residents as well as local jurisdictions may request assistance in accessing the program and interpretation of mitigation projects. SCAOG staff will assist to the extent practical, however, limited staff time and resources may prohibit staff from giving all the assistance requested. The SCAOG will be the sole determiner of the amount of assistance given all requests.

E. Public Hearings: The SCAOG will plan and hold public hearings according to the following priorities: 1- Hearings will be conveniently timed for people who might benefit most from Mitigation programs, 2- Hearings will be accessible to people with disabilities (accommodations must be requested in advance according to previously established policy), 3- Hearings will be adequately publicized. Hearings may be held for a number of purposes or functions including to: a-identify and profile hazards, b-develop mitigation strategies, and c-review plan goals, performance, and future plans.

F. Comment Period: The SCAOG will sponsor a 30-day public comment period prior to final plan submission. The comment period will begin with a public hearing to open the 30-day solicitation of input. Comments may be made orally, or in writing, and as far as possible, will be included in the final Six County Pre-Disaster Hazard Mitigation Plan according to the outlined participation rules.

Six County Regional Risk Assessment

Drought and severe weather hazards are assessed below. All other hazards are discussed in the county discussions.

Drought in the Six County Region

History of Drought in Six County Region

Utah has currently been in a Statewide drought since 2012. This means that there has been below normal precipitation and snowfall accumulations. The region has a history of drought, since recorded. In early history, from 1896-1905 the drought affected cattle grazing operations. The “Dust Bowl Years” from 1924-1936 also decreased agricultural productivity to almost half of prior years’ production. In the mid 1970’s the State faced a Federal Disaster Declaration Drought. There was a \$132 million loss (in 2005 dollars) due to drought impacts. Between 1986 and 1992 there was another state-wide drought. In 1988 this was nationally the most costly natural catastrophe in U.S. history. Almost a decade later between 1999-2004 Statewide reservoir capacities plunged below 50% affecting ranching and farming in the region (State Hazard Assessment 2014)

Drought Assessment for the Six County Region

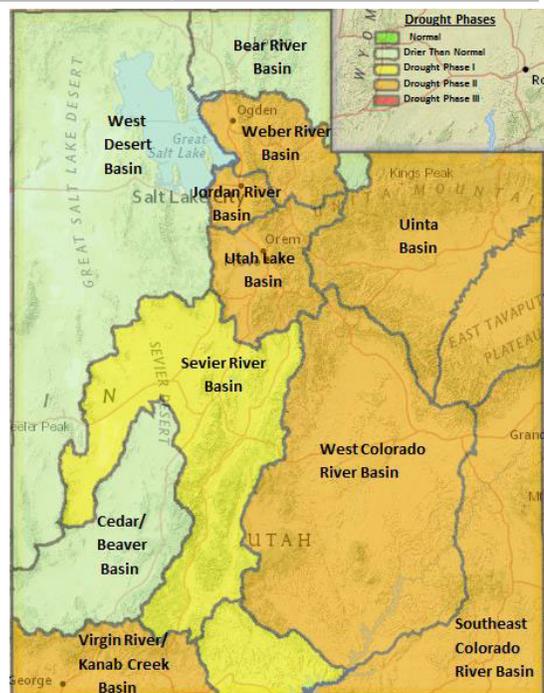
Table 1-11: Drought Hazard Profile

Frequency	Common
Severity	Moderate, depends on year
Location	Region-wide
Seasonal Patterns	Biggest impact in Summer
Duration	One to several years
Speed of Onset	Staggered Event
Probability of Future Occurrences	Highly Likely: 90 to 10 percent probability of occurrence in the next year or a recurrence interval of less than 1 year

According to Adam Allgood of the Climate Prediction Center of the NOAA, drought is expected to persist or intensify.

Wayne and Piute are expected to have very low impacts based on agricultural activities. Even so, Piute has one of the highest values for per capita agricultural losses in the state from a drought at \$82,734.

Millard and Sanpete are expected to have high impacts from drought based on agricultural activities. Millard also has a high potential per capita agricultural loss for drought at \$54,338.



Juab and Sevier are expected to have moderate impacts based on agricultural activities. (Utah State Hazard Mitigation Plan 2014).

According to the DEM score, the Sevier River Basin is in Drought Phase I—or the Dry Conditions Begin to threaten water shortages. The West Colorado River Basin which covers Wayne and Sanpete Counties are in Drought Phase II: Water shortages are likely. See map on the right for more information.

Severe Weather in the Six County Region

History of Severe Weather in Six County Region

Winter weather is the most expensive form of Severe Weather in the Six County Region. From 1960-2013 winter weather has caused damage to crops and property costing a total of \$30,798,828 (ADJ 2013). There have also been 104 injuries and 4 fatalities from winter weather. This is according to SHEL DUS (Spatial Hazard Events and Loss Data in the United States).

In **Juab County** this has been a total cost of \$7,110,949 with 29 injuries and 3 fatalities. Winter weather hazard loss has added up to be \$6,119,628 with 36 injuries and 1 fatality in **Millard County**. **Piute County** has experienced a total loss of \$3,295,802 from winter weather hazards. There have been a total of 8 injuries and no fatalities recorded. **Sanpete County** has had \$6,205,532 in severe winter weather hazard losses. There have been 17 total injuries and 2 deaths. **Sevier County** has had \$4,837,164 in severe weather hazard losses. There have been 8 injuries and no fatalities. **Wayne County** has had \$3,229,753 in severe weather hazard losses. There have been 8 injuries and no fatalities.

Wind Damage is the most cited severe weather problem in the interviews with the communities of Six County AOG, but it is not as high as winter weather loss. There has been a total of \$6,666,694 lost due to strong winds including microbursts. Tornadoes are considered uncommon in the region, but have cost \$2,741,448. Severe storm has had a total loss of \$2,758,194.

Fog, hail, and lightning have had negligible costs over the past 55 years, although lightning has caused 3 fatalities and has been the start of wildfires which have created a larger extent of hazard loss.

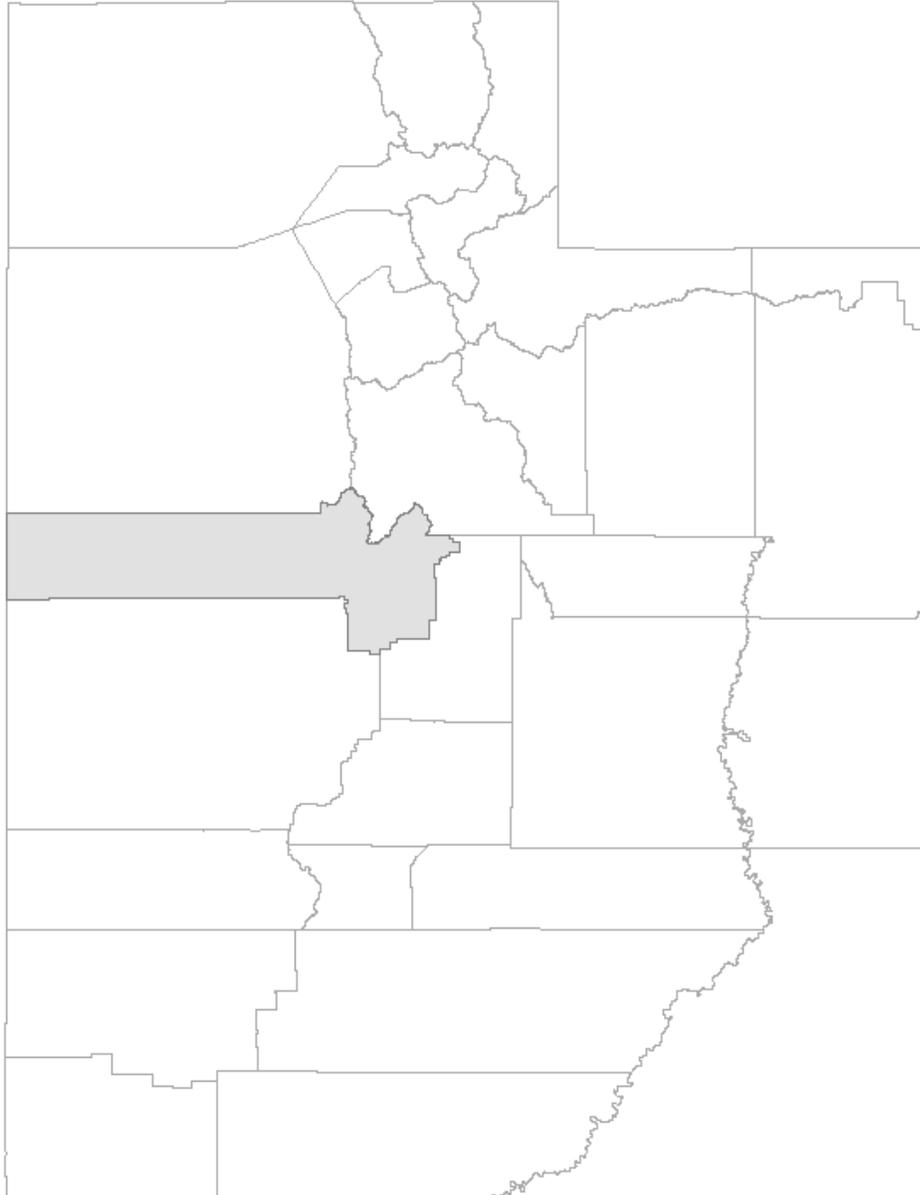
Severe Weather Assessment for the Six County Region

Frequency	Uncommon but seasonal
Severity	Moderate, depends on year
Location	Region-wide
Seasonal Patterns	Winter, Spring
Duration	Instant
Speed of Onset	Immediately
Probability of Future Occurrences	Occasional: 1 to 10 percent probability of occurrence in the next year or a recurrence interval of 11 to 100 years.

The Utah Division of Emergency Management in the state-wide Pre-Disaster Mitigation Plan 2014 Update gave the following rankings to the counties of SCAOG in terms of severe weather vulnerability on a 1-13 ranking system: 9- Juab; 12- Millard; 10- Piute; 11- Sanpete; 12- Sevier; 13- Wayne. Overall the region is not considered to have a high threat from Severe Weather. This is due to the low population and density of the area.

Juab County

Natural Hazard Assessment for Pre-Disaster Mitigation



Prepared by: Chelsea Bakaitis, Six County AOG Planning Division

Contents

Introduction.....	1
Background Information.....	1
Capability Assessment.....	2
Juab County Agencies.....	2
Levan Town.....	2
Nephi City.....	2
Critical Facilities.....	3
Juab County Flooding.....	5
History of Flooding in Juab County:.....	5
Flood Assessment for Juab County.....	6
Juab County Wildfires.....	9
History of Wildfires in Juab County.....	9
Wildfire Assessment for Juab County.....	9
Juab County Landslides.....	13
History of Landslides in Juab County.....	13
Landslide Assessment for Juab County.....	14
Juab County Earthquakes.....	15
History of Earthquakes in Juab County.....	15
Earthquake Assessment for Juab County.....	15
Juab County Dam Failure.....	17
History of Dam Failure in Juab County.....	17
Dam Failure Assessment for Juab County.....	17
APPENDIX I: COUNTY CAPABILITIES.....	i
APPENDIX II: COMMUNITY CAPABILITIES.....	xi
Nephi City Capability Assessment.....	xi
Levan Town Capability Assessment.....	xiii
APPENDIX III: OTHER AGENCY RESOURCES.....	xvi
APPENDIX IV: 100- YEAR FLOODPLAIN MAP.....	xvii

Introduction

This document is an overview of natural hazards in Juab County. It tells about the history of hazards in the county and defines present and future projected risks. It serves as an annex of the general SCAOG Regional Pre-Disaster Mitigation Plan and is divided into sections covering the following hazard topics: flooding, wildfires, landslides, earthquakes, and dam failure. Each section contains information about the history of the hazard, and an assessment of the extent and location of the hazard. Juab County Emergency Manager, Captain Fred Smalley with the Juab Sherriff's department was contacted for information about the county's hazard planning. Lieutenant Brent Pulver took over this position during the planning process and also assisted with assessment and mitigation efforts. All municipalities were contacted for information about hazards in their area. They were asked to provide mitigation goals and strategies for their community to implement

Background Information

Juab County is located in central Utah, and extends from the center of the state to the Utah-Nevada border. The county is surrounded by Tooele, Utah, Sanpete, and Millard Counties.

The largest city of Juab County, Nephi, had its start in agriculture, which still plays an important part in the economy of the city and the county. Nephi is located approximately halfway between Salt Lake City and Fillmore. The Interstate 15 corridor is where future development is likely to happen because of the private lands along this major transportation artery.

Juab County comprises of 2,171,438 acres. Approximately 374,653 acres or 17% of the total land area in Juab County is privately held and outside the incorporated areas is almost entirely vacant. American Indian Trust land accounts for 2% of ownership. The other 81% is owned by the state or federal governments and aside from extractive industry is beyond the reach of development. Less than 1% of the county's land area is developed, and 4% is agricultural.

The vast majority of natural hazards occur on these public lands with virtually no impact on development. Other limitations to development include steepness of the terrain, flash flood plains and accessibility.

There is infill within city limits that can be utilized for safe development without developing in unincorporated, sparsely populated, or hazardous areas.

Juab County requires International Building Code (IBC) on all new or proposed

buildings. New subdivisions require a grading and drainage plan to mitigate any flooding, which may occur. Most privately held land and new developments are along the relatively safe and accessible I-15 corridor.

Figure 2-1: Participating Juab County Jurisdictions

- Juab County
- Mona City
- Levan Town
- Nephi City
- Rocky Ridge Town
- Eureka City

Capability Assessment

A capability assessment looks at “safeguards” that jurisdictions have in place to prevent or mitigate disasters. These measures include: planning and regulatory policies, administrative and technical roles, tax and funding resources, and educational/outreach programs.

Juab County Agencies

Juab County has several different agencies which support mitigation actions. The Emergency Management of the county helps coordinate mitigation and risk reduction. This group also works with Six County AOG in the making of the mitigation plan. The County Highway Department also works to mitigate risk by making sure roadways are properly maintained with proper equipment to prevent flooding and overflow. Central Utah Public Health acts as a state agency but assists with preventing health hazards in the case of a disaster. The County Sheriff’s Department is responsible for law enforcement in unincorporated areas and smaller towns without departments. It works with the Juab County Fire District in being a response to emergencies. Educational outreach is provided by the Utah State University Extension Service. It provides agricultural and environmental information in dealing with drought and winter storms. It coordinates with Juab Emergency Management and Public Health. A more detailed list of agencies and their roles can be found in Appendix I.

Levan Town

The zoning and subdivision ordinance for Levan Town are considered by the communities as effective measures for reducing hazard impacts. The town also has separate natural hazard specific ordinances. Since the town is small, most administrative positions that deal with disaster mitigation are delegated to the county. Funding sources for mitigation projects come from federal and state programs as well as local taxes. The local Community Emergency Response Team (CERT) and a community church group holds emergency preparedness classes for the public. For more information please see Appendix II.

Nephi City

Hazards are addressed the Nephi City 2011 General Plan. Although this plan does not identify mitigation projects the plan can be used to implement mitigation actions. Annually the city updates its Capital Improvement Plan, which plans specific projects for mitigation. For example, recently a capital improvements drainage facilities project was completed. The city also has a local emergency operations plan that was originally approved in the 1980’s, but has been recently updated. Ordinances and codes also work to reduce the impact of hazard, as do ongoing efforts to reach out to the public to provide general information about hazards. For more information please see Appendix II.

No capability information was received from the listed municipalities:

- Eureka City
- Mona Town
- Rocky Ridge Town

Critical Facilities

Critical facilities are given special consideration when planning mitigation projects: They are the activities and facilities that even a slight chance of a hazard is a great threat. Critical facilities include hospitals, fire stations, police stations, critical records, water treatment, and other similar facilities. Juab County and each of its community were asked to list their critical facilities and define what natural hazards pose the greatest risk to each facility. The following charts outline information given by the municipalities of their critical facilities and what natural hazards posed the greatest threat to these facilities.

Table 2-2: Juab County Critical Facilities			
Critical Facilities	Greatest Risk	History of Damage	
Mona Town Critical Facilities			
Water Tank	Flood	None	
Water Treatment Facility	Earthquake		
Water Distribution Lines	Fire		
Sewage Treatment Plan			
City Building			
Nephi City Critical Facilities			
Central Valley Medical Center	Earthquake	Water transmission lines in Salt Creek Canyon washed out in 1983 flood	
Nephi Fire Station	Flood		
Nephi Ambulance Building	Fire		
Juab County Court House	Extreme weather		
Nephi City Hall	Landslide		
Juab School District	Severe		
Nephi City Water Storage Tanks And Chlorinator	wind		
Nephi City Electric Substation	Lightning		
Nephi City Natural Gas Gate Stations			
Nephi City Water Transmission Lines			
Juab Rural Development Agency Gas Main			
Miller Canyon Debris Dam			
Salt Creek Canyon Debris Dams			
Rocky Ridge Town Critical Facilities			
Fire Station	Earthquake		None
Water Tank	Fire		
Pump Station			
Eureka Town Critical Facilities			
Town Hall		Flooding	

Levan Town Critical Facilities		
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Town Hall		
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Juab County Flooding

Areas in Juab County have experienced significant impacts related to flooding in recent recorded history. Juab County has several reservoirs and deltas that make adjacent communities prone to flooding. The Sevier River is the only river that goes through Juab. It connects with the Yuba Lake Reservoir and is controlled by the Sevier Bridge Dam. The Mona Dam protects area around the Mona reservoir from significant flooding. The City of Nephi is built on the alluvial fan of water run-down from Salt Creek. Homes in the foothills frequently experience flooding. Floods are also common in the city of Levan, occurring from water runoff from the mountains to the east. Flooding can also take place with some landslide events, particularly sediment/mud/debris flows resulting from a wildfire burn scar.

History of Flooding in Juab County:

In terms of property damage and disruption of community life the cities along the Wasatch Mountains of Mona, Nephi, and Levan have been the most impacted by flooding. Salt Creek Canyon floods two to three times every year. Many of these small incidences are not noted in the chart. The following is a summary of significant flooding events:

Date	Location	Critical Facility or Area Impacted
1935	Nephi	Damaging Flash Flood
July 31, 1936	Eureka/Tintic	Considerable flood damage to roads and streets. Mud covered rail tracks.
August 10, 1941	Mona/Jericho	Damaged railroad tracks, property and road network
July 21, 1943	Nephi; Salt Creek Canyon	Property, roads, and bridges damaged
1952	Nephi	Damaging Flash Flood
August 15, 1955	Nephi; Bigelow Canyon Cloudburst	Business establishments, farms and irrigation ditches. 7,000 turkeys were killed.
1956	Nephi	Damaging Flash Flood
August 4 1961	Jericho, Nephi, and Eureka	Utah Highways 11, 36, and 132 and U.S. 6 covered with water and debris.
July 18, 1964	Eureka	Homes and streets; considered worst storm in many years
July 22, 1968	Tintic	Homes, roads, electric, and telephone lines.
August 2, 1968	Levan; Pigeon Creek Canyon	City streets and irrigation ditches; over \$15,000 in damages
1983 & 1984	Nephi	Minor flooding along Big Hollow from large snowpack melting in the Salt Creek Watershed.
1984	County Wide	Creek channels filled with sediment, damaged bridges, culverts, roads, water lines; presidentially declared disaster; Public assistance total \$1,310,566

2001/2	Nephi	Nebo Fire Flood
July/Aug 2007	Salt Creek Canyon	Caused by the Salt Creek Fire
July 29, 2014	Levan	State Route 28 blocked. Hwy 132. Fire Debris brought into town; caused by flash floods off of burn scar. Recurring flooding.
Sources: Nephi Watershed Protection & Storm Drainage Master Plan, June 2009; Hazard Assessment Meeting with Communities; USACE Flood Hazard Identification Study for SCAOG, Aug 2003, Flood Insurance Study, City of Eureka, Utah, Dec 2007.		

Flood Assessment for Juab County

Table 2-4: Hazard Profile for Flooding in Juab County	
Severity	Limited
Location	Flooding would occur in and along flood plains. Also off of burn scars.
Seasonal Pattern	Snowmelt runoff during spring months. Summer wildfire burn scars also pose a risk to flooding.
Duration	The type of event determines the duration of flooding; flooding due to summer thunderstorms can last a couple of hours whereas flooding due to spring runoff can last weeks.
Speed of Onset	Six to twelve hours.
Probability of Future Occurrences	<i>Likely:</i> 10 to 90 percent prob. Of occurrence in next year or a recurrence interval of 1 to 10 years.
Source: Based on assessment created by jurisdiction.	

Location and Extent

Taken as a whole, Juab County has a relatively limited flood threat, although for many of the communities flooding happens every year. The municipalities of Eureka, Nephi, and Levan are the three out of the five communities in Juab that are a part of the National Flood Insurance Program (NFIP). Mona and Rocky Ridge Towns do not participate.

Given existing and potential future development, areas around Salt Creek Canyon are most likely to see impacts related to flooding. At present most of the risk for flood damage is centered on potential agriculture and rangeland losses. Although homes in these areas have been damaged. As more development occurs, if it is not properly managed, threats to structures and human safety will certainly increase.

An August 2003 report titled Flood Hazard Mitigation Study of the Six County Association of Governments by the U.S. Army Corps of Engineers was completed to help communities without floodplain data. This study generally identified areas of concern for municipalities and county. However, this report only intended to give communities very general estimates of where flood risk may exist.

In December 2007 a Flood Insurance Study was completed for **Eureka Town**. During this year separate Flood Insurance Rate Maps (FIRM) were created for the cities of **Nephi and Eureka**.

They are the only effective FIRMs in Juab County. There are Flood Hazard Boundary Maps for **Mona and Levan** but they have not been updated since 1977 and 1980 respectively and so are ineffective.

Floodplain maps were created by the Utah Division of Emergency Services. They used HAZUS, a loss estimation program, to create a 100-year flood plain with a 1% chance of flooding in any given year. These floodplain zones could pose a potential risk to residents and their property, and included in this analysis. For a map of floodplains along the Wasatch Range in Juab County please see Appendix IV.

Localized inundation occurs in **Eureka City** following high frequency rain events and snowmelt, due to inadequate storm water management system (U.S. Army Corps of Engineers, 2003). The Eureka Gulch flows through the center of the City of Eureka. Development, encroachment on the floodplain, and multiple stream crossings throughout the City of Eureka has compounded the flooding problem that the city faces (Eureka FIS, 2007). The city participates in the NFIP.

Levan Town participates in the NFIP. It is designated as a Special Flood Hazard Area (SFHA) by FEMA. It has experienced large flood events over the years. It is susceptible to flooding caused by mudslides from wildfire debris. Homes along Chicken and Pigeon Creek and at the mouth of these canyons are at a *likely* risk for high impact. Flooding in these areas have been common in the past few years, especially as result of vegetation loss from wildfires.

Mona City does not participate in the NIFP and does not have detailed floodplain data. There is a limited watershed east of town, but flood threat to Mona is minimal. Currant Creek flows on the west side of town into Mona reservoir, but these floodplains pose little threat since new development is not allowed to build adjacent to them (USACE, 2003).

Highway 132 goes through Salt Creek Canyon to **Nephi City**. The flood hazard in the canyon also poses a risk to the city. Nephi participates in the National Flood Insurance Plan (NFIP). In June 2009 the Nephi Watershed Protection & Storm Drainage Master Plan was published. It identifies recent problems with the growth in development in at-risk areas because of drainage deficiencies. These problem areas include development just east of the city affected by Salt Creek and the reach of Big Hollow, affected by snowmelt and cloudbursts. City officials ranked Nephi at a *likely* probability for a high impact flood. It is expected that in the case of a flood, 50% of the city would be affected. Several critical facilities are also at risk of a natural hazard. In the floods of 1983 a water transmission line in Salt Creek Canyon was washed out.

The town of **Rocky Ridge Town** does not participate in the NFIP. The community watershed is relatively small so the potential for catastrophic flooding is minimal. There exists the potential for a FEMA NSFHA designation. It appears that the east/west streets may have been intentionally located at the ends of these ravines to handle some storm water runoff. For the majority of the rainfall events, this will be adequate. A few homes near the mouths of the ravines may be at more substantial risk (USACE, 2003). The city rates their probability for risk at *unlikely*.

The **unincorporated portions of Juab County** have areas of flood-prone development. There has been mudslides caused by flooding up Salt Creek Canyon along SR 132. According to the report by USACE, the areas around Salt, Carrant, Tanner, and Cherry creeks (and their tributaries) are at threat for flooding. Mona reservoir is a high threat for flooding. According to the US Forest Service, in the areas that include Fishlake National Forest and the area administered by the Manti La-Sal National Forest flooding is likely because of water runoff from a wildfire burn scar or unusually large thunderstorms. It has caused road damage in some of these unincorporated areas in Juab. These areas are *likely and highly likely* to experience flooding.

Assessing Vulnerability: Addressing Repetitive Loss Properties

There are no repetitive loss properties in Juab County (FEMA, 2014).

Juab County Wildfires

History of Wildfires in Juab County

There were 1,790 reported fire starts in Juab County from 1973-2005. Most of these starts were in the eastern horn of the county, particularly along the I-15 and SR 6 and 132 corridors. To help address wildfire concerns, Juab County enacted a WUI ordinance in 1998 specifying fuel break distances for new construction not located within incorporated cities. According to the 2013 Annual Fire Report by the Richfield Interagency Fire Center, Juab County saw nine fires on state land which covered six and a half acres. On private land there were 13 fires that covered about 72 acres.

Table 2-5: Major Wildfires in Juab County 1996-2014

Date	Location	Critical Facility or Area Impacted	Comments
June 1996	Near Eureka		48,000 acres
August 1996	Leamington, at Utah-Juab county line		130,000 acres
1999	Sand Mountain Fire	Unknown	6,000 Acres
1999	Rail Road Fire, near Eureka	Unknown	61,000 Acres
2000	West Mona Fire	Unknown	6,692 Acres
2001-2007			Between these years there were fires in Oak City Canyon, Willow Canyon, Warm Springs, Deep Creek, Elk Pasture, Salt Creel
2007	Hwy 132	Closed Hwy 132	
2007	Salt Creek Fire	Main water line to Nephi Damaged	One home destroyed
2012			222 Fire
2014	Levan City, east side of Highway 28	2,425 acres, six homes in foothills endangered, \$2.6 million estimated cost, shut down SR 28	Six homes endangered, first wildfire in several years, homes along foothills in this area, created risk of mudslide and flash flooding

Source: Richfield Interagency Fire Center, Utah Forestry, Fire, and State Lands

Wildfire Assessment for Juab County

Table 2-7: Hazard Profile for Wildfire in Juab County

Severity	High in the Wildland Urban Interface
Location	Entire county except cultivated grounds and sand dunes.

Seasonal Pattern	Most wildfires affecting Juab County occur during mid to late summer months (fire season).	
Duration	The amount of time needed to contain a wildfire depends on a variety of uncontrollable variables such as: wind speed, relative humidity, type, and moisture content of fuel, weather, and topography. Thus containment time varies for each fire.	
Speed of Onset	0 to 6 hours is the minimum amount of time given to homeowners in order to evacuate.	
Probability of Future Occurrences	Eureka	Likely 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years.
	Levan	Occasional: 1 to 10 percent probability of occurrence in the next year or recurrence interval of 11 to 100 years.
	Mona	Occasional: 1 to 10 percent probability of occurrence in the next year or recurrence interval of 11 to 100 years.
	Nephi	Occasional: 1 to 10 percent probability of occurrence in the next year or recurrence interval of 11 to 100 years.
	Rocky Ridge	Occasional: 1 to 10 percent probability of occurrence in the next year or recurrence interval of 11 to 100 years.
*Based off of town's personal assessment and other data		

Location and Extent

The seven state-identified communities/areas at risk in Juab County are Eureka, Levan-East Bench, Mona-Willow/Mendenhall, Nephi-East Bench, Rocky Ridge, Sevier River Estate and Tintic Junction. Of these [communities], only Eureka and Rocky Ridge have completed a local Community Wildfire Protection Plan (CWPP) (Source: Central Utah Regional Wildfire Protection Plan, May 4, 2007).

Juab County is ranked 11th out of the 29 counties in the Division of Emergency Management wildfire risk assessment. Extreme and High Hazard Wildfire Areas make up 2,712 square miles. Many communities and private property are also at risk in these areas. A list of Regional Recommendations and Priorities may be found in the Central Utah Regional Wildfire Protection Plan, May 4, 2007 pages 4-18 to 4-23.

In 2010 the DEM estimated that there are 663 structures in high or extreme wildfire risk areas. Replacement costs and annual sales of commercial units costs a total of \$48,712,635. For more data about area vulnerability please see table below.

Most wildfires in Juab County occur in mid-late summer. Concerns regarding fire response capability as mentioned in the Juab County Mobilization Guide include:

- WUI areas (Wildland Urban Interface Areas, areas where homes are built near or among lands prone to wildland fire) around Eureka, Rocky Ridge, Levan, and other various locations throughout the county.

- Railroad rights-of-way along I-15 through Juab Valley, and rights-of-way extending along Highway 6/Highway 36. I-15, Highway 6, Highway 132, the West Desert area of Little Sahara, and Yuba Reservoir areas are highly influenced by people and are at higher risk for human-caused fires.
- Areas highly susceptible to lightning strikes include the mountains east and west of the Juab Valley, the Gilson Mountains, Tintic Valley and the area south of Levan.
- Cheat grass fuels in the mountains east and west of the Juab Valley, the Gilson Mountains, Tintic Valley and the area south of Levan and the West Desert allow fires to grow and spread rapidly.

Eureka Town is at an extreme overall risk of wildfire.

Levan is at a high risk for fire hazard, and according to a town assessment their power lines and springs above the town are at the greatest risk of fire damage. The city ranked impact from a fire to be high, although wildfire is uncommon in the municipality. Even so, fire in the mountains and hills above the city have stripped these areas of vegetation and has caused flooding.

Nephi City is also at a high risk for wildfire. In the community assessment, the city noted that potentially 20% of the jurisdiction could be affected by a wildfire. Although wildfires are common in the area, they generally cause only a moderate impact.

Rocky Ridge is also at a high risk for wildfire. City officials ranked the probability of a wildfire happening to be at 50%, although they have been uncommon in the past. Any impact a fire could have was ranked at a moderate level. Given the small size of the town, all of the jurisdiction is at risk for a wildfire hazard.

Unincorporated areas along the western Wasatch, Tintic, or Sanpitch mountain ranges are at moderate to high risk for wildfires. Areas of greatest concern in unincorporated Juab County are Callao and Trout Creek in the west desert (moderate fire risk), and Jericho along the Tintic range (extreme fire risk). Also of concern of high fire risk is land west of the Wasatch Range in between Nephi and Mona. Many possible structures spread across remote areas are also at risk.

Watersheds and other natural resources at risk. Watershed areas are of concern because of the potential for flooding, debris flow and degradation of municipal watershed water quality following wildland fire. Other natural resources at risk from wildfire could include range grazing lands and pinyon-juniper forest land (CWPP, 2007).

Community Name	Fire Occurrence*	Fuels Hazard	Values Protected	Fire Protection Capability	Overall Score*	Notes
Eureka	3	3	3	3	12	
Levan-East Bench	1	3	3	3	10	Watershed at Risk
Mammoth	2	2	3	2	9	
Mona-	1	3	3	3	10	Watershed

Willow/Mendenhall						at Risk
Nephi-East Bench	1	3	3	3	10	Watershed at Risk
Nephi-West Bench/ Dog Valley	2	2	3	2	9	
Rocky Ridge	2	3	3	3	11	
Sevier River Estate	2	2	2	3	9	
Tintic Junction	2	1	1	3	7	
West Desert	3	2	2	2	9	2013 Addition

Source: (Utah Division of Forestry, Fire, and State Lands 2013)

<http://www.ffsl.utah.gov/images/Fire/wui/2013CARsFinalList.pdf>

*These scales ranges from 1 (least) to 3 (most).

**The Overall Score ranges from 0 (No Risk) to 12 (Extreme Risk).

Juab County Landslides

History of Landslides in Juab County

Many landslides in early recorded county history affected mining communities in the northern part of Juab. Most of these communities are now abandoned. Better zoning practices and smarter development have prevented damage from recent landslides. Most damage caused by this hazard affects roadways. A section of SR 132 that runs through Levan experiences annual flooding sometimes accompanied by mudslide and debris flow as most recently happened in summer of 2014.

Date	Location	Notes
July 1939	Eureka	Debris flow, Two feet of mud was deposited on the tracks.
August 1879	Sevier Canyon	Debris flow, The RR took three to four days to repair. Major public infrastructure damage, minor private property damage.
April 1885	Black Canyon	The landslide may have occurred in Juab County but it is possible that the Black Canyon talked about is actually in Colorado.
August 1893	14 miles south of Juab	Debris flow, 300 feet of a RR track was buried with four to five feet of mud and boulders; \$1000 costs. Major public infrastructure damage.
December 1894	Between Silver City and Mammoth Junction	Landslide: The engine of a train destroyed. Minor infrastructure damage.
August 1908	Pinion Canyon near Eureka	Debris flow washed out a road and covered some RR tracks. Major public infrastructure damage.
August 1909	Pinion Canyon near Tintic	Debris flow delayed a train for 12 hours. Minor public infrastructure damage.
June 1927	Ruby Canyon	The debris flow held up railway traffic.
September 1929	Eureka Canyon	Debris flow, Thousands of dollars' worth of costs. Major public infrastructure damage.
July 1931	Eureka Canyon	The debris buried one home. Major private property damage.
July 1943	Salt Creek Canyon near Nephi	The road up Salt Creek Canyon was closed due to mud and debris which had come down from several small gullies.
August 1968	Pigeon Creek Near Levan	The debris flow damaged irrigation ditches and the canyon road; \$23,000 in property damage.

Summer 2014	Levan	Mudslide and debris flow onto SR 132 (personal communication w/ Commissioner Byron Woodland 8/27/14)
Source: Utah Geological Survey (http://geology.utah.gov/databases/landslide-history/landslide-history-intro.htm); Hazard Assessment Meetings with communities		

Landslide Assessment for Juab County

Table 2-11: Hazard Profile for Landslides in Juab County	
Probability of Future Occurrence	Occasional: 1 to 10 percent probability of occurrence in the next year or recurrence interval of 11 to 100 years.
Severity	Negligible
Location	Mass wasting in Juab County is located predominately along Salt Creek Canyon.
Seasonal Pattern	Landslides most often occur within Juab County during spring and late summer months with higher than normal amounts of precipitation.
Duration	Several months
Speed of Onset	No warning
Probability of Future Occurrences:	Likely (Levan, Highway 132)

Location and Extent

In the whole State of Utah, Juab County is ranked as 27th out of 28 counties in terms of landslide vulnerability. High or moderate landslide susceptibility areas make up 803.6 square miles of Juab County. High hazard zones specifically make up only 15.2 square miles, while moderate landslide zones make up 788.4 square miles. Landslides do not pose a significant risk to property.

The extent and cost of damage to **roads and electric infrastructure** are shown in Tables 1-12 and 2-13. The table data represents total length of roads, which overlay historically active landslides.

Table 2-12: Roads		
Name	Miles	Cost
Local street	94.2	\$227,351,700
State Route 132	0.7	\$1,689,450
Interstate I-15	4.8	\$11,584,800

Juab County Earthquakes

History of Earthquakes in Juab County

There is no historical records of damage done by earthquakes in Juab County.

Earthquake Assessment for Juab County

Severity	Catastrophic
Location	A large magnitude earthquake would produce ground shaking felt throughout the entire region. Surface fault rupture is expected in areas of known historic fault movements, for earthquake with a magnitude 6.5 or greater.
Seasonal Pattern	None
Duration	Actual ground shaking will be under one minute yet after shocks may occur for several weeks after.
Speed of Onset	No warning
Probability of Future Occurrences	Unlikely: Less than 1 percent probability of occurrence in the next year or a recurrence interval of greater than every 100 years.

Location and Extent

Much of the populated corridor in Juab County is located near the Wasatch Fault. The Wasatch Fault Zone is the longest and most active normal fault in Utah. The Wasatch Fault extends from south of Malad, Idaho to western Sanpete County. This follows along the populated Wasatch Front, which dips into Juab County. Ten distinct segments have been identified along the fault. Including the Nephi Segment, which reaches into northern Juab County. All of the communities in Juab County are at risk for liquefaction, and potentially nearby landslides if a quake were to occur.

In 2009 the Utah Division of Emergency Management ran a scenario model for the Richfield earthquake segment with magnitude of 6.9. They used HAZUS software for this, which uses a standardized methodology that contains models for estimating potential losses from disaster. It was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. A ShakeMap of this scenario is provided on the next page.

In 2010, FEMA Region VIII performed an analysis on earthquake losses for buildings. The following charts demonstrate data on various issues from a 6.9 earthquake. GIS analysis was also performed for Nephi City, to estimate potential damage.

The Utah Division of Emergency Management found that there would be a total loss of \$151M in Juab County, with 628 displaced households in Nephi. According to 2009-2013 ACS data,

Nephi has about 1,643 total households, so about 40% of households would be displaced in an earthquake event of a 6.9 magnitude.

Table 2-16: HAZUS Loss Estimates			
Direct Economic Losses for Buildings			
Damage	Building Damage	Non-Structural Damage	Total \$\$ loss*
Juab	\$20M	\$66M	\$151M
Nephi City	\$16M	\$41M	\$99M
Source: FEMA Region VII; 2010 most current data. Taken from Utah Assessment by the Division of Emergency Services.			
*Total loss= structural, nonstructural, contents, and inventory damage, as well as income losses resulted from relocation, capital related losses, wage loss, and rental income loss.			
Estimated Displaced Households & Short Term Public Shelter Needs: Nephi, UT			
Public Shelter Needs (Individuals)	559		
Displaced Households	628		
Source: FEMA & URS Corporation, 10/20/09			
Impaired Hospitals at Day 1 of disaster			
Total # of Hospital Beds available	Hospital Beds Available	Injuries Requiring Hospital Treatment 2pm	
31	15	65	
Source: FEMA & URS Corporation 10/20/09			

Levan Town noted in their assessment that a large earthquake could affect their underground infrastructure. This community is has also had several earthquakes with epicenters just south of the city limits. Although most of the quakes were only between one and two, there has been a few between three and five.

Mona City is at a low risk to be the site of an earthquakes epicenter. Although if there were a major earthquake in the area (within 100 miles) the city would experience violent to extreme shocks. **Rocky Ridge** would also feel extreme shocks as it is the northernmost community along I-15 in Juab County.

Nephi City is probably more at risk from geological fault zone damage than any other municipality. It has the largest population and is right along the Wasatch Fault. A quaternary fault hugs the east side of the city by the Wasatch Range, although to date only minor earthquakes have occurred around Nephi. The city rated the impact to their critical facilities to be high. As noted by the scenario model as run by the Utah DEM with HAZUS scenario data, the hospital in Nephi is listed as having less than a 60 percent of being functional at day one of an earthquake. This hospital serves as the major medical center for Juab County.

Juab County Dam Failure

There are nine active dams located in Juab County. Most of these dams are small detention ponds or livestock watering facilities and most pose a minimal threat to human safety or property.

Of the nine active dams, **three are designated as “low hazard”** by the State of Utah Division of Water Rights. As defined by state statute, low hazard dams are those dams which, if they fail, would cause minimal threat to human life, and economic losses would be minor or limited from damage sustained. These dams in Juab County include Burraston Pond, Granite Creek, and Hogback.

A total of **four dams have been designated as “moderate hazard”** by the State of Utah in Juab County. Moderate hazard dams are those that if they fail have a low probability of causing loss of human life, but would cause appreciable property damage including damage to public utilities. The moderate hazard dams in Juab County are the Bigelow Debris and Retention Basin, Juab Lake, Miller Canyon Debris and Retention Basin (Nephi City), and Currant Creek Evaporation Ponds (Pacifcorp).

The State of Utah has rated **two dams in Juab County as “high hazard”** which means that if they fail, have a high probability of causing loss of human life or extensive economic loss, including damage to critical public utilities. They are the Sevier Bridge Dam (15 miles southwest of Levan Town) and Mona Dam (Southwest of Rocky Ridge Town).

Dam failure inundation maps and emergency action plans for each of the high risk dams can be found on the Utah Division of Water Right’s website at: <http://waterrights.utah.gov/cgi-bin/damview.exe?Startup>.

History of Dam Failure in Juab County

No significant dam failures have occurred in Juab County. The Mona Dam was completed in 1895 and the Sevier Bridge Dam was completed in 1915. Both are earth fill dams. Neither have had problems.

Dam Failure Assessment for Juab County

Probability of Future Occurrences	Unlikely: Less than 1 percent probability of occurrence in the next year or a recurrence interval of greater than every 100 years.
Severity	Limited
Location	Would occur downhill from existing dams.
Seasonal Pattern	None
Duration	Depends on dam and type of break; Could be a wall of water which passes through in a few hours, or a slower break which could last for weeks.

Speed of Onset	6 to 12 hours.
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Extent and Location

The Utah Department of Public Safety/Division of Emergency Management ran GIS analysis and included information about Juab County in their 2014 Approved State-wide Hazard Mitigation Plan. It was reported that there was a potential for 17.9 square miles, or 0.5% of the county to be inundated. There are no state facilities in dam failure inundation areas. Juab was ranked 24th in the state (out of 29 counties with dams) for dam failure vulnerability.

Mona Dam

The Mona Dam and reservoir has a high hazard rating. The inundation area covers primarily Goshen and Genola in Utah County. A small amount of inundation will occur around the dam southwest of Rocky Ridge. Although it is a high risk dam for communities in Utah County, it poses little threat to human infrastructure except for Goshen Canyon Road that connects Goshen and Mona Town.

Sevier Bridge Dam

The Sevier Bridge Dam and reservoir is located in the south-east corner of Juab County. It is rated as a high hazard. Most of its inundation area is in Millard County. In Juab County the inundation area would cover a small section of Old Highway 91, and the western agricultural edge of Mills, an unincorporated community in Juab County.

The DEM performed an analysis on dam inundation using HAZUS software. This program uses a standardized methodology that contains models for estimating potential losses from disaster. It was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences.

This analysis estimated that there are a total of nine buildings in the inundated areas. These buildings together costs a total value of \$1,752,892, but it is estimated that of this amount only 0.23% of total building value will be exposed to hazard. This is a per capita exposure of \$171.08 (based off of 2010 Census figures).

Juab County Severe Weather

The types of severe weather considered in this section include wind, winter weather, and severe storm/thunder storm.

History of Severe Weather in Juab County

There are often several severe weather events a year. Some are damage causing and others are not. Even so, they are not listed specifically in this plan. The following is a narrative describing recent records of severe weather in the county

According to SHELDUS county-level data, between 1960 and 2012 there has been a total cost of \$4,541,765 (adj 2013) due to wind damage in Juab County. Since 2000 there has been a total of \$175,521 (adj 2013) alone. According to the National Climatic Data Center, every community has experienced costly damage causing wind storms. Rocky Ridge suffered in economic development when one of their main industries, a cabinet shop, was damaged by micro-blasts in 2011. Since 2013 severe winter weather has cost the county a total of \$538,276 (adj 2013).

Severe Weather Assessment in Juab County

Probability of Future Occurrences	Highly Likely: 90 to 100 percent probability of occurrence in the next year or a recurrence interval of less than 1 year.
Severity	Limited
Location	Anywhere
Seasonal Pattern	Spring and Winter
Duration	A few minutes to several hours
Speed of Onset	Instant

Extent and Location

Areas highly susceptible to lightning strikes include the mountains east and west of the Juab Valley, the Gilson Mountains, Tintic Valley and the area south of Levan. Lightning is problematic because it has the potential to start wildfire, as mentioned in that section.

Major roadways such as I-15 or Highway 132 are especially susceptible to hazard from winter weather. Snow can cause visibility issues to drivers and ice can be the cause of collision.

Every community in Juab County is at risk of severe wind storms or micro-bursts. Damage and flooding from severe rainstorms also pose a risk to the communities. Primarily Levan and Eureka Town's.

APPENDIX I: COUNTY CAPABILITIES

A. Juab County Emergency Management

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
 - a. Coordinate emergency planning and response activities with numerous county agencies. Planning encompasses preparedness, response, recovery, and mitigation.
 - b. Responsible for everyday operations of the county's Emergency Operations Center and 911 communications.
 - c. Update and exercise emergency operations and mitigation plans.
 - d. Coordinate state sponsored training for county agencies including; law enforcement, public health, social services, fire departments, emergency medical services, etc.
 - e. Coordinate the county's Tier Two reporting. (Hazardous materials)
 - f. Public awareness and educational programs via newspapers, radio, and schools to decrease vulnerability to hazards.
 - g. Work with schools and local businesses to help create site-specific hazard response plans and present in-service education to local business employees.
 - h. Responsible for timely and effective public information releases during emergency situations.
 - i. During a disaster declaration, emergency management has all county resources at their disposal including manpower, communications, and equipment.
 - j. Have verbal mutual aid agreements with Millard, Piute, Sanpete, Sevier, and Wayne County Emergency Management Agencies for necessary resources during a disaster situation.
 - k. With effective planning, training, and exercising, emergency management can help to mitigate potential hazards within the county.
 - l. Assist in damage assessment and coordinate with state and federal agencies for recovery assistance.

2. Responsibility and authority in the regulating, inspecting, or funding of projects:
 - a. In coordination with the Six County Association of Governments, assist with applications for federal and state funding such as the Hazard Mitigation Grant Program.
 - b. Involved with inspecting hazardous material storage sites and fulfilling Tier Two reporting requirements.
 - c. Participate in dam inspections with the Army Corp of Engineers.
3. Leadership and coordination with other government agencies:
 - a. Local Agencies: Juab County Emergency Management coordinates with appropriate local agencies to ensure preparedness, response, recovery, and mitigation. These agencies include:

Juab County Commissioners, Juab County Road Department, Juab County Sheriff Department, and various other law enforcement, fire, communication, and emergency medical agencies.
 - b. Non-local Agencies: Juab County Emergency Management coordinates with numerous state and federal agencies. These agencies include the Utah Division of Emergency Services and Homeland Security, Utah Highway Patrol, State Health Department, Department of Transportation, and Federal Emergency Management Agency.
4. General recommendations/Emergency Management concerns:
 - a. Provide listings of eligible mitigation projects so counties can be prepared when funds become available.
 - b. Warning systems and sirens are outdated and inadequate. At this time, funding is not available for improvements.
 - c. Juab County is constantly striving to improve planning and exercise activities and response capabilities. However, with the county growing and becoming more industrial, the threat of potential hazards increases, which increases the need for resources, training, and awareness.
 - d. County needs to add natural hazard mitigation to the General Plan and to the zoning and subdivision ordinances. Based on funding, Six County Planning Staff will work with the county to update the General Plan and

the zoning ordinances to reflect natural hazard mitigation. Existing zoning requirements for flood plain management need to be enforced.

B. Juab County Highway Department

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions)
 - a. Design bridges, culverts, and overflow sections. The County Highway Department follows a very detailed list of design standards for all projects within the county.
 - b. Continually working with the Department of Transportation on various projects since the DOT dispenses federal funding. While the DOT provides technical advice concerning guidelines and standards, they do not provide equipment, materials, or personnel.
2. Responsibility and authority in the regulating, inspecting or funding of projects:
 - a. Responsible for and have authority to regulate and inspect all projects completed within the county.
 - b. All projects funded by the state or federal government are designed by a consulting engineer and meet the usual acceptable federal standards. Inspection of federal aid projects is the responsibility of the consulting engineering company and is overseen by the county to ensure standards are met. Many county projects are designed with in-house expertise and engineers are consulted if problems arise.
 - c. All funding in one-way or another comes through the county, whether it is a certain percentage of the federal aid project or 100% of the county projects.
3. Leadership and coordination with other government agencies:
 - a. Local Agencies: The County Highway Department has little interaction with other county agencies concerning roads and bridges. They do, however, coordinate with various county agencies concerning right of way and right of way purchasing. The legal aspect of right of way purchasing is overseen by the States Attorney's Office. The land values are usually developed by the Tax Equalization Office and approved by the County Commission.
 - b. Non-local Agencies: The County Highway Department coordinates with various State and Federal agencies for technical assistance, permitting,

environmental concerns, archeological sites, and cultural issues. These agencies include the Utah Department of Transportation, US Fish and Wildlife, Corp of Engineers, and the Utah Historical Society.

4. General recommendations/Emergency Management concerns:
 - a. Juab County Highway Department should assist local government with floodplain management and water development permitting.

C. Central Utah Public Health

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions)
 - a. Deal with bona fide health hazards using cause and effect in those areas for both mitigation and risk reduction. If it is a hazard affecting any number of persons and within the scope of public health, Central Utah Public Health (CUPH) will mitigate or exercise risk reduction through several methods ranging from enforcement of statutes to immunization programs.
 - b. Environmental Health has the knowledge and also access to the State Health Department for mitigation of incidents with hazardous or toxic wastes.
 - c. Programs include; waste water treatment, water pollution, public health nursing, immunization programs, solid waste regulation, food establishment inspections, air quality, and vector control.
2. Responsibility and authority in the regulating, inspecting or funding of projects.
 - a. CUPH Health is a unit of state government that operates through agreements or Memorandums of Understanding with the Utah Department of Health to enforce state public health statutes within the Six County district. Tax levies provide funding. There are no funding programs for non-operational programs.
3. Leadership and coordination with other government agencies:
 - a. Local Agencies: Within the scope of public health, CUPH coordinates with the following local agencies; Juab County Emergency Management, local law enforcement agencies (city and county), local school boards, and planning and zoning agencies.

- b. Non-local Agencies: Within the scope of public health, CUPH coordinates with the following agencies; Utah Department of Health and state and federal law enforcement agencies.
4. General recommendations/Emergency Management concerns:
- a. Public Health is normally under funded and understaffed at all levels of government. Should CUPH be called upon for expertise at a time of emergency or disaster, it normally does not have instrumentation for site level determinations of any kind without support from other agencies.
 - b. Public health agencies should be included in equipment storage; e.g., FEMA equipment "stored" and used at public health agencies, rather than being stored at a warehouse.

D. Juab County Sheriff's Department

- 1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
 - a. Responsible for law enforcement and criminal investigation in unincorporated areas of the county and in smaller towns that do not have police departments.
 - b. Provide standard law enforcement manpower and equipment.
 - c. In disaster situations, provide; warning, rescue assistance, evacuation assistance, security, traffic control, and information assistance.
 - d. Provide public awareness and educational programs. (911 education, safe kids program, etc.)
 - e. Have verbal mutual aid agreements with all surrounding counties and the Utah State Highway Patrol.
- 2. Responsibility and authority in the regulating, inspecting, or funding of projects:
 - a. None
- 3. Leadership and coordination with other government agencies:
 - a. Local Agencies: Within the scope of law enforcement, the Juab County Sheriff's Department coordinates with various local agencies. These agencies include Juab County Emergency Management and various local police departments.

- b. Non-local Agencies: Juab County Sheriff's Department coordinates with appropriate state and federal agencies including; Utah Highway Patrol, Utah Attorney Generals Office, Bureau of Criminal Identification, Utah Department of Transportation, and Federal Bureau of Investigation.
4. General recommendations/Emergency Management concerns:
- a. None

E. Juab Fire District

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
- a. Respond to fires in order to protect lives, limit injuries, and minimize damage to property and the environment.
 - b. Respond to accidents in order to provide rescue assistance.
 - c. Assist Emergency Medical Services in providing emergency assistance to sick and injured. (First responders)
 - d. Provide standard firefighting manpower and equipment.
 - e. Respond to spills and releases of hazardous materials and assist in mitigating the detrimental human and environmental effects of these occurrences.
 - f. Respond to emergencies resulting from natural occurrences such as storms, floods, etc., and assist in mitigating the detrimental results of these occurrences.
 - g. Provide training for department members that will enable them to effectively and efficiently carry out their respective duties and responsibilities.
 - h. Develop and provide educational programs that promote the prevention of fires and encourage fire-safe and fire-smart activities.
 - i. Assist in enforcement of city fire ordinances.
 - j. Fire investigation.

- k. Provide assistance to other jurisdictions, as department resources and commitments allow.
 - l. Inspections and preplanning within the fire district to reduce hazards and aid in fire prevention.
 - m. Assist with the county's tier two reporting. (Hazardous materials storage sites)
 - n. In disaster situations, provide assistance in warning, rescue, evacuation, and situation updates.
2. Responsibility and authority in regulating, inspecting, or funding of projects:
- a. None
3. Leadership and coordination with other government agencies:
- a. Local Agencies: In efforts to decrease vulnerability to hazards, the Juab Fire District coordinates with various local agencies. These agencies include Juab County Emergency Management, Nephi City Police Department, Juab County Sheriff's Department, Eureka Fire Department, Levan Fire Department, Mona Fire Department, Rocky Ridge Fire Department, local Public Works, and local Emergency Medical Services.
 - b. Non-local Agencies: Utah State Fire Marshal and the Federal Emergency Management Agency.
4. General recommendations/Emergency Management concerns:

Our district has seen an increase in number and variety of calls. As first responders, we have to train and equip our fire departments for various situations that may arise, such as: vehicle extrication, various types of hazardous materials, and many other types of responses. Each added type of response increases the need for equipment and the time our volunteers need to spend in training. With the recent decrease in population in our district, volunteer retention and recruitment is also a concern.

- a. Seek funding outside of the district for additional equipment that will improve the effectiveness of our responses as well as increase the margin of safety for our volunteers.
- b. Explore training options to cover the expanding variety of responses in our district.
- c. Look into recruitment and retention programs that will work in our district.

F. Utah State University Extension Service

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
 - a. The Utah State University Extension Service provides practical, research-based information and educational programs to address critical issues facing individuals, families, agricultural producers, business operators, and communities.
 - b. County Extension Agents serve as subject-matter experts, educational planners, adult and youth teachers and community facilitators in several areas including agriculture and natural resources, horticulture, family and consumer sciences, 4-H and youth community development.
 - c. Provide planning, designing, implementing, and evaluating of educational programs for livestock and forage clientele.
 - d. Areas of responsibility include beef and dairy cattle, swine, other livestock, water quality, waste management, and forages.
 - e. Provide programming for county citizens in the areas of family financial management, environmental concerns, housing, health and wellness, aging, foods and nutrition, parenting, and human development.
 - f. Serve as an information resource in dealing with drought, winter storms, summer storms etc. in relation to agriculture, environment, water resources, etc.
 - g. Assist with damage assessment related to agriculture.
2. Responsibility and authority in regulating, inspecting, or funding of projects:
 - a. Authority is at federal level.
3. Leadership and coordination with other government agencies:
 - a. Local Agencies: Juab County Emergency Management and Central Utah Public Health.
 - b. Non-local Agencies: Utah State University, Utah State Health Department, United States Department of Agriculture, and Farm Service Agency.
4. General recommendations/Emergency Management concerns:

- a. None.

G. Nephi City Police Department

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions)
 - a. Provide general law enforcement services that are designed to efficiently prevent crime and promote concepts of community policing. These services include traffic control, criminal and accident investigations, neighborhood policing, animal control, and neighborhood and business watches.
 - b. Provide standard law enforcement manpower and equipment.
 - c. Provide public awareness and training programs including: Nurturing Opportunities, Values, and Accountability (NOVA), juvenile diversion programs, Crime Stoppers, gang awareness, a ride along program, and Volunteers in Police Services (VIPS).
 - d. In disaster situations, provide: warning, rescue assistance, evacuation assistance, security, traffic control, and information assistance.
 - e. Involved in the county's local Tier Two reporting (Hazardous Materials).
2. Responsibility and authority in the regulating, inspecting, or funding of projects:
 - a. Provide input to and enforce city ordinances regarding public safety.
3. Leadership and coordination with other government agencies:
 - a. Local Agencies: Within the scope of law enforcement, the Nephi City Police Department coordinates with various local agencies. These agencies include: Juab County Emergency Management, Juab County Sheriff's Department, and the Juab Fire District.
 - b. Non-local Agencies: Nephi City Police Department coordinates with appropriate state and federal agencies including: Utah Highway Patrol, Federal Bureau of Investigation (FBI), Bureau of Alcohol, Tobacco, and Firearms (ATF), and Federal Emergency Management Agency (FEMA).
4. General recommendations/Emergency Management concerns:
 - a. Explore funding alternatives to upgrade outdated and inadequate warning systems (sirens). At this time, federal funding is not available.

- b. Intensify awareness and training in regard to civil disorder and terrorism incidents.

APPENDIX II: COMMUNITY CAPABILITIES

Nephi City Capability Assessment

Nephi City Planning and Regulatory				
Plans	Year	Does the plan address hazards?	Does the plan identify projects to include in the mitigation strategy?	Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	2011	Yes	No	Yes
Capital improvements plan	Annual	No	Yes	Yes
Local Emergency Operations plan	1980's w/ updates	Yes	No	Yes
Transportation plan	2011	No	No	No
Stormwater Management Plan	2009	Yes	Yes	Yes
Building Code, Permitting, and Inspections				
Building Code		Yes		
Building Code Effectiveness Grading Schedule (BCEGS) Score		Score: 6		
Fire department ISO rating	2014	Score: 6		
Site plan review requirements	2010	Yes		
Land Use Planning and Ordinances	Is the ordinance an effective measure for reducing hazard impacts?		Is the ordinance adequately administered and enforced?	
Zoning Ordinance	Yes		Yes	
Subdivision ordinance	Yes		Yes	

Floodplain ordinance	Yes	Yes	
Flood insurance rate maps	2007	Yes	
Nephi City Administrative and Technical			
Administration	Describe Capability	Is coordination effective?	
Planning commission	Good	Yes	
Maintenance programs to reduce risk (e.g. tree trimming, clearing drainage systems)	No written plans	OK	
Mutual aid agreements	In emergency plan	Should be refreshed	
Staff	Yes/No FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?	
Chief building official	PT	Yes/Somewhat	
Floodplain administrator	No	Functions carried out by zoning administrator	
Emergency manager	No	Chief of police	
Community planner	No		
Civil engineer	No	Done by Contract	
Technical	Describe Capability Has capability been used to assess/mitigate risk in the past?		
Warning systems/services (reverse 911, outdoor warning signals)	Just getting started		
Nephi City Financial (funding and tax related capabilities)			
Funding Resource	Access/Eligibility (Yes/No)	Has the funding resource been used in past and for what type of activities?	Could the resource be used to fund future mitigation actions?
Capital Improvements project funding	Yes	Yes-drainage facilities	Yes
Authority to levy taxes for specific purposes	Yes	No	Yes
Fees for water, sewer, gas, or electric services	Yes	Yes- infrastructure protection	Yes
Impact fees for new development	Yes	No	Yes
Storm utility fee	Yes	No	Yes
Incur debt through general obligation bonds and/or special tax bonds	Yes	No	Yes
Incur debt through private activities	No		
Community Development Block Grant	Yes	No	yes

Nephi City Education and Outreach		
Program/Organization	Describe program/organization and how relates to disaster resilience and mitigation.	Could the program/organization help implement future mitigation activities?
Ongoing Public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)	General purpose public information	Yes

Levan Town Capability Assessment

Levan Town Planning and Regulatory				
Plans	Year	Does the plan address hazards?	Does the plan identify projects to include in the mitigation strategy?	Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan		Has a Master Plan		
Capital improvements plan		As part of SCAOG CIB project list		
Building Code, Permitting, and Inspections	Yes/No	Are codes adequately enforced?		
Building Code	Yes	Version/Year: 1BC 2012		
Building Code Effectiveness Grading Schedule (BCEGS) Score	n/a			
Fire department ISO rating	Yes	Rating: 05 and 05X		
Site plan review requirements	Yes			
Land Use Planning and Ordinances	Is the ordinance an effective measure for reducing hazard impacts?		Is the ordinance adequately administered and enforced?	
Zoning Ordinance	Yes		Yes	
Subdivision Ordinance	Yes		Yes	

Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Yes	Yes
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Levan Town Administrative and Technical

Administration	Describe Capability	Is coordination effective?
Planning commission	Good	Yes
Maintenance programs to reduce risk (e.g. tree trimming, clearing drainage systems)	Utility department does this	Yes
Mutual aid agreements	There are mutual aid agreements	
Staff	Yes/No FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief building Official	No	Uses County
Floodplain Administrator	No	
Emergency Manager	No	Uses County
Community Planner	No	
Civil Engineer	No	Uses County
GIS Coordinator	No	Uses County
Technical	Describe Capability Has capability been used to assess/mitigate risk in the past?	
Warning systems/services (reverse 911, outdoor warning signals)	Emergency alert system	
Hazard data and information	Yes	
Grant writing	Yes	

Levan Town Financial (funding and tax related capabilities)

Funding Resource	Access/Eligibility (Yes/No)	Has the funding resource been used in past and for what type of activities?	Could the resource be used to fund future mitigation actions?
Capital Improvements project funding	Yes		
Authority to levy taxes for specific purposes	Yes		
Fees for water, sewer, gas, or electric services	Yes		
Impact fees for new development	yes		
Storm utility fee	n/a		
Incur debt through general obligation bonds	Yes		

and/or special tax bonds			
Incur debt through private activities	No		
Community Development Block Grant	Yes		
Other federal funding programs	Yes		
State funding programs	yes		
Levan Town Education and Outreach			
Program/Organization	Describe program/organization and how relates to disaster resilience and mitigation.	Could the program/organization help implement future mitigation activities?	
Ongoing Public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)	Newsletter, Website		
Local Citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	CERT, LDS church		

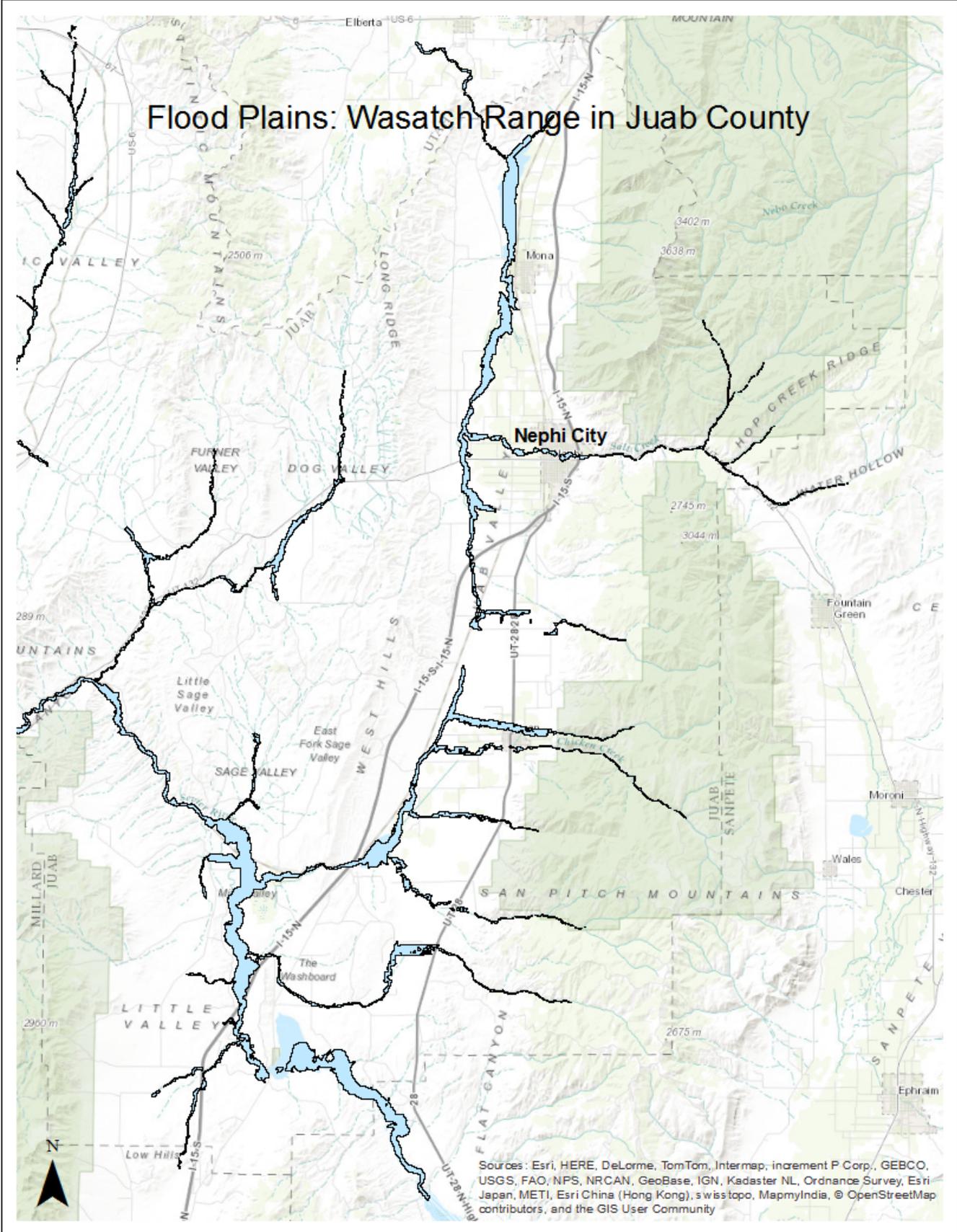
No Information given from:
Rocky Ridge Town, Eureka Town, and Mona Town

APPENDIX III: OTHER AGENCY RESOURCES

A. Mitigation and risk reduction:

1. Juab County Social Services: Temporary assistance to needy families, food stamps, medically needy programs, adult services, homeless assistance, family planning, etc.
2. Army Corps of Engineers: Water and dam management within the county. Provide technical expertise, sandbags, and heavy equipment.
3. Utah Highway Patrol: Situation and damage assessment; provide transportation resources for movement of state personnel, supplies, and equipment to include air and ground reconnaissance; traffic control.
4. State Fire Marshal: Hazmat route utilization; hazmat technical assistance; situation and damage assessment.
5. Forestry, Fire & State Lands: Debris removal from recreational facilities; technical assistance; situation and damage assessment.
6. Utah Division of Wildlife Resources: Technical assistance; debris removal from recreational facilities; facility improvements; situation and damage assessment.
7. State Radio Communications: Exercise readiness of warning systems and communication support.
8. Department of Agriculture: Assists with situation and damage assessment; coordination with USDA; hazmat technical assistance; state land use program.
9. Department of Workforce Services: Situation assessment and administration of disaster unemployment assistance programs.
10. Human Services: Insure liaison with private relief agencies for disaster victims.
11. State Historical Society: Project screening and situation assessment.

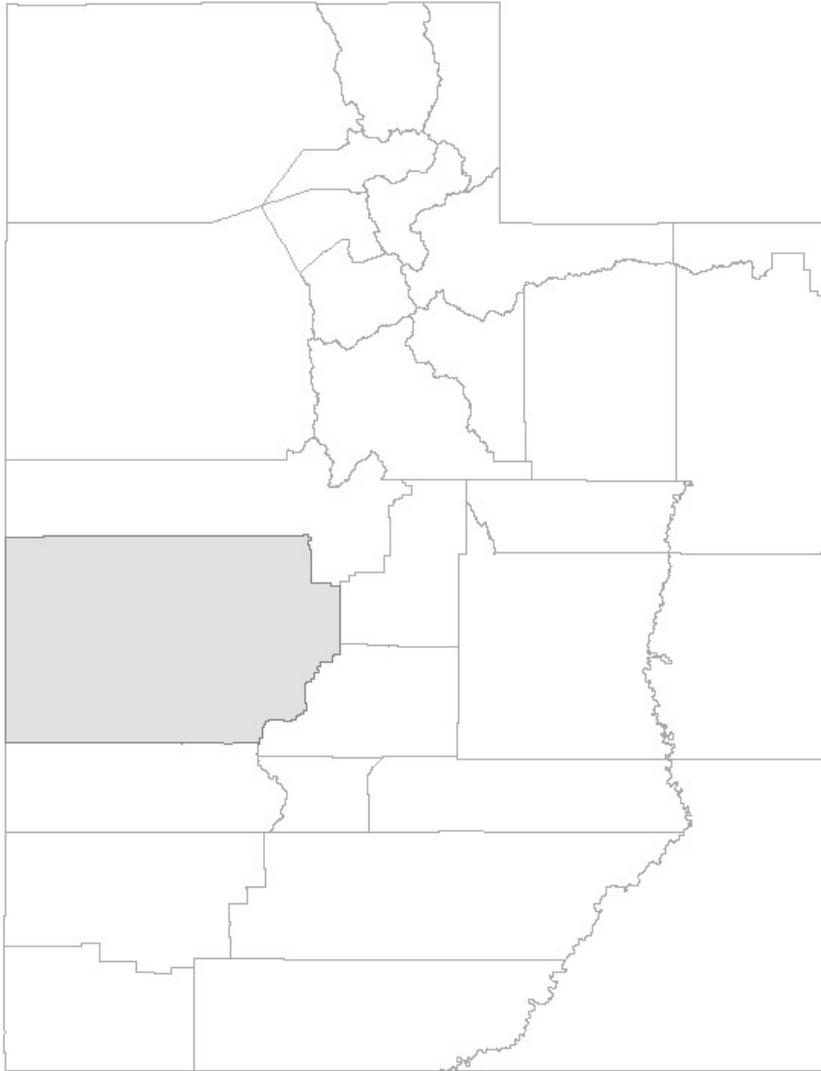
APPENDIX IV: 100- YEAR FLOODPLAIN MAP



Section 3:

Millard County

Natural Hazard Assessment for Pre-Disaster Mitigation



Prepared by: Chelsea Bakaitis, Six County AOG Planning

Contents

- Introduction..... 1
- Background Information..... 1
- Capability Assessment..... 2
 - Millard County Capabilities..... 2
 - Kanosh Town Capabilities..... 2
 - Delta City Capabilities..... 2
- Critical Facilities..... 4
- Millard County Flooding 5
 - History of Flooding in Millard County..... 5
 - Flood Assessment for Millard County..... 6
 - Flood Overview 7
 - NFIP Participation 8
- Millard County Wildfires..... 10
 - History of Wildfires in Millard County 10
 - Wildfire Assessment for Millard County..... 10
 - Location and Extent 10
- Millard County Landslides 12
 - History of Landslides in Millard County 12
 - Landslide Assessment for Millard County 12
 - Location and Extent 12
- Millard County Earthquakes..... 13
 - History of Earthquakes in Millard County..... 13
 - Earthquake Assessment for Wayne County..... 13
 - Location and Extent 13
- Millard County Dam Failure..... 14
 - History of Dam Failure in Millard County 14
 - Dam Failure Assessment for Millard County..... 14
 - Location and Extent 15
 - Corn Creek Dam 15
 - DMAD 15
 - Gunnison Bend..... 15
 - The Sevier Bridge Dam 15
- Millard County Severe Weather 16

History of Severe Weather in Millard County	16
APPENDIX I: COUNTY CAPABILITIES.....	i
A. Millard County Emergency Management.....	i
B. Millard County Highway Department.....	iii
C. Central Utah Public Health	iv
D. Millard County Sheriff's Office.....	v
E. Millard Fire District.....	vi
F. Utah State University Extension Service.....	viii
APPENDIX II: OTHER AGENCY RESOURCES.....	x
Mitigation and risk reduction:.....	x
APPENDIX III: 100-YEAR FLOODPLAIN MAP.....	xi
APPENDIX IV: DAM INUNDATION MAPS	xxiii
APPENDIX V: CLASSIFICATION SYSTEM OF HAZARDS.....	xxviii

Introduction

This document is an assessment of natural hazards in Millard County. It tells about the history of hazards in the county and defines present and future projected risks. It serves as an annex of the general SCAOG Regional Pre-Disaster Mitigation Plan and is divided into sections covering the following hazard topics: flooding, wildfires, landslides, earthquakes, and dam failure. Each section contains information about the history of the hazard, and an assessment of the extent and location of the hazard. Millard County Emergency Manager Lt. Forrest Roper, with the Millard County Sheriff's office was contacted for information and coordination with the communities. All municipalities were contacted for information about hazards in their area.

Background Information

Approximately 618,409 acres or 14% of the total land area in Millard County is privately held and outside the incorporated areas is mostly vacant. The other 86% is owned by the state or federal governments and aside from extractive industry is beyond the reach of development.

Except for lands adjacent to the Sevier and Beaver Rivers and their tributaries, this area is relatively safe from natural hazards. The majority of landslides, debris flows and wildfires occur on these public lands with virtually no impact on development. Of the privately held land, most is not developable due to a lack of water. Other limitations include steepness of the terrain and accessibility.

Millard County zoning ordinances specify water access and a half acre minimum per house. There is still plenty of infill within city limits that can be utilized for safe development without developing in unincorporated, sparsely populated, or hazardous areas. Millard County requires UBC on all new or proposed buildings. New subdivisions require a grading and drainage plan to mitigate any flooding, which may occur.

Most of the development is occurring along the I-15 corridor and US-6 by Delta since this is where most of the private lands are located. It is projected that this trend will continue. The Intermountain Power Plant (IPP) is one of Millard County's major developments in the 1980's and will continue to remain a primary industry. Table 3-1 provides a list of all incorporated municipalities within Millard County. These communities were invited to participate in the planning process.

Figure 3-1: Incorporated Millard County Communities

- Delta
- Fillmore
- Hinckley
- Holden
- Kanosh
- Leamington
- Lynndyl
- Meadow
- Oak City
- Scipio

Capability Assessment

A capability assessment looks at “safeguards” that jurisdictions have in place to prevent or mitigate disasters. These measures include: planning and regulatory policies, administrative and technical roles, tax and funding resources, and educational/outreach programs. For more specifics about capabilities please see Appendices I and III on county capabilities.

Millard County Capabilities

Millard County has several different agencies which support mitigation actions. The Emergency Management of the county helps coordinate mitigation and risk reduction. This group also works with Six County AOG in the making of the mitigation plan. The County Highway Department also works to mitigate risk by making sure roadways are properly maintained with proper equipment to prevent flooding and overflow. Central Utah Public Health acts as a state agency but assists with preventing health hazards in the case of a disaster. The County Sheriff’s Department is responsible for law enforcement in unincorporated areas and smaller towns without departments. It works with the County Fire District in being a response to emergencies. Educational outreach is provided by the Utah State University Extension Service. It provides agricultural and environmental information in dealing with drought and winter storms. It coordinates with County Emergency Management and Public Health. A more detailed list of agencies and their roles can be found in Appendix I.

Kanosh Town Capabilities

The General Plan for the Town of Kanosh addresses natural hazard and possible mitigation measures. They also have a Structure Protection Plan, to safeguard the water system and storage from wildfire. There is a Kanosh CERT group and this also is in coordination with the Millard County CERT. The planning Commission also does work with emergency preparedness and ensuring that building requirements are updated. The town has mutual aid agreements with the Meadow Fire Department as well as the County volunteer group. Most administrative and technical services are delegated to the county. Kanosh has an Emergency Notification siren system. Grant writing is done by the Kanosh Town Clerk and by contracted firms. On a financial standpoint, the community has the authority to levy taxes, charge extra fees for water and electric services, create impact fees for new development, and incur debt through general obligation bonds. The community also has the opportunity to make use of CIB and CDBG funds.

Delta City Capabilities

The City of Delta has the Local Emergency Operations Plan in place that addresses general and/or potential hazards, local response responsibilities. There are no other plans in place addressing hazards. Building codes, fire department ISO ratings, and site plan review requirements are also enforced along with zoning and subdivision ordinances. The community does not have any floodplain or natural hazard specific ordinances. The community Planning Commission takes care of general hazard planning, and the maintenance program works to reduce risk. There is a mutual aid agreement with UTWARN. The city does not have any staff that deal with mitigation issues specifically (e.g. building official, floodplain administrator, emergency manager, civil engineer, GIS etc.) but rely on the county staff. Delta has a warning siren system. The community does not have the authority to levy taxes, charge impact fees, or storm utility fees. But there are fees for water and sewer services. Funding sources may be

general obligation bonds, special tax bonds, CDBG or CIB. The community has a few education and outreach programs through the Fire Department. This includes CERT, and Fire Prevention Week.

No capability information was received from the listed municipalities:

- Fillmore
- Hinckley
- Holden
- Leamington
- Lynndyl
- Meadow
- Oak City
- Scipio

Critical Facilities

Critical facilities are given special consideration when planning mitigation projects: They are the activities and facilities that even a slight chance of a hazard is a great threat. Critical facilities include hospitals, fire stations, police stations, critical records, water treatment, and other similar facilities.

Table 3-2: Millard County Critical Facilities		
Critical Facilities	Greatest Risk	History of Damage
Kanosh Town Critical Facilities		
Culinary Water Electrical Infrastructure	Flooding Earthquake Wind burst	- 1984 flooding affected culinary water system in canyon - Electrical Infrastructure: Wind burst took out poles. Town was one day without power (connecting poles to Meadow Town)
Delta City Critical Facilities		
City offices City shop Fire Department Hospitals/care center 6 different sewer stations 3 different water wells Airport	Earthquake Severe weather	none

No critical facility information was received from:

- Fillmore
- Hinckley
- Holden
- Leamington
- Lynndyl
- Meadow
- Oak City
- Scipio

Millard County Flooding

History of Flooding in Millard County

According to the Utah Division of Emergency Management State Hazard Assessment (2014), Millard has also had the most National Flood Insurance Program (NFIP) claims out of the whole state, besides the populous counties of Davis, Salt Lake and Utah. There have been a total of 76 claims in Millard. This is very high considering that the state average is about 16 claims per county. Even so, the county has the least number of people at 65 per NFIP claim.

According to the Spatial Hazard Events and Losses Database (SHELDUS) 2013 data between 1980 and 2012 there has been a total flood loss of \$11,330,275 and one injury. \$5,840,551 of the total was in property damage and \$5,489,724 in crop loss.

The county also was issued a Disaster Declaration in 1984. This year the region saw the worst flooding in recorded history. Corn Creek Dam was damaged during these flood events.

In 2011 a Presidential Disaster Declaration was issued for 18 counties in Utah, including Millard County. Table 3-2 provides a listed history of major flood events from 1896 to 2014.

Date	Location	Critical Facility or Area Impacted	Comments
August 4-6, 1945	Oak City	Homes and fields in Oak City.	Dry Creek and Oak Creek drainages.
July 18, 1951	Scipio	Damage to farms, crops, and residential areas.	\$25,000.00 in damages.
August 25, 1958	Scipio	Damage to farmlands and Highway 63.	\$3,000.00 in damages.
July 31, 1961	Fillmore	City homes and water lines	Chalk Creek
September 1972		\$2,143 property damage (ADJ 203)	
May 1983	Fillmore, Deseret, and Scipio	Loss of over 140 homes, rail lines, sewer lines, roads, etc. \$5,568,870 Crop damage (ADJ 2013) \$5,568,870 Property damage (ADJ 2013)	Chalk Creek, Oak Creek, and the Sevier River; \$1,000,000 in public assistance.
May 1984	County wide	All sectors \$121,448 Property Damage (ADJ 2013)	Public assistance total \$492,204. Major Disaster Declaration
February 1986		\$62,515 Property Damage (ADJ 2013)	

September 1998		\$1,264 Crop Damage \$7,695 Property damage (ADJ 2013)	
August 2000	Holden	Damage to 4 structures and municipal roadways.	Unknown
May 2005		\$2,982 Property Damage (ADJ 2013)	
2006	Oak City		Flooding after Devil Dan Fire
August 2011	County wide	\$51,782 Property Damage (ADJ 2013)	\$4.06 per capita impact. Record Breaking snowpack, heavy spring rains and warm summer temperatures led to flooding. Presidential Disaster Declaration.
September 2012		\$101,464 Property Damage (ADJ 2013)	
2013	Oak City		Two major floods in Town. Called for Flood and Basin Channel control measures.
August 2013	Fillmore	\$20,000 Property Damage (ADJ 2013)	
August 15, 2014	Gandy	Flash flood ruins home	Initially caused by lightening caused fire

Source: History of Millard County, Utah State Historical Society, and Millard County Assessment Meeting December 2014.

Flood Assessment for Millard County

Flooding in Millard County occurs primarily along flood plains. The County’s main flooding threat is from snowmelt runoff during spring months. Flooding caused by summer thunderstorms last a couple of hours, whereas flooding due to spring runoff can last weeks. The following table provides a summary of flooding in Millard County. More detail per community is discussed further in this section.

Table 3-3:1 Summary of Millard County Flooding*

Jurisdiction	location	extent	history	probability	potential impacts especially to critical facilities	Overall significance	NFIP participation
Delta	Negligible	Weak	none recorded	unlikely	none considered	low	NSFHA
Fillmore	Limited	Moderate	1961, 1983, and 2013	Occasional	water and sewer, crop and property damage, drainage, residential	medium	NSFHA
Hinckley	Negligible	Weak	none recorded	unlikely	none considered	Low	NSFHA
Holden	Limited:	Moderate	2000	Occasional	Businesses along Main Street, and municipal roadways	medium	Effective map

		e		l			
Kanosh	Negligible	weak	none recorded	unlikely	none considered	low	NSFHA
Leamington	Negligible	weak	none recorded	unlikely	highway 132, residences and agriculture	low	Zone D
Oak City	limited	moderate	major flooding in 1945, 2006 and 2013	occasional	wreckage to channel and flood basin, agriculture	medium	NSFHA
Scipio	negligible	Weak	1951 and 1958	unlikely	damage or cut off of travel center, and business into town	low	NSFHA
Meadow	negligible	weak	none recorded	unlikely	none considered	low	None
Lynndyl	negligible	weak	none recorded	unlikely	Highway 6, agriculture	low	None
Unincorporated	Limited	moderate	1972, 1984, 1986, 2005, 2012	Occasional	Roads and infrastructure	medium	Zone D
See Classification System in Appendix V							

Flood Overview

100-year Floodplain maps were created by the Utah Division of Emergency Services. They used HAZUS, a loss estimation program, to create a 100-year floodplain computer simulated scenario. This means that it looked at the flooding impact with a 1% chance of flooding in any given year. These floodplain zones could pose a potential risk to residents and their property, and included in this analysis. For maps of these floodplains created by the state please see APPENDIX III.

According to this analysis, in the event of a 100-year flood Millard would experience a \$1.27 per capita loss. This loss is the fifth highest out of 28 counties (based on 2012 estimates). Millard was ranked as having a medium level of vulnerability in relation to flood loss estimates. For more information about this data please refer to the 2014 Utah DEM State-Wide Flood Assessment.

According the HAZUS 100 year floodplain map, **Delta** is at risk of flooding from the west close to the Gunnison Bend Reservoir. There may also be some flooding in the south east edge of town.

The floodplain travelling through **Fillmore** follows Canyon Road, along the eastern residential edge of the city. It also cuts through close to where Main Street and 400 North intersect. I-15 through this part of Fillmore is within the 100-year floodplain Chalk Creek has a drainage area of about 67 square miles. The creek channel is highly incised through much of the community. Vulnerable structures are primarily located where Chalk Creek crosses Highway 9 and downstream to I-15 (USACE 2003).

The community of **Holden** has a floodplain cutting through a large portion of the northern part of town. The path of the floodplain cuts through Main Street from about 100 North to 400 north.

Hinckley has no floodplains within city limits. Inhabited and agricultural **unincorporated** areas surrounding Delta and Hinckley have large stretches of land in floodplain zones.

Kanosh is not projected to be impacted by a 100-year flood. Unincorporated land east of the community is at risk.

The top border of **Leamington** is within a floodplain zone.

The western edge of the main residential area of **Lynndyl** is within a floodplain, even so, most of the community is on a plateau, and away from the Sevier River floodplain. The path of the floodplain is primarily through agricultural areas and not major residential areas. It is designated as a NSFHA.

Meadow has no floodplain within town limits. Although there is a floodplain that crosses I-15 directly north of the town.

Oak City is at risk of a 100-year floodplain along the southern border of the community.

There is a small stretch of land incorporated into **Scipio** that includes a travel center. This area is within a floodplain. The rest of the town is not in a designated floodplain.

According to the 2003 US Army Corps of Engineers Flood Hazard Identification Study, flood threat in unincorporated Millard County is the greatest around the Sevier and Beaver Rivers and their tributaries. For a look at all **unincorporated** land with floodplain hazards please see the general Millard County 100-Year HAZUS Floodplain Map in APPENDIX III.

NFIP Participation

All municipalities except Meadow and Lynndyl are participants in the National Flood Insurance Program (NFIP). Most communities are designated as Not Special Flood Hazard Areas. Their Current Effective Map Date and Date of Entry is listed in Table 3-5.

Community Name	Current Effective Map Date	Date of Entry
DELTA, CITY	Not Special Flood Hazard Area	12/9/1985
FILLMORE, CITY	Not Special Flood Hazard Area	11/5/1985
HINCKLEY, TOWN	Not Special Flood Hazard Area	11/30/1983
HOLDEN, TOWN	03/01/1986(L)	03/01/1986
KANOSH, CITY	Not Special Flood Hazard Area	12/11/1985
LEAMINGTON, TOWN	09/4/1987 (All Zone D, or Areas of undetermined, but possible flood hazards)	09/04/1987
MILLARD COUNTY	09/4/1987 (All Zone D, or Areas of undetermined, but possible flood hazards)	09/04/1987
OAK CITY, TOWN	Not Special Flood Hazard Area	02/02/1984

SCIPIO, TOWN	Not Special Flood Hazard Area	02/02/1984
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There has been no Flood Insurance Studies (FIS) done for any of the communities, even those participating in the NFIP. There is a Flood Insurance Rate Map (FIRM) that provides flood-zone information for the Town of Holden, but this has not been updated since 1986.

NFIP Participation

The jurisdictions participate in NFIP by enforcing minimum floodplain ordinances.

Addressing Repetitive Loss Properties

There are no repetitive loss properties in Millard County (FEMA, 2014).

Millard County Wildfires

History of Wildfires in Millard County

According to the Central Utah Wildfire Protection Plan, there has been a total of 1,162 fire starts between 1973 and 2005; most of these have occurred in the Pahvant Mountains and in the Oak City/Canyon Mountain area.

In 2007 the state of Utah experienced three large fires, Milford Flat, Neola, and Salt Creek. When the wildfire season was over, Millard County experienced significant dust storms, creating hazardous driving conditions along I-15. These dust storms were caused by unsettled dust from the wildfires of the season.

The Milford Flat fire was the largest in Utah history and burned through Millard and Beaver Counties. About 363,052 acres were burned between the two counties, but because of lack of development, there was minor damage.

In recent years Millard County has seen two large fires, the 2012 Clay Springs and 2013 Rockport fires. Each were FEMA declared disasters.

Wildfire Assessment for Millard County

Probability of Future Occurrence	Likely: 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years.
Severity	High in the Wildland Urban Interface
Location	Pahvant West Bench (Holden, Kanosh, Meadow, Cove Fort), Oak City, Leamington/Lynndyl and Scipio.
Seasonal Pattern	Most wildfires affecting Millard County occur during mid to late summer months (fire season).
Duration	The amount of time needed to contain a wildfire depends on a variety of uncontrollable variables such as: wind speed, relative humidity, type, and moisture content of fuel, weather, and topography. Thus containment time varies for each fire.
Speed of Onset	0 to 6 hours is the minimum amount of time given to homeowners in order to evacuate.

Location and Extent

According to the 2014 State Hazard Assessment Plan Millard County has 5,256.6 square miles in extreme or high hazard zones. Millard County is ranked third in the state of Utah in terms of wildfire vulnerability.

According to the Central Utah Regional Wildfire Protection Plan (2007). Watersheds are areas of concern because of the potential for flooding, debris flow and degradation of municipal watershed water quality following wildland fire. Flooding is a concern along the Sevier River and its tributaries, Oak and Dry creeks, Corn Creek, Pine Creek, Chalk Creek, and Meadow Creek. Spring runoff or precipitation from summer thunderstorms can cause post wildfire/damaged watershed flooding.

Special hazard and risk areas include land surrounding **I-15, Utah-26 from Holden to Delta** and the cultivated dry land areas of **Dog Valley, Kanosh and Fillmore**. The Utah Division of Forestry, Fire & State Lands ranked the following areas as having a high wildfire risk (listed in order of risk): **Pahvant West Bench (Holden, Kanosh, Meadow, and Cove Fort), Oak City, Leamington/Lynndyl and Scipio**.

A WUI ordinance was passed to address these issues. The ordinance requires new subdivisions or homes built in Millard County's WUI to adhere to more stringent water supply, building material, and defensible space.

Millard County Landslides

History of Landslides in Millard County

There is no history of major landslides causing harm to life or property.

Landslide Assessment for Millard County

Table 3-7: Hazard Profile for Landslides in Millard County

Probability of Occurrence	Occasional: 1 to 90 percent probability of occurrence in the next year or a recurrence interval of 11 to 100 years
Severity	Negligible
Location	Mass wasting in Millard County is located predominately along the canyons in the unincorporated areas east of the Pahvant Valley.
Seasonal Pattern	Landslides most often occur within Millard County during spring months with higher than normal amounts of precipitation.
Duration	Several months
Speed of Onset	No warning

Location and Extent

According to the State Hazard Assessment, Millard County has 1,187.8 square miles of areas within high or moderate landslide susceptibility areas. Out of the 28 counties of Utah assessed, Millard County ranks 25th in terms of landslide vulnerability (based on seven criteria from the landslide risk assessment).

According to the Utah Geological Survey, there are no communities nor major roadways that are in historically active landslide zones. Although, a few historically active landslides do occur in the Pahvant Valley unincorporated areas.

Millard County Earthquakes

History of Earthquakes in Millard County

There is no history of damage causing earthquakes in Millard County.

Earthquake Assessment for Wayne County

Probability of Occurrence	Unlikely: Less than 1 percent probability of occurrence in the next year or a recurrence interval of greater than every 100 years.
Severity	Catastrophic
Location	Ground shaking will be felt throughout the entire county if a large earthquake were to occur. Surface fault rupture could be expected in areas of known historic fault movements. Liquefaction is expected in areas of high to moderate liquefaction potential, which covers a vast portion of Millard County.
Seasonal Pattern	None
Duration	Actual ground shaking will be under one minute yet aftershocks may occur for weeks after.
Speed of Onset	No warning

Location and Extent

In 2009 the Utah Division of Emergency Management ran a scenario model for the Nephi and Richfield Earthquake Segments located in the Six County Region. The model looked at impact of a 6.9 magnitude earthquake. The HAZUS software used in creating this model, uses a standardized methodology that contains models for estimating potential losses from disaster. It was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences.

Millard County had no projected casualties in the case of earthquakes in these areas. There is a potential building loss of \$48,000 and Non-Structural damage of \$132,000. This is a total loss of \$298,000. There is a projected per capita loss of \$23.83. Out of the 29 counties of Utah, Millard ranks 18th in terms of earthquake vulnerability based off these models.

The community of **Leamington's** Town Hall is an early pioneer church building. A major earthquake would cause destruction to the building that is both of practical and historical use.

Millard County Dam Failure

There are 15 active dams located in Millard County, as designated by the Utah Division of Water Rights. Most of these dams are detention ponds or livestock watering facilities. Most pose a minimal threat to human safety or property, although may cause flooding in the case of failure.

Of the active dams, eight are considered “low” hazard dams by the UDWR. As defined by state statute, low hazard dams are those dams which, if they fail, would cause minimal threat to human life, and economic losses would be minor or limited from damage sustained. This low hazard dams are as listed: Brush Wellman Tailings Dam, Fool Creek No 2, and the Intermountain Power Dams of Bottom Ash Recycle, Basins, Evaporation Ponds, Settling Basin, Storage Basin and Waste Water.

Four dams have been designated as “moderate hazard”. These are dams that if they fail, have a low probability of causing loss of human life, but would cause appreciable property damage including damage to public utilities. These are the: Fool Creek No 1, Magnum NGLS Pond 1, Press Lake, and Scipio Lake dams.

Three dams have been designated as “high hazard” within Millard County. This designation is for dams that if they fail, have a high probability of causing loss of human life or extensive economic loss, including damage to critical public utilities. These are the Corn Creek, DMAD, and Gunnison Bend dams. The Sevier Bridge Dam is another high hazard dam that is located in southern Juab but inundates Millard County.

Dam failure inundation maps and emergency action plans for each of the high risk dams can be found on the UDWR’s website at: <http://waterrights.utah.gov/cgi-bin/damview.exe?Startup>.

History of Dam Failure in Millard County

In the spring of 1983 the Corn Creek Dam washed out and flooded lands by Kanosh. The DMAD dam also failed near Delta. This caused 16,000 acres of water inundation in the unincorporated community of Deseret. One person was killed attempting to cross the flood on a pipe (History of Millard County, Utah State Historical Society).

Dam Failure Assessment for Millard County

Probability of Occurrence	Occasional: 1 to 10 percent probability of occurrence in the next year or a recurrence interval of 11 to 100 years.
Severity	Limited
Location	Would occur downhill from existing dams.
Seasonal Pattern	Spring, most likely due to significant flooding.
Duration	Depends on dam and type of break; Could be a wall of water which passes through in a few hours, or a slower break which could last for weeks.
Speed of Onset	6 to 12 hours.

Location and Extent

According to the Utah DEM State Wide Assessment, Millard County has the most total potential inundation areas out of all the counties in the State of Utah. 560.1 square miles of the county is in inundation areas, this is 8.2% of the county. The county has 4,190 people per high hazard dam, based off a 2012 census estimate by the UDWR.

The Utah DEM also created a HAZUS model to estimate the building stock exposure to dam inundation and then created estimated values off of the model. It was estimated that 187 buildings are in inundation areas. The estimated cost of potential exposure is \$33,122,397. This is a per capita exposure of \$2,649. For more details on the analysis please consult the 2014 State Hazard Assessment.

The following are descriptions of the high risk dams. For inundation maps please consult Appendix IV. The Utah Division of Water Rights online is also a resource for more information about these dams.

Corn Creek Dam

The Corn Creek Dam is located south east of Kanosh. Its inundation pattern is significant to human development covers the residential area of Kanosh and floods surrounding agriculture. In 1983 it was damaged by flood waters.

DMAD

The DMAD Dam is located north east of Delta and Hinckley. The inundation pattern for this dam travels through agriculture around Delta, and covers the residential area of Hinckley and the unincorporated communities of Deseret and Sutherland. Agricultural land west of Delta and surrounding Hinckley and Deseret are within the DMAD inundation path. In 1983 it was damaged by flood waters.

Gunnison Bend

The Gunnison Bend Dam is located between Delta and Hinckley. The inundation pattern for this dam covers the south east part of Hinckley and the whole of the small unincorporated communities of Deseret and Oasis. Most agriculture in this area is in the inundation path.

The Sevier Bridge Dam

The Sevier Bridge Dam is located in the southern part of the horn of Juab County. The Inundation Path covers much of the residential area of Leamington and Lynndyl along with farmland around and between the two communities. The inundation path travels south along Highway 6 and covers agricultural land north-west of Delta. The community of Hinckley and the unincorporated community of Deseret and the surrounding agricultural lands are also within the Sevier Bridge Dam inundation path.

Millard County Severe Weather
History of Severe Weather in Millard County

APPENDIX I: COUNTY CAPABILITIES

A. Millard County Emergency Management

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
 - a. Coordinate emergency planning and response activities with numerous county agencies. Planning encompasses preparedness, response, recovery, and mitigation.
 - b. Responsible for everyday operations of the county's Emergency Operations Center.
 - c. Update and exercise emergency operations and mitigation plans.
 - d. Coordinate state sponsored training for county agencies including; law enforcement, public health, social services, fire departments, emergency medical services, etc.
 - e. Coordinate the county's Local Emergency Planning Committee (meets every odd-numbered month).
 - f. Coordinate the county's Tier Two reporting. (Hazardous materials)
 - g. Public awareness and educational programs via newspapers, radio, and schools to decrease vulnerability to hazards.
 - h. Work with schools and local businesses to help create site-specific hazard response plans and present in-service education to local business employees.
 - i. Responsible for timely and effective public information releases during emergency situations.
 - j. During a disaster declaration, emergency management has all county resources at their disposal including manpower, communications, and equipment.
 - k. Have verbal mutual aid agreements with Juab, Piute, Sanpete, Sevier, and Wayne County Emergency Management Agencies for necessary resources during a disaster situation.
1. With effective planning, training, and exercising, emergency management can help to mitigate potential hazards within the county.

- m. Assist in damage assessment and coordinate with state and federal agencies for recovery assistance.
2. Responsibility and authority in the regulating, inspecting, or funding of projects:
 - a. In coordination with the Six County Association of Governments, assist with applications for federal and state funding such as the Hazard Mitigation Grant Program.
 - b. Involved with inspecting hazardous material storage sites and fulfilling Tier Two reporting requirements.
 - c. Participate in dam inspections with the Army Corp of Engineers.
 3. Leadership and coordination with other government agencies:
 - a. Local Agencies: Millard County Emergency Management coordinates with appropriate local agencies to ensure preparedness, response, recovery, and mitigation. These agencies include:

Millard County Commissioners, Millard County Road Department, Millard County Sheriff's Office, and various other fire, communication, and emergency medical agencies.
 - b. Non-local Agencies: Millard County Emergency Management coordinates with numerous state and federal agencies. These agencies include the Utah Division of Emergency Services and Homeland Security, Utah Highway Patrol, State Health Department, Department of Transportation, and Federal Emergency Management Agency.
 4. General recommendations/Emergency Management concerns:
 - a. Provide listings of eligible mitigation projects so counties can be prepared when funds become available.
 - b. Millard County is constantly striving to improve planning and exercise activities and response capabilities. However, with the county growing and becoming more industrial, the threat of potential hazards increases, which increases the need for resources, training, and awareness.
 - c. County needs to add natural hazard mitigation to the General Plan and to the zoning and subdivision ordinances. Based on funding, Six County Planning Staff will work with the county to update the General Plan and the zoning ordinances to reflect natural hazard mitigation. Existing zoning requirements for flood plain management need to be enforced.

- d. Assist Emergency Medical Services in providing emergency assistance to sick and injured. (first responders)

B. Millard County Highway Department

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions)
 - a. Design bridges, culverts, and overflow sections. The County Highway Department follows a very detailed list of design standards for all projects within the county.
 - b. Continually working with the Department of Transportation on various projects since the DOT dispenses federal funding. While the DOT provides technical advice concerning guidelines and standards, they do not provide equipment, materials, or personnel.
2. Responsibility and authority in the regulating, inspecting or funding of projects:
 - a. Responsible for and have authority to regulate and inspect all projects completed within the county.
 - b. All projects funded by the state or federal government are designed by a consulting engineer and meet the usual acceptable federal standards. Inspection of federal aid projects is the responsibility of the consulting engineering company and is overseen by the county to ensure standards are met. Many county projects are designed with in-house expertise and engineers are consulted if problems arise.
 - c. All funding in one-way or another comes through the county, whether it is a certain percentage of the federal aid project or 100% of the county projects.
3. Leadership and coordination with other government agencies:
 - a. Local Agencies: The County Highway Department has little interaction with other county agencies concerning roads and bridges. They do, however, coordinate with various county agencies concerning right of way and right of way purchasing. The legal aspect of right of way purchasing is overseen by the States Attorney's Office. The land values are usually developed by the Tax Equalization Office and approved by the County Commission.
 - b. Non-local Agencies: The County Highway Department coordinates with various State and Federal agencies for technical assistance, permitting,

environmental concerns, archeological sites, and cultural issues. These agencies include the Utah Department of Transportation, US Fish and Wildlife, Corp of Engineers, and the Utah Historical Society.

4. General recommendations/Emergency Management concerns:
 - a. Millard County Highway Department should assist local government with floodplain management and water development permitting.

C. Central Utah Public Health

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions)
 - a. Deal with bona fide health hazards using cause and effect in those areas for both mitigation and risk reduction. If it is a hazard affecting any number of persons and within the scope of public health, Central Utah Public Health (CUPH) will mitigate or exercise risk reduction through several methods ranging from enforcement of statutes to immunization programs.
 - b. Environmental Health has the knowledge and also access to the State Health Department for mitigation of incidents with hazardous or toxic wastes.
 - c. Programs include; waste water treatment, water pollution, public health nursing, immunization programs, solid waste regulation, food establishment inspections, air quality, and vector control.
2. Responsibility and authority in the regulating, inspecting or funding of projects.
 - a. CUPH Health is a unit of state government that operates through agreements or Memorandums of Understanding with the Utah Department of Health to enforce state public health statutes within the Six County district. Tax levies provide funding. There are no funding programs for non-operational programs.
3. Leadership and coordination with other government agencies:
 - a. Local Agencies: Within the scope of public health, CUPH coordinates with the following local agencies; Millard County Emergency Management, local law enforcement agencies (city and county), local school boards, and planning and zoning agencies.

- b. Non-local Agencies: Within the scope of public health, CUPH coordinates with the following agencies; Utah Department of Health and state and federal law enforcement agencies.

4. General recommendations/Emergency Management concerns:

- a. Public Health is normally underfunded and understaffed at all levels of government. Should CUPH be called upon for expertise at a time of emergency or disaster, it normally does not have instrumentation for site level determinations of any kind without support from other agencies.
- b. Public health agencies should be included in equipment storage; e.g., FEMA equipment "stored" and used at public health agencies, rather than being stored at a warehouse. For example, radio equipment that belongs to FEMA is based at county emergency management offices; the same could be done with air sampling equipment or other instruments/kits etc., which could be used by public health agencies both for daily work and at a time of emergency or disaster.

D. Millard County Sheriff's Office

- 1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
 - a. Responsible for law enforcement and criminal investigation in the county.
 - b. Provide standard law enforcement manpower and equipment.
 - c. In disaster situations, provide; warning, rescue assistance, evacuation assistance, security, traffic control, and information assistance.
 - d. Provide public awareness and educational programs. (911 education, safe kids program, etc.)
 - e. Have mutual aid agreements with all surrounding counties and Utah State Highway Patrol.
- 2. Responsibility and authority in the regulating, inspecting, or funding of projects:
 - a. None
- 3. Leadership and coordination with other government agencies:

- a. Local Agencies: Within the scope of law enforcement, the Millard County Sheriff's Office coordinates with various local agencies. These agencies include Millard County Emergency Management.
 - b. Non-local Agencies: Millard County Sheriff's Office coordinates with appropriate state and federal agencies including; Utah Highway Patrol, Utah Attorney General's Office, Bureau of Criminal Identification, Utah Department of Transportation, and Federal Bureau of Investigation.
4. General recommendations/Emergency Management concerns:
- a. None

E. Millard Fire District

- 1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
 - a. Fund local city fire departments enabling them to respond to fires in order to protect lives, limit injuries, and minimize damage to property and the environment.
 - b. Enable local fire departments to respond to accidents in order to provide rescue assistance.
 - c. Provide standard firefighting manpower and equipment.
 - d. Respond to spills and releases of hazardous materials and assist in mitigating the detrimental human and environmental effects of these occurrences.
 - e. Respond to emergencies resulting from natural occurrences such as storms, floods, etc., and assist in mitigating the detrimental results of these occurrences.
 - f. Provide training for department members that will enable them to effectively and efficiently carry out their respective duties and responsibilities.
 - g. Develop and provide educational programs that promote the prevention of fires and encourage fire-safe and fire-smart activities.
 - h. Assist in enforcement of city fire ordinances.
 - i. Fire investigation.

- j. Provide assistance to other jurisdictions, as department resources and commitments allow. Millard Fire District has mutual aid agreements with Juab, Piute, Sanpete, Sevier and Wayne Counties.
 - k. Inspections and preplanning within the fire district to reduce hazards and aid in fire prevention.
 - l. In disaster situations, provide assistance in warning, rescue, evacuation, and situation updates.
2. Responsibility and authority in regulating, inspecting, or funding of projects:
- a. None
3. Leadership and coordination with other government agencies:
- a. Local Agencies: In efforts to decrease vulnerability to hazards, the Millard Fire District coordinates with various local agencies. These agencies include Millard County Emergency Management, Millard County Sheriff's Office, Fillmore Fire Department, Delta Fire Department, other local fire departments, local Public Works, and local Emergency Medical Services.
 - b. Non-local Agencies: Utah State Fire Marshal and the Federal Emergency Management Agency.
4. General recommendations/Emergency Management concerns:

Our district has seen an increase in number and variety of calls. As first responders, we have to train and equip our fire departments for various situations that may arise, such as: vehicle extrication, various types of hazardous materials, and many other types of responses. Each added type of response increases the need for equipment and the time our volunteers need to spend in training. With the recent decrease in population in our district, volunteer retention and recruitment is also a concern.

- a. Seek funding outside of the district for additional equipment that will improve the effectiveness of our responses as well as increase the margin of safety for our volunteers.
- b. Explore training options to cover the expanding variety of responses in our district.
- c. Look into recruitment and retention programs that will work in our district.

F. Utah State University Extension Service

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
 - a. The Utah State University Extension Service provides practical, research-based information and educational programs to address critical issues facing individuals, families, agricultural producers, business operators, and communities.
 - b. County Extension Agents serve as subject-matter experts, educational planners, adult and youth teachers and community facilitators in several areas including agriculture and natural resources, horticulture, family and consumer sciences, 4-H and youth community development.
 - c. Provide planning, designing, implementing, and evaluating of educational programs for livestock and forage clientele.
 - d. Areas of responsibility include beef and dairy cattle, swine, other livestock, water quality, waste management, and forages.
 - e. Provide programming for county citizens in the areas of family financial management, environmental concerns, housing, health and wellness, aging, foods and nutrition, parenting, and human development.
 - f. Serve as an information resource in dealing with drought, winter storms, summer storms etc. in relation to agriculture, environment, water resources, etc.
 - g. Assist with damage assessment related to agriculture.
2. Responsibility and authority in regulating, inspecting, or funding of projects:
 - a. Authority is at federal level.
3. Leadership and coordination with other government agencies:
 - a. Local Agencies: Millard County Emergency Management and Central Utah Public Health.
 - b. Non-local Agencies: Utah State University, Utah State Health Department, United States Department of Agriculture, and Farm Service Agency.
4. General recommendations/Emergency Management concerns:

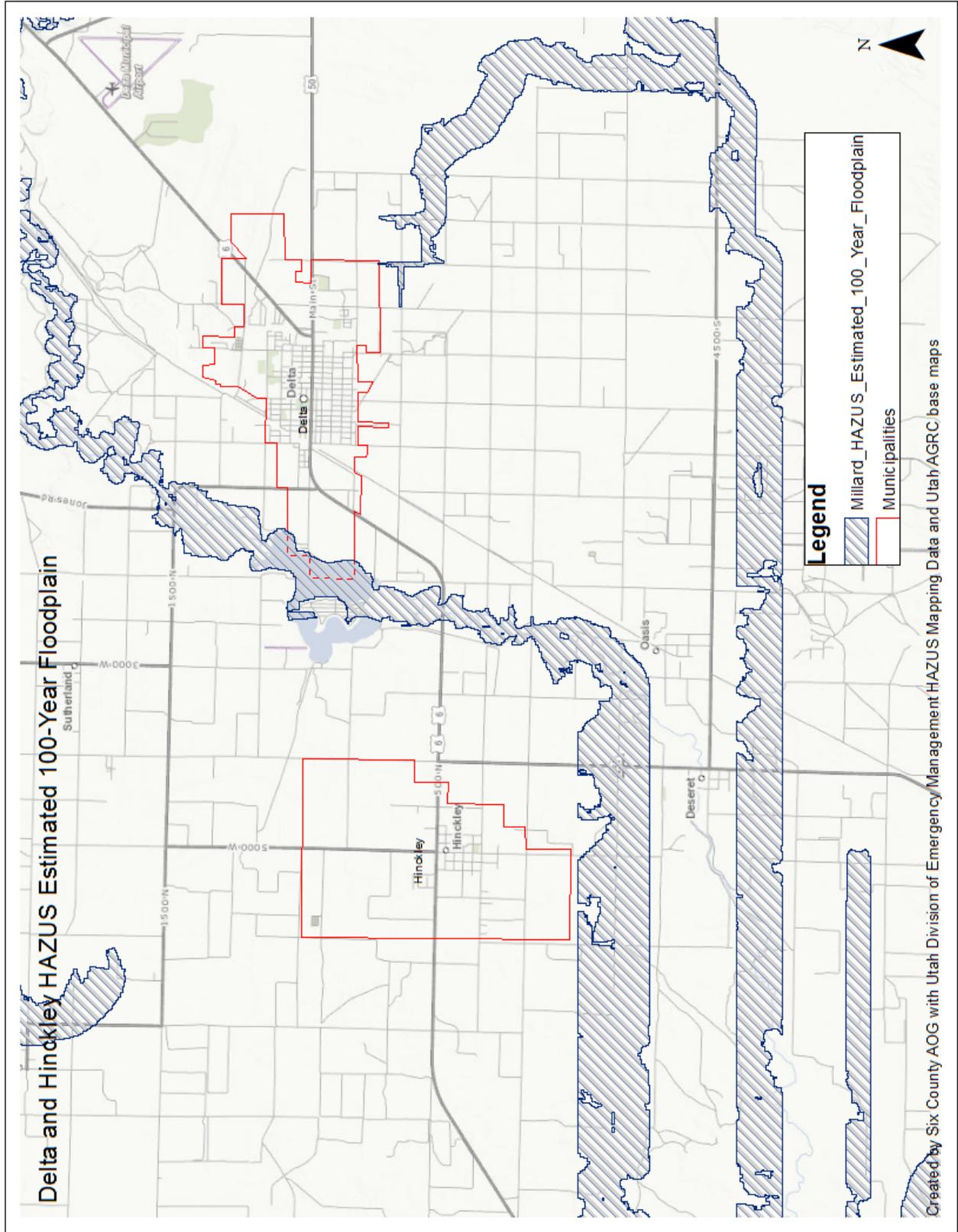
a. None.

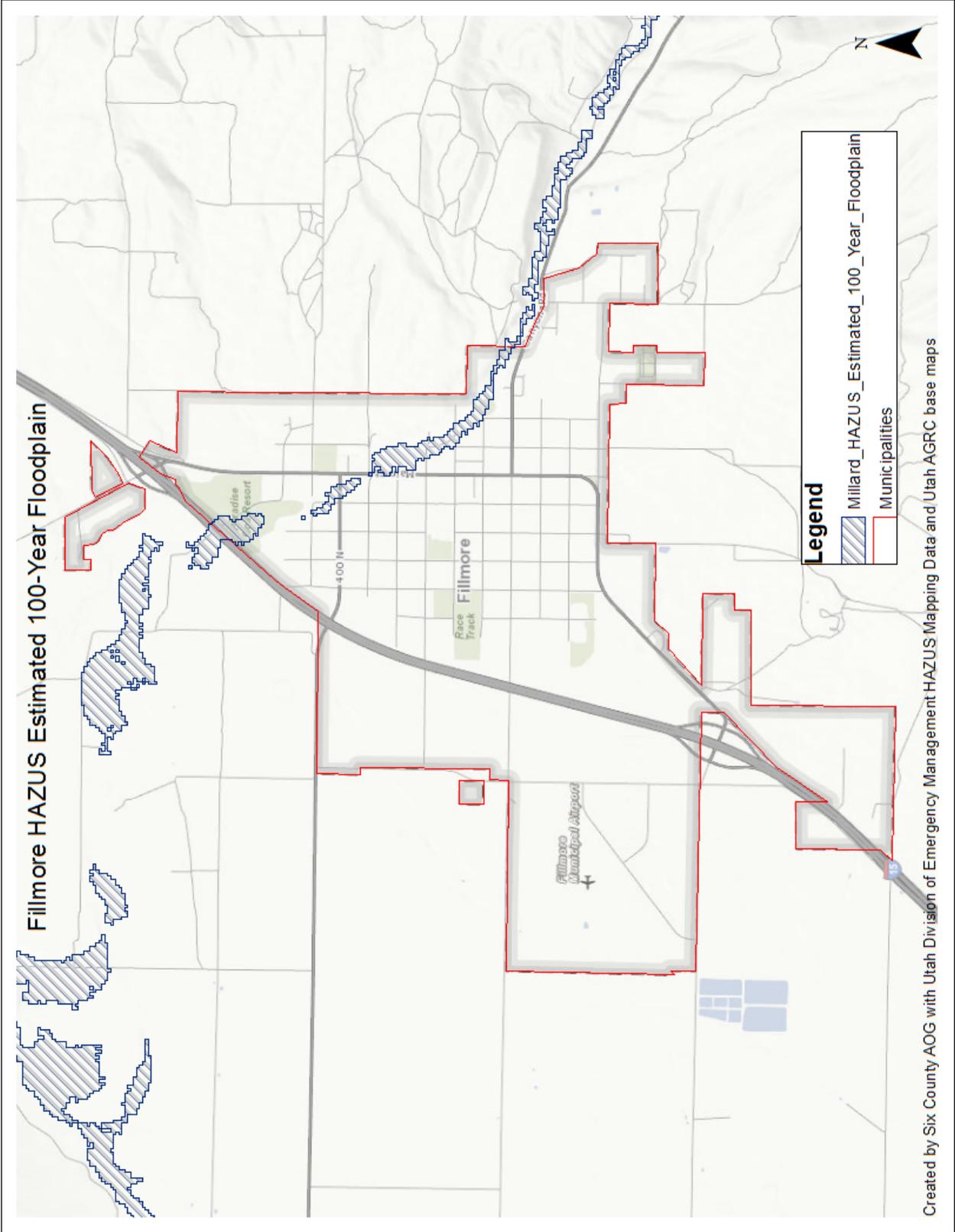
APPENDIX II: OTHER AGENCY RESOURCES

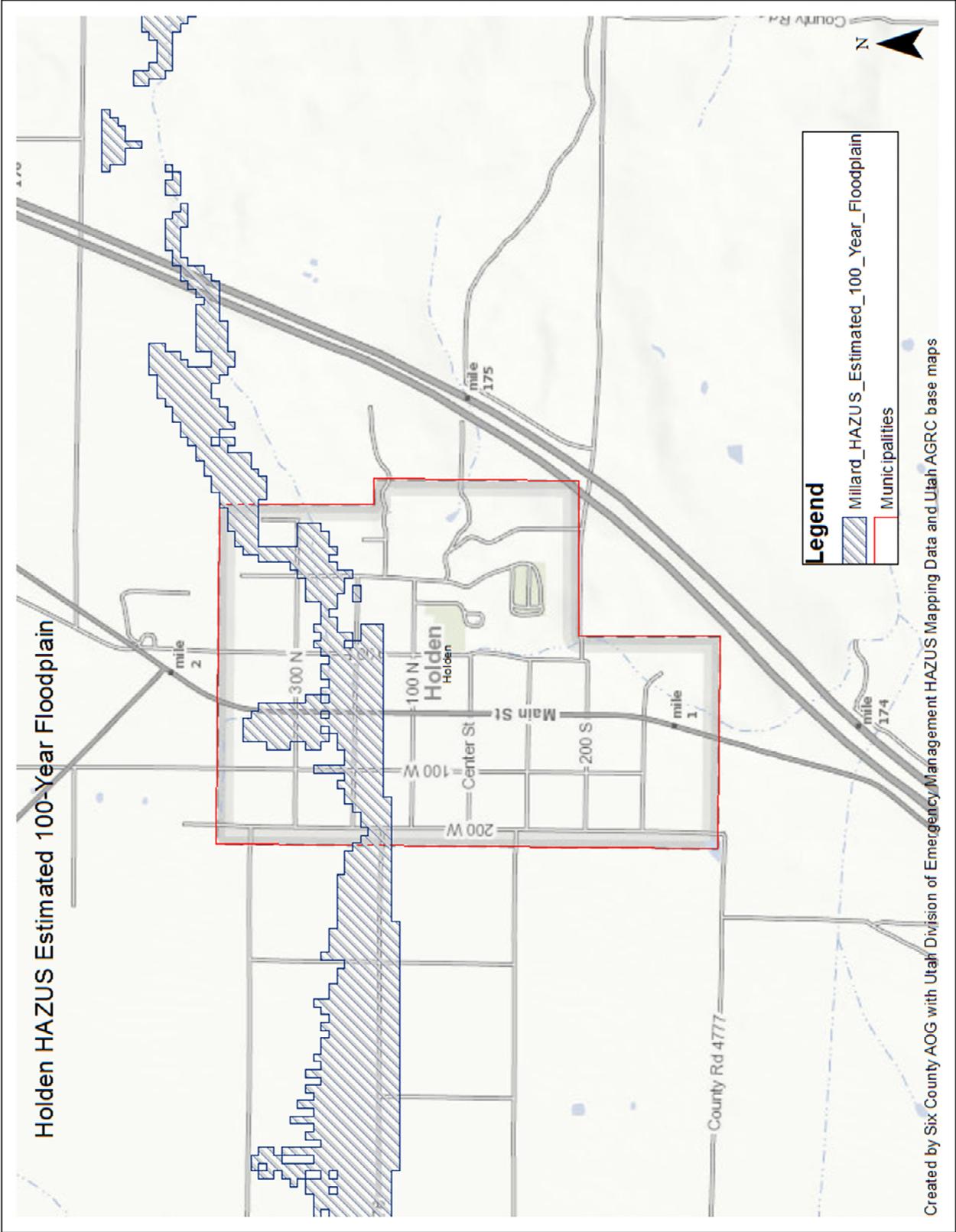
Mitigation and risk reduction:

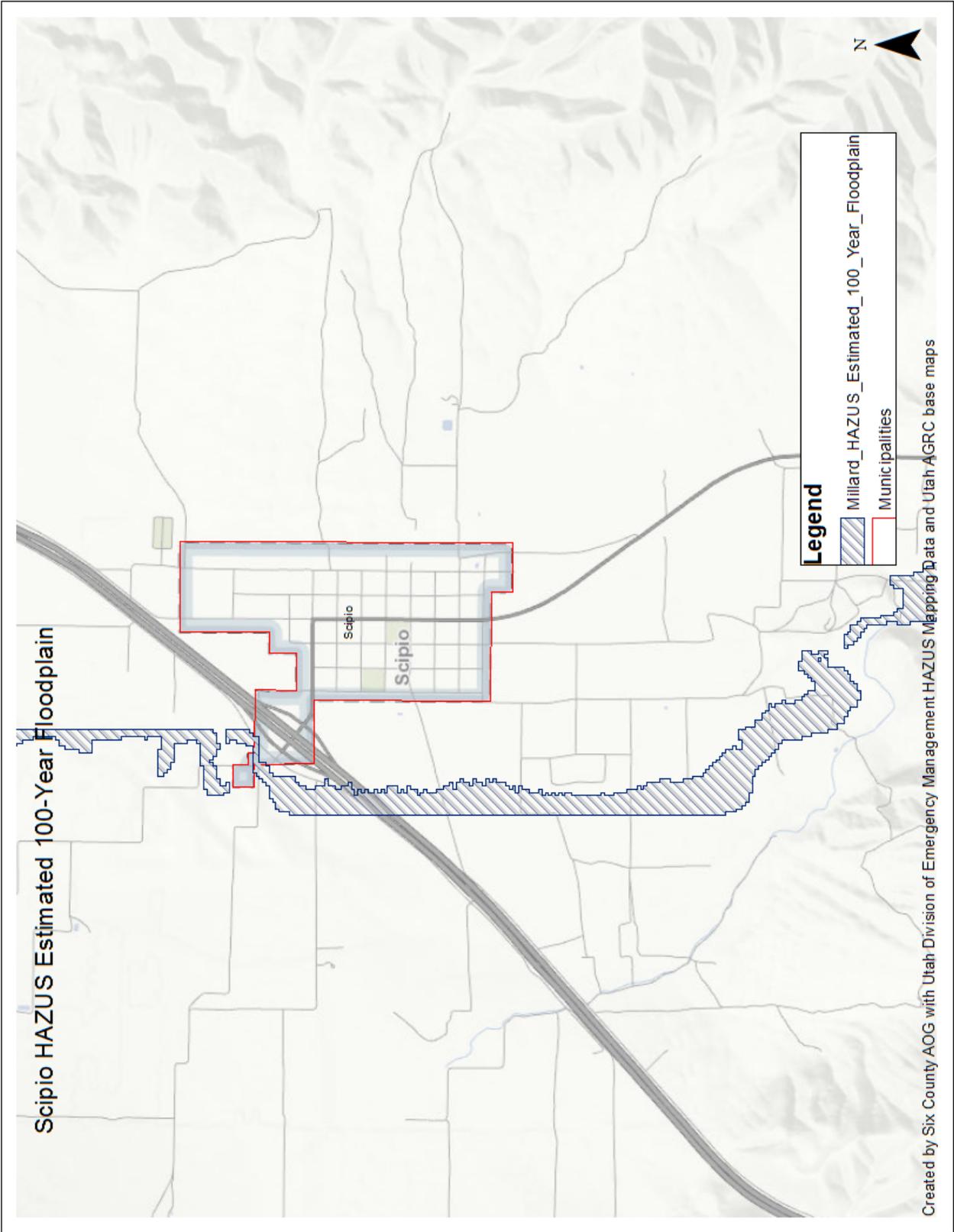
1. Millard County Social Services: Temporary assistance to needy families, food stamps, medically needy programs, adult services, homeless assistance, family planning, etc.
2. Army Corps of Engineers: Water and dam management within the county. Provide technical expertise, sandbags, and heavy equipment.
3. Utah Highway Patrol: Situation and damage assessment; provide transportation resources for movement of state personnel, supplies, and equipment to include air and ground reconnaissance; traffic control.
4. State Fire Marshal: Hazmat route utilization; HAZMAT technical assistance; situation and damage assessment.
5. Forestry, Fire & State Lands: Debris removal from recreational facilities; technical assistance; situation and damage assessment.
6. Utah Division of Wildlife Resources: Technical assistance; debris removal from recreational facilities; facility improvements; situation and damage assessment.
7. State Radio Communications: Exercise readiness of warning systems and communication support.
8. Department of Agriculture: Assists with situation and damage assessment; coordination with USDA; HAZMAT technical assistance; state land use program.
9. Department of Workforce Services: Situation assessment and administration of disaster unemployment assistance programs.
10. Human Services: Insure liaison with private relief agencies for disaster victims.
11. State Historical Society: Project screening and situation assessment.

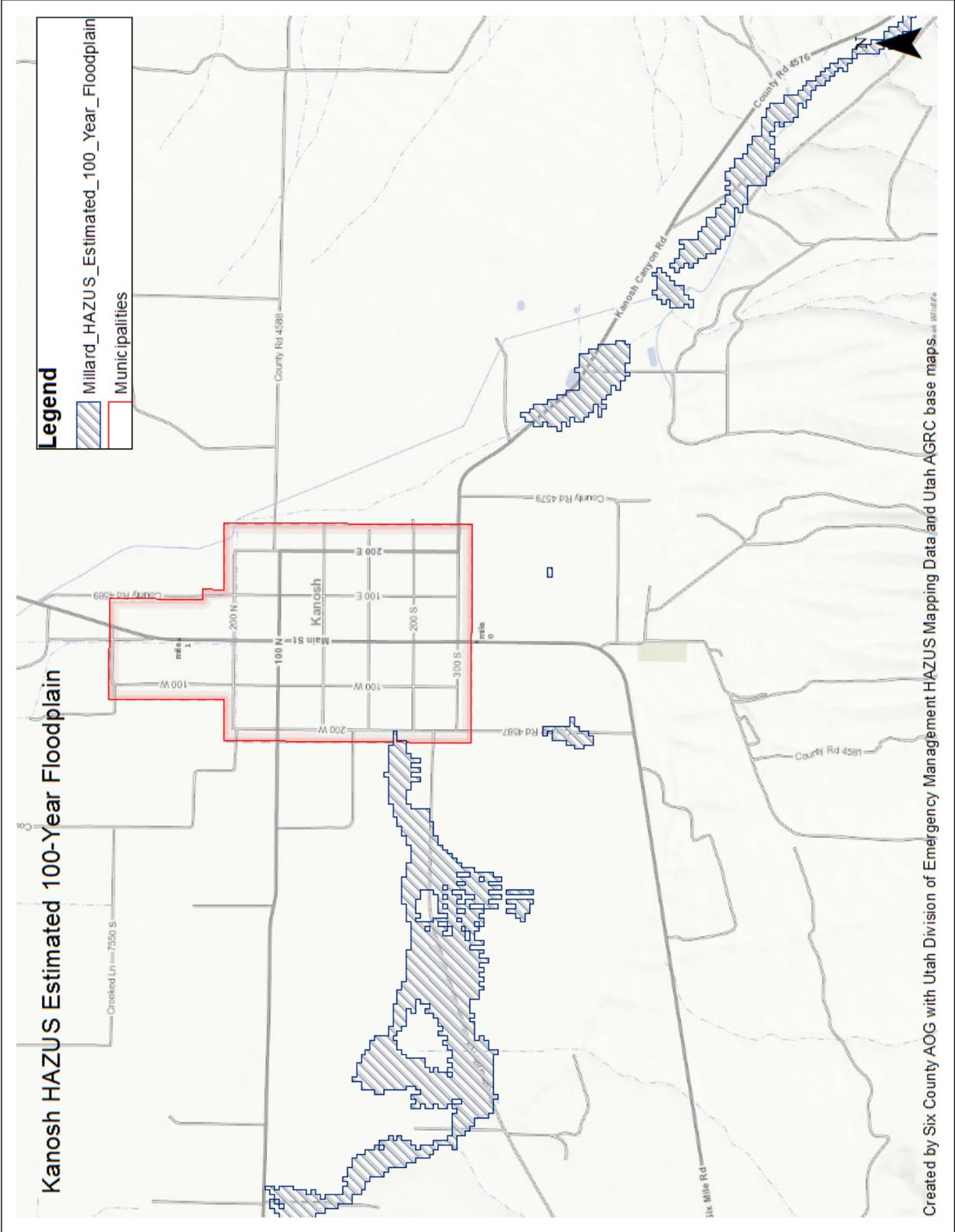
APPENDIX III: 100-YEAR FLOODPLAIN MAP









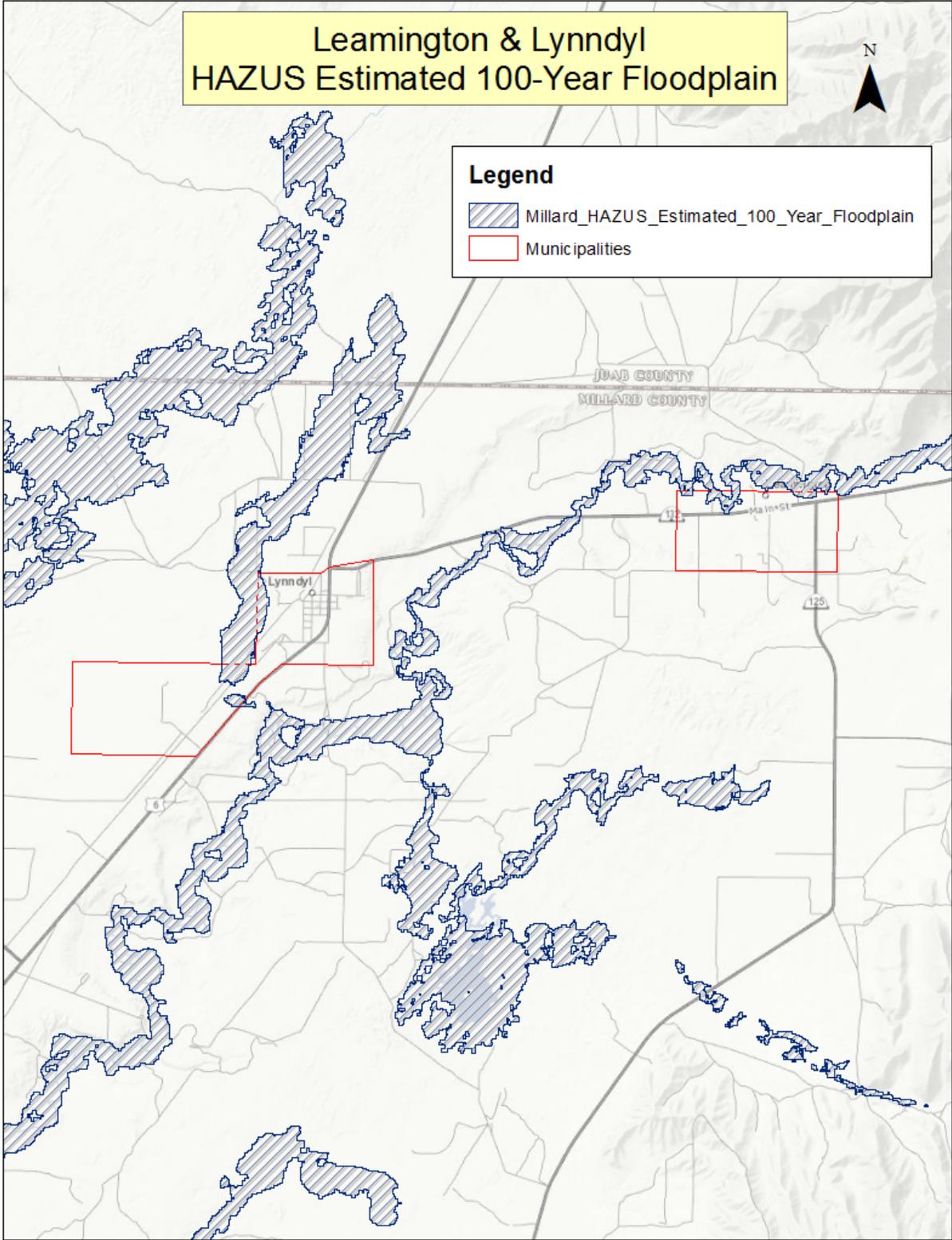


Leamington & Lynndyl HAZUS Estimated 100-Year Floodplain

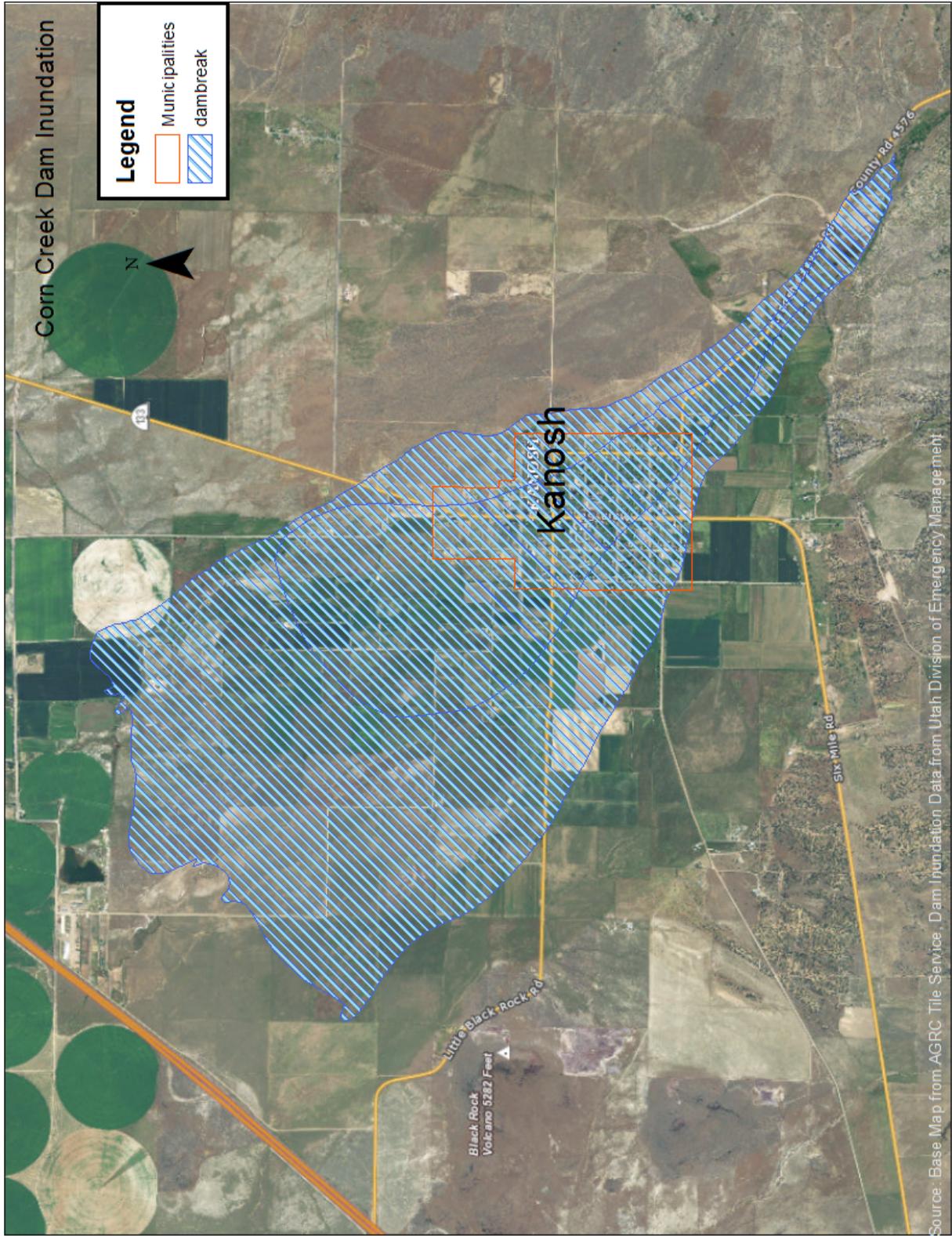


Legend

-  Millard_HAZUS_Estimated_100_Year_Floodplain
-  Municipalities



APPENDIX IV: DAM INUNDATION MAPS

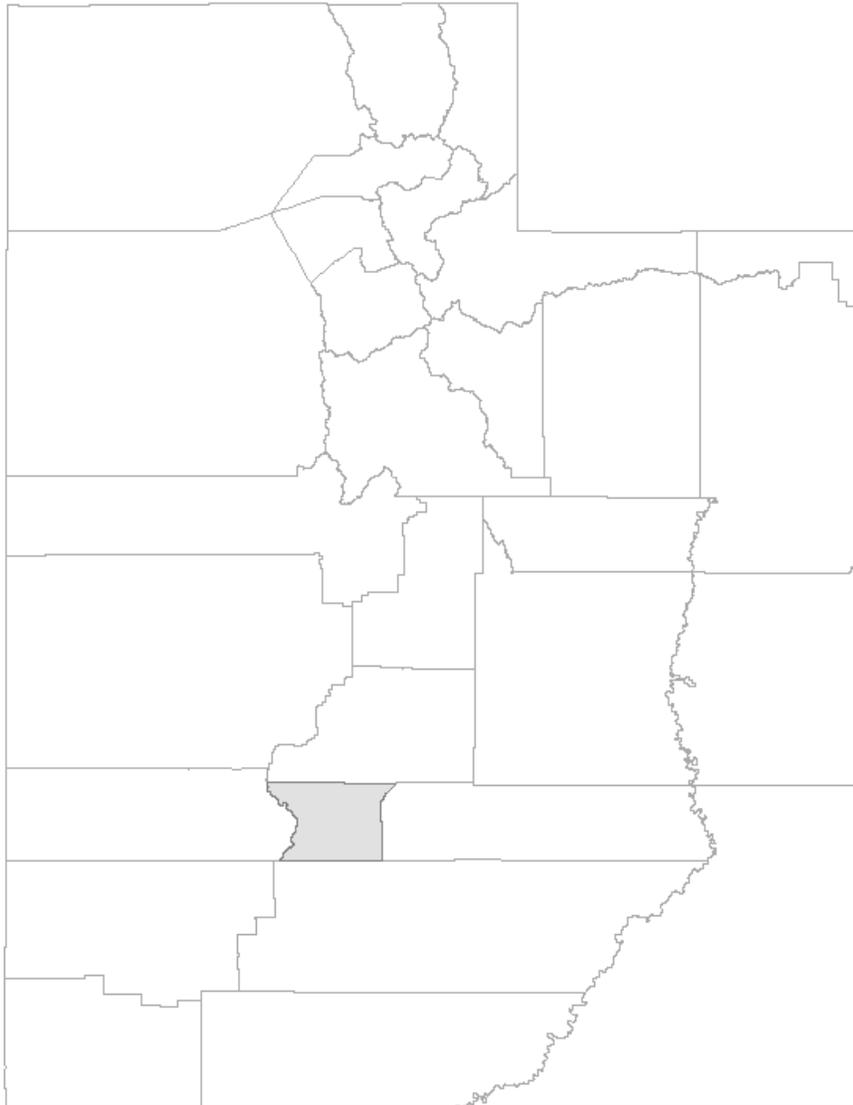


APPENDIX V: CLASSIFICATION SYSTEM OF HAZARDS

Hazard Summary Classification System:	
TERMS	DEFINITIONS
LOCATION	
Negligible	less than 10 percent of planning area or isolated single-point occurrence
Limited	10 to 25 percent of planning area or limited single-point occurrence
Significant	25 to 75 percent of planning area or frequent single-point occurrences
Extensive	5 to 100 percent of planning area or consistent single-point occurrences
EXTENT (MAGNITUDE/STRENGTH BASED ON HISTORIC EVENTS OR FUTURE PROBABILITY)	
Weak	limited classification on scientific scale, moderate speed of onset or moderate duration of event resulting in little to no damage
Moderate	moderate classification on scientific scale, moderate speed of onset or moderate duration of event resulting in some damage and loss of service for days
Severe	severe classification on scientific scale, fast speed of onset or long duration of event, resulting in devastating damage and loss of services for weeks or months
Extreme	extreme classification on scientific scale, immediate onset or extended duration of event, resulting in catastrophic damage and uninhabitable conditions
PROBABILITY	
Unlikely	less than 1 percent probability of occurrence in the next year or a recurrence interval of greater than every 100 years
Occasional	1 to 10 percent probability of occurrence in the next year or a recurrence interval of 11 to 10 years
Likely	10 to 90 percent probability of occurrence in the next year or a recurrence interval of 11 to 100 years
Highly Likely	90 to 100 percent probability of occurrence in the next year or a recurrence interval of less than 1 year
OVERALL SIGNIFICANCE	
Low	two or more criteria fall in lower classifications or the event has a minimal impact on the planning area. This rating is sometimes used for hazards with a minimal or unknown record of occurrences or for hazards with minimal mitigation potential
Medium	the criteria fall mostly in the middle ranges of classifications and the event's impacts on the planning area are noticeable but not devastating. This rating is sometimes used for hazards with high extent rating but very low probability rating
High	the criteria consistently fall in the high classifications and the event is likely/highly likely to occur with severe strength over a significant to extensive portion of the planning area

Piute County

Natural Hazard Assessment for Pre-Disaster Mitigation



Prepared by: Emery Polelonema, Six County AOG Planning
3-18-2015

Contents

Introduction.....	1
Background Information.....	1
Capability Assessment.....	2
Piute County Capabilities	2
Marysvale Town Capabilities	2
Junction Town Capabilities.....	2
Circleville Town Capabilities	2
Kingston Town Capability	3
Critical Facilities.....	4
Piute County Flooding	5
History of Flooding in Piute County.....	5
Flood Assessment for Piute County.....	6
Location and Extent	7
Piute County Wildfires	8
History of Wildfires in Wayne County.....	8
Wildfire Assessment for Piute County	8
Location and Extent	8
Piute County Landslides	10
History of Landslides in Piute County.....	10
Landslide Assessment for Piute County	10
Location and Extent	10
Piute County Earthquakes.....	11
History of Earthquakes in Piute County	11
Earthquake Assessment for Piute County.....	11
Location and Extent	11
Piute County Dam Failure	13
History of Dam Failure in Piute County	13
Dam Failure Assessment for Piute County.....	13
Extent and Location	13
APPENDIX I: COUNTY CAPABILITIES.....	i
APPENDIX II: COMMUNITY CAPABILITIES	x
Marysvale Town Capability Assessment.....	x
Junction Town Capability Assessment	xii
Kinston Town Capability Assessment.....	xiv
Circleville Town Capability Assessment.....	xvi
APPENDIX III: OTHER AGENCY RESOURCES.....	xix
APPENDIX IV: 100-YEAR FLOODPLAIN MAPS	xx

Introduction

This document is an overview of natural hazards in Piute County. It tells about the history of hazards in the county and defines present and future projected risks. It serves as an annex of the general SCAOG Regional Pre-Disaster Mitigation Plan and is divided into sections covering the following hazard topics: flooding, wildfires, landslides, earthquakes, and dam failure. Each section contains information about the history of the hazard, and an assessment of the extent and location of the hazard. Piute County Emergency Manager Matt Whitaker was contacted for information about the county's hazard planning. All municipalities were contacted for information about their area.

Background Information

Approximately 67,015 acres or 14% of the total land area in Piute County is privately held and outside the incorporated areas is almost entirely vacant. The other 86% is owned by the state or federal governments and aside from extractive industry is beyond the reach of development.

The vast majority of landslides, debris flows and wildfires occur on these public lands with virtually no impact on development. Of the privately held land, most is not developable due to a lack of water and county zoning requirements of water access and a minimum of 5 acres per house. Other limitations include steepness of the terrain, flash flood plains and accessibility. There is still plenty of infill within town limits that can be utilized for safe development without developing in unincorporated, sparsely populated, or hazardous areas. For example, Marysvale (population, 408) has one of the largest geographic areas within its boundaries in the state.

Piute County requires UBC on all new or proposed buildings. New subdivisions require a grading and drainage plan to mitigate any flooding, which may occur. Since most of the privately held land is along the relatively safe and accessible US 89 corridor, development is occurring in this general area.

Historically, Marysvale and Kimberly further west were mining towns cashing in on the gold found in the area in the late 19th and early 20th centuries. Kimberly is now a ghost town and Marysvale survives on agriculture, tourism and service sector business. Transportation development had its beginnings in the original wagon trails, which brought the pioneers to this area. US 89 follows these original trails and serves as a major historical corridor in the state running through the county north to south. This corridor is where future development is likely to happen because of the private lands along this highway. Except for lands adjacent to the Sevier River and Otter Creek and their tributaries, this corridor is relatively safe from natural hazards.

Figure 4-1: Incorporated Piute County Communities

- **Marysvale**
- **Junction**
- **Circleville**
- **Kingston**
- **Piute County**

Capability Assessment

A capability assessment looks at “safeguards” that jurisdictions have in place to prevent or mitigate disasters. These measures include: planning and regulatory policies, administrative and technical roles, tax and funding resources, and educational/outreach programs. For more specifics about capabilities please see Appendices II and III on county and community capabilities.

Piute County Capabilities

Piute County has several different agencies which support mitigation actions. The Emergency Management of the county helps coordinate mitigation and risk reduction. This group also works with Six County AOG in the making of the mitigation plan. The County Highway Department also works to mitigate risk by making sure roadways are properly maintained with proper equipment to prevent flooding and overflow. Central Utah Public Health acts as a state agency but assists with preventing health hazards in the case of a disaster. The County Sheriff’s Department is responsible for law enforcement in unincorporated areas and smaller towns without departments. It works with the Piute County in being a response to emergencies. Educational outreach is provided by the Utah State University Extension Service. It provides agricultural and environmental information in dealing with drought and winter storms. It coordinates with Piute Emergency Management and Public Health. A more detailed list of agencies and their roles can be found in Appendix II- Capabilities of Counties.

Marysvale Town Capabilities

Although there are no planning documents for Marysvale Town (except through SCAOG regional planning), the town has rudimentary subdivision ordinances which are effective in reducing development in hazard prone areas. Retention and detention ponds are identified as possible projects to mitigate future flooding on west side of the town. Emergency volunteers are supplemented through state funding to respond to natural disasters, but are limited in providing mitigation planning. They draw funding for hazard mitigation from state funding and using county resources. Education and outreach is conducted by Piute County.

Junction Town Capabilities

The town’s Capital Improvements Plan addresses hazards, and identify projects that can be included in the mitigation strategy. There is also a siren warning system in place. They can draw money from impact fees and CIB for mitigation projects. The town works with Piute County to provide EMS and police services. The EMS providers and the local town council also provide education and outreach to the community about emergency preparedness. Monthly committee meetings are conducted with other emergency committee members, which includes Mayor Rick Dalton.

Circleville Town Capabilities

Hazards are identified the town’s local capital improvements (CIP) lists and this year will obtain funds to remove Sevier River’s sand bars to eliminate flooding caused by frozen river. Their general plan and capital improvement plan does comprehensively address hazards. Flooding inundates the main street which has inadequate slope and drainage capacity. Building permits are conducted on a one-on-one basis for construction which allows the town to protect it citizens

from flood zones and other conditions. The city has a warning siren located at the firehouse. There are several places which the community is able to draw funding from for hazard mitigation including taxes, impact fees, and federal and state grants. The town participates in Piute County's EMS activities.

Kingston Town Capability

The town's hazard include upstream in Kingston Canyon a flooding hazard. High water primarily inundates approximately 50 acres of farmland. The town's general plan is not complete and they participate in the county's emergency management program. Kingston uses primarily county resources for emergency planning. No revenue is drawn money from taxes, utility or impact fees for hazard mitigation but may be available via state and federal funding. The town has a local warning system. They do have ongoing education and outreach for the community provided by the county.

Critical Facilities

Critical facilities are given special consideration when planning mitigation projects: They are the activities and facilities that even a slight chance of a hazard is a great threat. Critical facilities include hospitals, fire stations, police stations, critical records, water treatment, and other similar facilities. Juab County and each of its community were asked to list their critical facilities and define what natural hazards pose the greatest risk to each facility. The following charts outline information given by the municipalities of their critical facilities and what natural hazards posed the greatest threat to these facilities.

Table 4-2: Critical Facilities		
Critical Facilities	Greatest Risk	History of Damage
Kingston Town Critical Facilities		
Secondary diversion Irrigation Firehouse Town hall Post office Well and spring Well building	Flooding Earthquake	2009- Flood damage, spring high-water 1983 Flooding- Affected culinary water
Piute County Critical Facilities		
Elementary Schools – Marysvale & Circleville Piute High School - Junction Gas Stations –Marysvale & Junction Grocery Stores –Junction, Circleville, & Marysvale County Building - Junction	Earthquake Fire Flooding	Dams have been to capacity and overflowing (East Junction Town) Highways have been flooded out Flooding of Sevier River due to freezing (Bridge NE of Circleville)
Circleville Town		
School Firehouse Clinic Grocery store Town hall		
Junction Town		
Water System	Earthquake	
Marysvale Town		
School LDS church (cultural hall serves as shelter) Town Hall		

Piute County Flooding

History of Flooding in Piute County

Piute County has recently experienced impacts related to flooding. The Sevier River meanders through the county and most flooding occurs along this river. Historically, based on the flooding which occurred during the spring of 1983 and 1984 both as a result of rapid snow melt events, experience would suggest these events would appear to be a greater hazard than cloudburst storms. Yet serious hazards could result from either storm. Lands most at risk to flood are adjacent to the Sevier River and Otter Creek and their tributaries.

Circleville Town was flooded in 2012 due to the Sevier River's layered freezing. Marysvale has an extensive history of flooding from Bullion (Pine) Creek.

According to 2013 SHEL DUS data, between the years of 1980-2012 there has been in Piute County a total property loss of \$143,123 and in crop damage, \$60,293 were lost. That is a total (based on current Census 2010 population of 1,556) per capita loss of \$131. Washington County which ranked first in total loss only had a per capita loss of \$2,813, and Salt Lake County, ranking second in total loss, had a per capita loss of \$50.

Piute County is remote and only has maintained a low population. The County receives less overall federal funding to deal with infrastructure projects to mitigate flood disaster. The monetary cost to the public due to flooding in Piute County makes this a significant hazard. The 2014 State of Utah hazard assessment put out by the DEM designates Piute County as a low flood hazard zone, based off of the former local hazard mitigation plan. This 2015 update to the Piute County Assessments recommends that flooding be considered a more critical concern for Piute County based on historic costs per citizen and the future threat of flooding, which will be addressed in the next section.

Table 4-3: Piute County Flood History

Date	Location	Critical Facility or Area Impacted	Comments
July 7, 1949	Marysvale	Extensive flood damage to highway in Marysvale Canyon.	
July 18, 1965	Marysvale	U.S. 89 damaged	
August 6, 1967	Kingston	Highway 22 damaged	Source Kingston Canyon
July 24, 1968	Marysvale	Damage to homes, crops, and U.S. 89.	
1983	Marysvale	Damaged roads, bridges, culverts, and agricultural interests.	Source: Kingston, Bullion, and Cottonwood Canyons. Presidential Declared Disaster
August 22, 1997	Kingston Canyon	Damage to roads, waterlines, and stream channel.	Monsoonal thunderstorm in Kingston Canyon. 1 fatality
August 9, 1997	Marysvale	Property damage \$36,286	Bullion Canyon
August 5, 1998	County wide	Crop/Property damage \$1,264 /\$7,695	
July 13, 2007	Marysvale	Property Damage \$52,616	Bullion Canyon
January 11, 2005	UTZ017-019	See comment	.5 injuries .08 fatalities
May 25, 2005	UTZ004-004-016>018	Property Damage \$2,982	

Sources: Flood Hazard Identification Study of SCAOG, by USACE, Utah Division of Emergency Services and Homeland Security, August 2003; Correspondence with communities and county. SHELDUS™ U.S. version 13.1 which includes county level hazard loss data from 1960-2013

Flood Assessment for Piute County

Table 4-4: FEMA Hazard Profile for Floods in Piute County

Probability of Future Occurrences	Likely: 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years.
Severity	Limited
Location	Flooding would occur in and along flood plains.

Seasonal Pattern	Piute County’s main flooding threat is from snowmelt runoff during spring months.
Duration	The type of event determines the duration of flooding; flooding due to summer thunderstorms can last a couple of hours and flooding due to spring runoff can occur for weeks.
Speed of Onset	Six to twelve hours.

Location and Extent

In terms of property damage and disruption of community life, some of the towns along the Sevier have been impacted by high water. Storms can produce flash floods, snowmelt floods, post wildfire/damaged watershed floods, and severe winter weather. Three of the four incorporated communities in Piute County that have a relatively minor risk of flooding from the Sevier River and its tributaries - Circleville, Junction, and Kingston.

The municipalities of Marysvale, Junction, Kingston, and Circleville participate in the National Flood Insurance Program (NFIP). There has been no Flood Insurance Studies done for any of the communities, even those participating in the NFIP. Even so, there are Flood Insurance Rate Maps (FIRM) for Marysvale and Junction Towns. They have not been updated since the 1970’s. These maps can be found on the website of FEMA through the Flood Map Center (<https://msc.fema.gov>).

An August 2003 report titled Flood Hazard Mitigation Study of the Six County Association of Governments by the U.S. Army Corps of Engineers was completed to help communities without floodplain data. This study generally identified areas of concern for municipalities and county. However, this report only intended to give communities very general estimates of where flood risk may exist.

Floodplain maps were created by the Utah Division of Emergency Services. They used HAZUS, a loss estimation program, to create a 100-year floodplain computer simulated scenario. This means that it looked at the flooding impact with a 1% chance of flooding in any given year. These floodplain zones could pose a potential risk to residents and their property, and included in this analysis. For maps of these floodplains created by the state please see Appendix IV.

Marysvale has an extensive history of flooding from Bullion (Pine) Creek and a high future flood threat - even greater than that depicted on the FEMA’s data. The 100-year flow has been estimated at almost 900 cubic feet per second. There are also smaller threats from Beaver Creek on the north side of town and California Gulch through the center of town.

Assessing Vulnerability: Addressing Repetitive Loss Properties

There are no repetitive loss properties in Piute County (FEMA, 2014).

Piute County Wildfires

History of Wildfires in Wayne County

There were 93 wildfire starts reported in Piute County between 1973 and 2005. Most of those occurred in the Tushar Mountains located western portion of the county near Marysvale, Junction; and Circleville, or in the Sevier Plateau/Grass Valley/Otter Creek area, located in the northwestern portion of the county (Central Utah Wildfire Protection Plan, 2007).

Wildfire Assessment for Piute County

Probability of Future Occurrences	Occasional: 1 to 10 percent probability of occurrence in the next year or a recurrence interval of 11 to 100 years.
Severity	High in the Urban-Wildland Interface.
Location	Entire county except cultivated fields.
Seasonal Pattern	Most wildfires affecting Piute County occur during mid to late summer months (fire season).
Duration	The amount of time needed to contain a wildfire depends on a variety of uncontrollable variables such as: wind speed, relative humidity, type, and moisture content of fuel, weather, and topography. Thus containment time varies for each fire.
Speed of Onset	0 to 6 hours is the minimum amount of time given to homeowners in order to evacuate.

Location and Extent

A list of Regional Recommendations and Priorities may be found in the Central Utah Regional Wildfire Protection Plan (CWPP), May 4, 2007. The Utah Division of Forestry, Fire, and State Lands is also putting together a forthcoming a wildfire assessment for the Six County Region. More information can also be found in the Utah Division of Emergency Management State Hazard Mitigation Plan 2014 update.

Kingston, Marysvale, and Little Meadow (a recreational community found near Otter Creek), have been identified by the State of Utah as communities at risk from wildfire. Marysvale/Bullion Canyon has a completed CWPP. Kingston also has a watershed at risk from wildfire. The communities of **Junction, and Circleville** were considered high risk wildfire communities.

Monroe Mountain, a combination of Manning Meadow, Monroe Meadow and Long Flat all identified as communities at risk comprised of approximately 75 homes located in both Piute and Sevier counties has also completed a CWPP. **Greenwich and Angle Unincorporated Communities** are located adjacent to a high risk wildfire areas i.e. Parker Mt. and the Monroe Mt. Range; and have few inhabitants.

Watershed areas are of concern because of the potential for flooding, debris flow and degradation of municipal watershed water quality following wildland fire. Flooding is a concern along the Sevier River, Otter Creek, and their tributaries, Pine Creek, City Creek and Rocky Ford Creek. Spring runoff or precipitation summer thunderstorms can cause post-wildfire flooding (SCAOG 2004). Marysvale, Kingston, and Circleville are located in the floodplain and thus could be at risk from post-fire flooding.

Piute County has a total of 557.5 square miles in extreme or high hazard wildfire areas. There are about six people per acre in extreme high and wildfire risk areas in Piute County. There are seven out of the nine assessed communities by the Utah Division of Forestry and State Lands as being in a wildland urban interface (WUI). This designation refers to the zone of transition between urban areas (where there is a concentration of people living) and wildland. Communities that are within 0.5 miles of this zone are included. These areas are at risk of wildfires.

Community name	Fire Occurrence	Fuels hazard	Values Protected	Fire Protection Capability	Overall Score*	Notes
Circleville	2	1	3	2	8	
Dog Flat	2	3	2	3	10	Was Sevier County
Junction	2	1	3	2	8	
Kingston	2	2	3	2	9	Watershed at Risk
Little Meadow	2	3	3	3	11	
Marysvale	2	3	3	2	10	

Source: (Utah Division of Forestry, Fire, and State Lands 2013)
<http://www.ffsl.utah.gov/images/Fire/wui/2013CARsFinalList.pdf>
 *These scales ranges from 1 (least) to 3 (most).
 **The Overall Score ranges from 0 (No Risk) to 12 (Extreme Risk).

Piute County Landslides

History of Landslides in Piute County

In 1983 and 1984 the county experienced damage causing landslides as the result of flooding and severe rain storms. There was a total property damage between the two years of 23,422,081 (2013 adjusted) (SHELDUS National Hazard Data)

Landslide Assessment for Piute County

Probability of Occurrence	Likely: 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years.
Severity	Negligible
Location	Mass wasting in Piute County is located predominately along the canyons along the Tushar Mountains (see Map 3.1 on p.22 of this Annex).
Seasonal Pattern	Landslides most often occur within Piute County during spring months with higher than normal amounts of precipitation.
Duration	Several months
Speed of Onset	No warning

Location and Extent

Landslides have not been a common problem in Piute County. US Highway 89 is located in the county connecting to Interstate 70 on the north region and may encounter debris flow. State Route 62 east of Kingston Town may also have the same situation. Many residents live in unincorporated areas (e.g. Elbow Ranch & Thompsonville) of Piute County on benches of the mountains surrounding incorporated communities. These areas are at the most risk.

According to the State Hazard Mitigation Plan, approximately 361.7 square miles are within areas of high or moderate landslide susceptibility areas. This is about 47% of the county.

SR 62, U.S. 89 & other minor state routes total about 13.6 miles that are in a historic landslide zones. The communities of Piute County consider landslides to be a rare and unlikely occurrence.

Piute County Earthquakes

History of Earthquakes in Piute County

On October 4, 1967, a magnitude 5.2 earthquake caused damage in the Marysvale area. Ceilings and walls cracked in numerous houses in Marysvale. About one mile north of Marysvale, well-water was badly muddied for 24 hours. Rockslides were reported in the Joseph, Junction City, and Sevier area. (USGS - Abridged from Earthquake Information Bulletin, Volume 9, Number 4, July - August 1977, by Carl A. von Hake).

Date	Location	Critical Facility or Area Impacted	Comments
October 4, 1967	Marysvale	Private property damage in Marysvale; US hwy 89 damaged by rockslide in Marysvale canyon	5.2 magnitude on Richter scale
November 4, 1974	Marysvale	unknown	3.8 magnitude

Sources: Utah Division of Emergency Services and Homeland Security, August 2003; Correspondence with communities and county.

Earthquake Assessment for Piute County

Probability of Occurrence	Occasional: 1 to 90 percent probability of occurrence in the next year or a recurrence interval of 11 to 100 years
Severity	Catastrophic
Location	Ground shaking will be felt throughout the entire county if a large earthquake were to occur. Surface fault rupture could be expected in areas of known historic fault movements. Liquefaction is expected in areas of high to moderate liquefaction potential, which covers a vast portion of Piute County.
Seasonal Pattern	None
Duration	Actual ground shaking will be under one minute yet after-shocks may occur for weeks after.
Speed of Onset	No warning

Location and Extent

In 2009 the Utah Division of Emergency Services ran a scenario model for the Richfield segment with magnitude of 6.9. They used HAZUS software for this, which uses a standardized methodology that contains models for estimating potential losses from disaster. It was developed

by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. In 2010, FEMA Region VIII performed an analysis on earthquake losses for buildings. The following charts demonstrate data on various issues from a 6.9 earthquake. GIS analysis was also performed for the areas surrounding Richfield, to estimate potential damage. Piute County falls into the outliers of impact.

According to Utah Division of Emergency Services HAZUS analysis, Piute County would be impacted by an earthquake in Richfield. Although the extent of this damage would be minimal. In the case of an earthquake with a 6.5 Magnitude, it is estimated that there would be no casualties. Direct economic losses for buildings in Piute were expected to be \$3,000. And non-structural damage was estimated to be at \$9,000, for a total loss of \$11,000. This all translates to a per capita loss of \$7.20.

Piute County Dam Failure

There are six active dams located in Piute County, as designated by the Utah Division of Water Rights (UDWR). Many of these dams are detention ponds or livestock watering facilities.

Of the active dams, none are designated as a “low hazard” by the UDWR. As defined by state statute, low hazard dams are those dams which, if they fail, would cause minimal threat to human life, and economic losses would be minor or limited from damage sustained.

Two dams, Barney Lake and Manning Meadow, are considered “moderate hazard”. Moderate hazard dams are those that if they fail have a low probability of causing loss to human life, but would cause appreciable property damage including damage to public utilities.

There are four dams that are designated as “high hazard”. They are the Lower and Upper Box Creek dams, Otter Creek dam, and Piute Dam. A “high designation” means that if they fail there is a high probability of causing loss to human life or extensive economic loss, including damage to critical public utilities.

Dam failure inundation maps and emergency action plans for each of the high risk dams can be found on the UDWR’s website at: <http://waterrights.utah.gov/cgi-bin/damview.exe?Startup>.

History of Dam Failure in Piute County

There is no history of major dam failures in Piute County.

Dam Failure Assessment for Piute County

Probability of Occurrence	Unlikely
Severity	Limited
Location	Would occur downhill from existing dams.
Seasonal Pattern	None
Duration	Depends on dam and type of break; Could be a wall of water which passes through in a few hours, or a slower break which could last for weeks.
Speed of Onset	6 to 12 hours.

Extent and Location

Upper & Lower Box Creek Dams

Lower Box Creek Dam is located north-west of the unincorporated community of Greenwich. Failure of this dam could potentially flood farmland and residences on the west side of town. Upper Box Creek dam has an identical pattern.

Otter Creek Reservoir

This dam is located nine miles east of Kingston Town and navigates adjacent to State Hwy 62. It has a high hazard rating. The inundation affects the communities Kingston and Junction Towns. The outlying agriculture would be flooded. Highway 32 is also affected south towards the Town of Antimony in Garfield County.

Piute Reservoir

Originally this reservoir was built in 1938 and is currently owned by Piute Reservoir & Irrigation Co. The dam is located downstream on the Sevier River from Marysvale at the north end of the Piute Reservoir. This dam provides a source of irrigation for agricultural purposes. The downstream flows adjacent to Hwy 89 navigating towards Sevier County Communities. If damaged, the eastern part of the Town of Marysvale would be flooded. Breakage of this dam would also flood the Sevier Valley and north to Fayette.

Moderate Hazard Dams

In addition to the four dams above Barney Lake and Manning Meadow pose a moderate risk to the unincorporated community of Thompson, which is located below Manning Meadow. Marysvale is 15 miles from Barney Lake.

APPENDIX I: COUNTY CAPABILITIES

A. Piute County Emergency Management

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
 - a. Coordinate emergency planning and response activities with numerous county agencies. Planning encompasses preparedness, response, recovery, and mitigation.
 - b. Responsible for everyday operations of the county's Emergency Operations Center.
 - c. Update and exercise emergency operations and mitigation plans.
 - d. Coordinate state sponsored training for county agencies including; law enforcement, public health, social services, fire departments, emergency medical services, etc.
 - e. Coordinate the county's Local Emergency Planning Committee. (meets quarterly)
 - f. Coordinate the county's Tier Two reporting. (hazardous materials)
 - g. Public awareness and educational programs via newspapers, radio, and schools to decrease vulnerability to hazards.
 - h. Work with schools and local businesses to help create site-specific hazard response plans and present in-service education to local business employees.
 - i. Responsible for timely and effective public information releases during emergency situations.
 - j. During a disaster declaration, emergency management has all county resources at their disposal including manpower, communications, and equipment.
 - k. Have verbal mutual aid agreements with Juab, Millard, Sanpete, Sevier, and Wayne County Emergency Management Agencies for necessary resources during a disaster situation.
 - l. With effective planning, training, and exercising, emergency management can help to mitigate potential hazards within the county.

- m. Assist in damage assessment and coordinate with state and federal agencies for recovery assistance.
2. Responsibility and authority in the regulating, inspecting, or funding of projects:
 - a. In coordination with the Six County Association of Governments, assist with applications for federal and state funding such as the Hazard Mitigation Grant Program.
 - b. Involved with inspecting hazardous material storage sites and fulfilling Tier Two reporting requirements.
 - c. Participate in dam inspections with the Army Corp of Engineers.
 3. Leadership and coordination with other government agencies:
 - a. Local Agencies: Piute County Emergency Management coordinates with appropriate local agencies to ensure preparedness, response, recovery, and mitigation. These agencies include:

Piute County Commissioners, Piute County Road Department, Piute County Sheriff Department, and various other law enforcement, fire, communication, and emergency medical agencies.
 - b. Non-local Agencies: Piute County Emergency Management coordinates with numerous state and federal agencies. These agencies include the Utah Division of Emergency Services and Homeland Security, Utah Highway Patrol, State Health Department, Department of Transportation, and Federal Emergency Management Agency.
 4. General recommendations/Emergency Management concerns:
 - a. Provide listings of eligible mitigation projects so counties can be prepared when funds become available.
 - b. Warning systems and sirens are outdated and inadequate. At this time, funding is not available for improvements.
 - c. Piute County is constantly striving to improve planning and exercise activities and response capabilities.
 - d. County needs to add natural hazard mitigation to the General Plan and to the zoning and subdivision ordinances. Based on funding, Six County Planning Staff will work with the county to update the General Plan and the zoning ordinances to reflect natural hazard mitigation. Existing zoning requirements for flood plain management need to be enforced.

B. Piute County Highway Department *

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions)
 - a. Design bridges, culverts, and overflow sections. The County Highway Department follows a very detailed list of design standards for all projects within the county.
 - b. Continually working with the Utah Department of Transportation (UDOT) on various projects since the UDOT dispenses federal funding. While the UDOT provides technical advice concerning guidelines and standards, they do not provide equipment, materials, or personnel.
2. Responsibility and authority in the regulating, inspecting or funding of projects:
 - a. Responsible for and have authority to regulate and inspect all projects completed within the county.
 - b. All projects funded by the state or federal government are designed by a consulting engineer and meet the usual acceptable federal standards. Inspection of federal aid projects is the responsibility of the consulting engineering company and is overseen by the county to ensure standards are met. Many county projects are designed with in-house expertise and engineers are consulted if problems arise.
 - c. All funding in one-way or another comes through the county, whether it is a certain percentage of the federal aid project or 100% of the county projects.
3. Leadership and coordination with other government agencies:
 - a. Local Agencies: The County Highway Department has little interaction with other county agencies concerning roads and bridges. They do, however, coordinate with various county agencies concerning right of way and right of way purchasing. The legal aspect of right of way purchasing is overseen by the States Attorney's Office. The land values are usually developed by the Tax Equalization Office and approved by the County Commission.
 - b. Non-local Agencies: The County Highway Department coordinates with various State and Federal agencies for technical assistance, permitting, environmental concerns, archeological sites, and cultural issues. These

agencies include the Utah Department of Transportation, US Fish and Wildlife, Corp of Engineers, and the Utah Historical Society.

4. General recommendations/Emergency Management concerns:
 - a. Piute County Highway Department should assist local government with floodplain management and water development permitting.

C. Central Utah Public Health

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions)
 - a. Deal with bona fide health hazards using cause and effect in those areas for both mitigation and risk reduction. If it is a hazard affecting any number of persons and within the scope of public health, Central Utah Public Health (CUPH) will mitigate or exercise risk reduction through several methods ranging from enforcement of statutes to immunization programs.
 - b. Environmental Health has the knowledge and also access to the State Health Department for mitigation of incidents with hazardous or toxic wastes.
 - c. Programs include; waste water treatment, water pollution, public health nursing, immunization programs, solid waste regulation, food establishment inspections, air quality, and vector control.
2. Responsibility and authority in the regulating, inspecting or funding of projects.
 - a. CUPH Health is a unit of state government that operates through agreements or Memorandums of Understanding with the Utah Department of Health to enforce state public health statutes within the Six County district. Tax levies provide funding. There are no funding programs for non-operational programs.
3. Leadership and coordination with other government agencies:
 - a. Local Agencies: Within the scope of public health, CUPH coordinates with the following local agencies; Piute County Emergency Management, local law enforcement agencies (Piute County and county), local school boards, and planning and zoning agencies.

- b. Non-local Agencies: Within the scope of public health, CUPH coordinates with the following agencies; Utah Department of Health and state and federal law enforcement agencies.
- 4. General recommendations/Emergency Management concerns:
 - a. Public Health is normally under funded and understaffed at all levels of government. Should CUPH be called upon for expertise at a time of emergency or disaster, it normally does not have instrumentation for site level determinations of any kind without support from other agencies.
 - b. Public health agencies should be included in equipment storage; e.g., FEMA equipment "stored" and used at public health agencies, rather than being stored at a warehouse. For example, radio equipment that belongs to FEMA is based at county emergency management offices; the same could be done with air sampling equipment or other instruments/kits etc., which could be used by public health agencies both for daily work and at a time of emergency or disaster.

D. Piute County Sheriff's Department

- 1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
 - a. Responsible for law enforcement and criminal investigation in unincorporated areas of the county and in smaller towns that do not have police departments.
 - b. Provide standard law enforcement manpower and equipment.
 - c. In disaster situations, provide; warning, rescue assistance, evacuation assistance, security, traffic control, and information assistance.
 - d. Provide public awareness and educational programs. (911 education, safe kids program, etc.)
 - e. Have mutual aid agreements with all surrounding counties and the Utah State Highway Patrol.
- 2. Responsibility and authority in the regulating, inspecting, or funding of projects:
 - a. None
- 3. Leadership and coordination with other government agencies:

- a. Local Agencies: Within the scope of law enforcement, the Piute County Sheriff's Department coordinates with various local agencies. These agencies include Piute County Emergency Management and various local police departments.
 - b. Non-local Agencies: Piute County Sheriff's Department coordinates with appropriate state and federal agencies including; Utah Highway Patrol, Utah Attorney General's Office, Bureau of Criminal Identification, Utah Department of Transportation, and Federal Bureau of Investigation.
4. General recommendations/Emergency Management concerns:
 - a. None

E. Piute Fire District

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
 - a. Respond to fires in order to protect lives, limit injuries, and minimize damage to property and the environment.
 - b. Respond to accidents in order to provide rescue assistance.
 - c. Assist Emergency Medical Services in providing emergency assistance to sick and injured. (first responders)
 - d. Provide standard firefighting manpower and equipment.
 - e. Respond to spills and releases of hazardous materials and assist in mitigating the detrimental human and environmental effects of these occurrences.
 - f. Respond to emergencies resulting from natural occurrences such as storms, floods, etc., and assist in mitigating the detrimental results of these occurrences.
 - g. Provide training for department members that will enable them to effectively and efficiently carry out their respective duties and responsibilities.
 - h. Develop and provide educational programs that promote the prevention of fires and encourage fire-safe and fire-smart activities.
 - i. Assist in enforcement of Piute County fire ordinances.

- j. Fire investigation.
 - k. Provide assistance to other jurisdictions, as department resources and commitments allow. Piute Fire District has mutual aid agreements with Juab, Millard, Sanpete, Sevier and Wayne Counties.
 - l. Inspections and preplanning within the fire district to reduce hazards and aid in fire prevention.
 - m. Assist with the county's tier two reporting. (Hazardous materials storage sites)
 - n. In disaster situations, provide assistance in warning, rescue, evacuation, and situation updates.
2. Responsibility and authority in regulating, inspecting, or funding of projects:
- a. None
3. Leadership and coordination with other government agencies:
- a. Local Agencies: In efforts to decrease vulnerability to hazards, the Piute Fire District coordinates with various local agencies. These agencies include Piute County Emergency Management, Piute County Sheriff's Department, Circleville Fire Department, Marysville Fire Department, Junction Fire Department, local Public Works, and local Emergency Medical Services.
 - b. Non-local Agencies: Utah State Fire Marshal and the Federal Emergency Management Agency.
4. General recommendations/Emergency Management concerns:
- Our district has seen an increase in number and variety of calls. As first responders, we have to train and equip our fire departments for various situations that may arise, such as: vehicle extrication, various types of hazardous materials, and many other types of responses. Each added type of response increases the need for equipment and the time our volunteers need to spend in training. With the recent decrease in population in our district, volunteer retention and recruitment is also a concern.
- a. Seek funding outside of the district for additional equipment that will improve the effectiveness of our responses as well as increase the margin of safety for our volunteers.

- b. Explore training options to cover the expanding variety of responses in our district.
- c. Look into recruitment and retention programs that will work in our district.

F. Utah State University Extension Service *

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
 - a. The Utah State University Extension Service provides practical, research-based information and educational programs to address critical issues facing individuals, families, agricultural producers, business operators, and communities.
 - b. County Extension Agents serve as subject-matter experts, educational planners, adult and youth teachers and community facilitators in several areas including agriculture and natural resources, horticulture, family and consumer sciences, 4-H and youth community development.
 - c. Provide planning, designing, implementing, and evaluating of educational programs for livestock and forage clientele.
 - d. Areas of responsibility include beef and dairy cattle, swine, other livestock, water quality, waste management, and forages.
 - e. Provide programming for county citizens in the areas of family financial management, environmental concerns, housing, health and wellness, aging, foods and nutrition, parenting, and human development.
 - f. Serve as an information resource in dealing with drought, winter storms, summer storms etc. in relation to agriculture, environment, water resources, etc.
 - g. Assist with damage assessment related to agriculture.
2. Responsibility and authority in regulating, inspecting, or funding of projects:
 - a. Authority is at federal level.
3. Leadership and coordination with other government agencies:

- a. Local Agencies: Piute County Emergency Management and Central Utah Public Health.
- b. Non-local Agencies: Utah State University, Utah State Health Department, United States Department of Agriculture, and Farm Service Agency.

4. General recommendations/Emergency Management concerns:

- a. None.

APPENDIX II: COMMUNITY CAPABILITIES

Marysville Town Capability Assessment

Planning and Regulatory		
Plans	Yes/No	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/ Master Plan	Yes	No, no, yes
Capital Improvements Plan	Yes	No, No, Yes
Economic Development Plan	Yes	No, No, No
Local Emergency Operations Plan	Yes	Yes, Yes, yes
Continuity of operations plan	No	
Transportation plan	No	
Stormwater management plan	Yes	Yes, Yes, yes
Community wildfire protection plan	no	
Building code, permitting, and inspections	Yes/No	Are Codes Adequately enforced?
Building Code	Yes	Version/Year: IBC/2009
Land Use Planning and Ordinances	Yes/No	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
Floodplain ordinance	Yes	
Natural hazard specific ordinance (Stormwater, steep slope, wildfire)	Yes	Stormwater on own property
Flood insurance rate maps	No	
Acquisition of land for open space and public recreation uses	No	
Administrative and Technical		
Administration	Yes/No	Describe capability Is coordination effective?
Planning Commission	Yes	
Mitigation Planning Committee	No	
Maintenance programs to reduce risk (e.g. tree	Yes	Maintenance is done in Bullion Creek annually

trimming, clearing drainage systems)		
Mutual Aid Agreements	No	
Staff	Yes/No	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Yes/ PT	Yes, no, no
Floodplain Administrator	No	
Emergency Manager	Yes	County EMS
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	Yes	County GIS
Technical	Yes/No	Describe Capability has capability been used to assess/mitigate risk in the past?
Warning systems/services (reverse 911, outdoor warning signals)	Yes	Warning siren at Marysville firehouse
Hazard data and information	No	
Grant writing	Yes	Mayor writes grants
HAZUS Analysis	no	
Financial (funding resources for hazard mitigation)		
Funding resource	Access/ eligibility	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Yes	Yes/possibly
Authority to levy taxes for specific purposes	Yes	No
Fees for water, sewer, gas, or electric services	Yes	No
Impact fees for new development	Yes	No
Storm water utility fee	No	No
Incur debt through general obligation bonds and/or special tax bonds	Yes	Yes
Incur debt through private activities	No	No
Community development block grant	Yes	No
Other federal funding programs	Yes	No

State funding programs	Yes	No
Education and Outreach		
No education and outreach programs		

Junction Town Capability Assessment

Planning and Regulatory		
Plans	Yes/No	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/ Master Plan	Yes	No, no, yes
Capital Improvements Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of operations plan	No	No, No, yes
Transportation plan	Yes	
Stormwater management plan	No	
Community wildfire protection plan	No	
Building code, permitting, and inspections	Yes/No	Are codes adequately enforced?
Building Code	Yes	Follows the county's codes and uses county building inspector
Land Use Planning and Ordinances	Yes	Yes, yes
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
Floodplain ordinance	No	
Natural hazard specific ordinance (Stormwater, steep slope, wildfire)	No	
Flood insurance rate maps	No	
Acquisition of land for open space and public recreation uses	No	
How can these capabilities be expanded to improve and reduce risk?	Annexation issues need to be addressed.	
Administrative and Technical		
Administration	Yes/No	Describe capability Is coordination effective?
Planning Commission	Yes	Effective

Mitigation Planning Committee	No	
Maintenance programs to reduce risk (e.g. tree trimming, clearing drainage systems)	Yes	Town maintenance
Mutual Aid Agreements	No	
Staff	Yes/No	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	No	
Floodplain Administrator	No	
Emergency Manager	No	
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	Yes	County GIS
Comments:		
Technical	Yes/No	Describe Capability has capability been used to assess/mitigate risk in the past?
Warning systems/services (reverse 911, outdoor warning signals)	Yes	Siren on fire station, and reverse 911
Hazard data and information	No	
Grant writing	No	
HAZUS Analysis	no	
Comments: Any professional assistance would help		
Financial (funding resources for hazard mitigation)		
Funding Resource	Access/ Eligibility	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Yes	Roads improvements
Authority to levy taxes for specific purposes	Yes	Limited by state municipal code
Fees for water, sewer, gas, or electric services	Yes	For water systems
Impact fees for new development	No	
Storm water utility fee	no	
Incur debt through general obligation bonds and/or special tax bonds	Yes	CIP infrastructures

Incur debt through private activities	No	
Community development block grant	No	Not recently used
Other federal funding programs	No	
State funding programs	Yes	CIB
Education and Outreach		
No education and outreach programs: relies on county level education		

Kinston Town Capability Assessment

Planning and Regulatory		
Plans	Yes/No	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/ Master Plan	Yes	Needs updating
Capital Improvements Plan	Yes	Through Six County AOG
Economic Development Plan	Yes	Piute County Plan & Six County AOG
Local Emergency Operations Plan	Yes	
Continuity of operations plan	No	
Transportation plan	No	
Stormwater management plan	No	
Community wildfire protection plan	No	
Building code, permitting, and inspections	Yes/No	Are Codes Adequately enforced?
Building Code	Yes	
Building Code effectiveness grading schedule (BCEGS) Score	Yes	
Fire department ISO rating	Yes	
Land Use Planning and Ordinances	Yes/No	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
Floodplain ordinance	No	
Natural hazard specific ordinance (Stormwater, steep slope, wildfire)	No	

Flood insurance rate maps	No	
Acquisition of land for open space and public recreation uses	No	
Administrative and Technical		
Administration	Yes/No	Describe capability Is coordination effective?
Planning Commission	Yes	
Mitigation Planning Committee	No	
Maintenance programs to reduce risk (e.g. tree trimming, clearing drainage systems)	No	
Mutual Aid Agreements	No	
Staff	Yes/No	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Yes	County
Floodplain Administrator	No	
Emergency Manager	Yes	Yes, Mike Gaylor County
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	No	
Technical	Yes/No	Describe Capability has capability been used to assess/mitigate risk in the past?
Warning systems/services (reverse 911, outdoor warning signals)	Yes	Fire Station
Hazard data and information	No	
Grant writing	No	
HAZUS Analysis	no	
Financial (funding resources for hazard mitigation)		
Funding resource	Access/ eligibility	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	

Impact fees for new development	Yes	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community development block grant	Yes	
Other federal funding programs	Yes	
State funding programs	Yes	
Education and Outreach		
Town operates an Ongoing Public Education Program		

Circleville Town Capability Assessment

Planning and Regulatory		
Plans	Yes/No	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/ Master Plan	No	
Capital Improvements Plan	Yes	
Economic Development Plan	No	
Local Emergency Operations Plan	Yes	County
Continuity of operations plan	No	
Transportation plan	No	
Stormwater management plan	Yes	
Community wildfire protection plan	No	
Building code, permitting, and inspections	Yes/No	Are Codes Adequately enforced?
Building Code	Yes	Piute County
Building Code effectiveness grading schedule (BCEGS) Score	No	
Fire department ISO rating	Yes	
Land Use Planning and Ordinances	Yes/No	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?

Zoning ordinance	Yes	Yes
Subdivision ordinance	Yes	
Floodplain ordinance	No	
Natural hazard specific ordinance (Stormwater, steep slope, wildfire)	No	
Flood insurance rate maps	No	
Acquisition of land for open space and public recreation uses	No	
Administrative and Technical		
Administration	Yes/No	Describe capability Is coordination effective?
Planning Commission	No	
Mitigation Planning Committee	No	
Maintenance programs to reduce risk (e.g. tree trimming, clearing drainage systems)	Yes	Town maintenance
Mutual Aid Agreements	No	
Staff	Yes/No	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Yes	Yes, county
Floodplain Administrator	No	
Emergency Manager	No	
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	No	
Technical	Yes/No	Describe Capability has capability been used to assess/mitigate risk in the past?
Warning systems/services (reverse 911, outdoor warning signals)	Yes	Firehouse outside siren to give warning signal
Hazard data and information	No	
Grant writing	No	
HAZUS Analysis	No	
Financial (funding resources for hazard mitigation)		
Funding resource	Access/ eligibility	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?

Capital improvements project funding	Yes	Water dredging in Sevier River bottom, specifically north side
Authority to levy taxes for specific purposes	Yes	No
Fees for water, sewer, gas, or electric services	Yes	No- could be used in the future
Impact fees for new development	Yes	Yes- impact fee for future development
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	
Incur debt through private activities	No	
Community development block grant	No	
Other federal funding programs	No	
State funding programs	Yes	CIB funds- road improvements
Education and Outreach		
Program/Organization	Yes/No	
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No	

APPENDIX III: OTHER AGENCY RESOURCES

A. Mitigation and risk reduction:

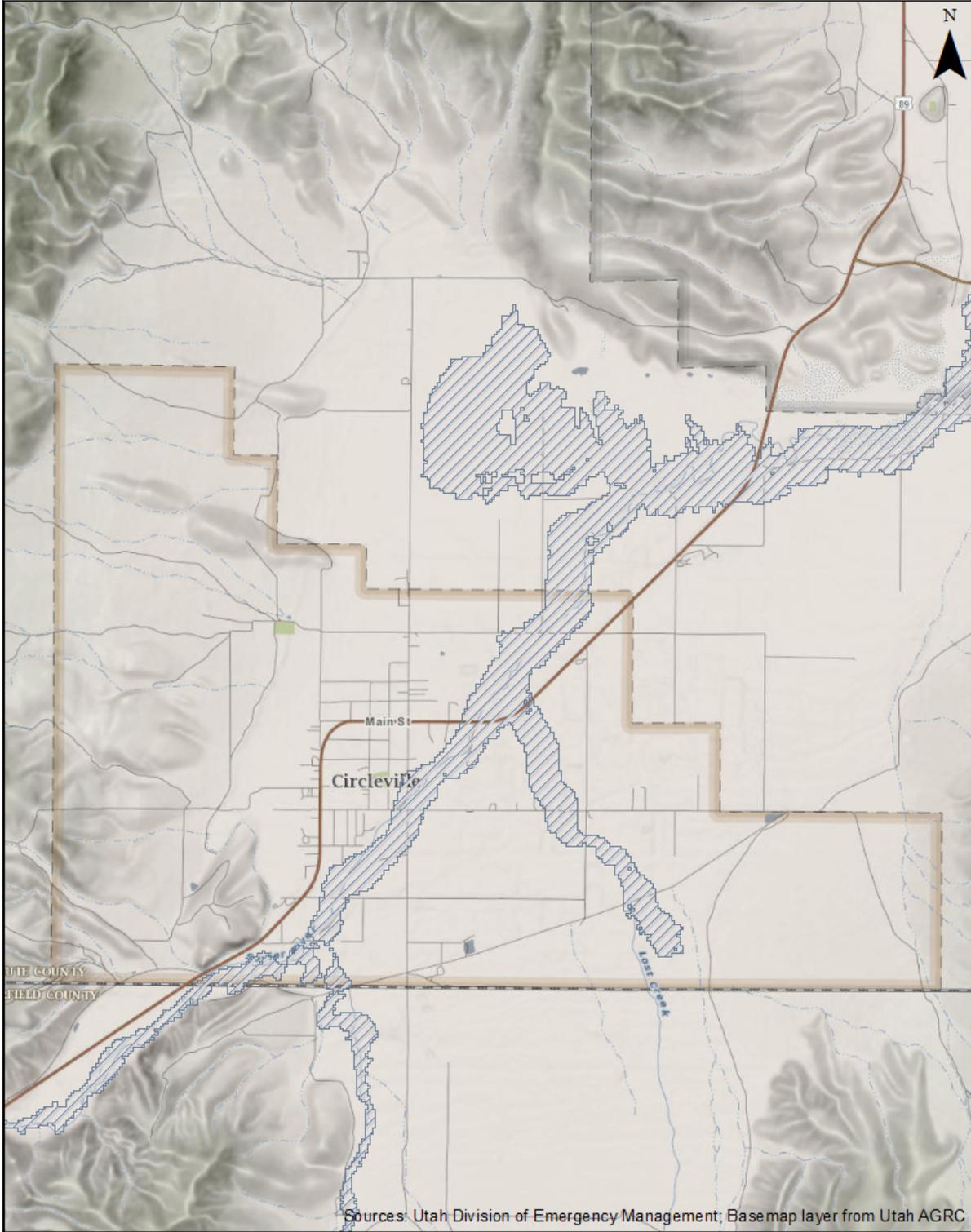
1. Piute County Social Services: Temporary assistance to needy families, food stamps, medically needy programs, adult services, homeless assistance, family planning, etc.
2. Army Corps of Engineers: Water and dam management within the county. Provide technical expertise, sandbags, and heavy equipment.
3. Utah Highway Patrol: Situation and damage assessment; provide transportation resources for movement of state personnel, supplies, and equipment to include air and ground reconnaissance; traffic control.
4. State Fire Marshal: Hazmat route utilization; HAZMAT technical assistance; situation and damage assessment.
5. Forestry, Fire & State Lands: Debris removal from recreational facilities; technical assistance; situation and damage assessment.
6. Utah Division of Wildlife Resources: Technical assistance; debris removal from recreational facilities; facility improvements; situation and damage assessment.
7. State Radio Communications: Exercise readiness of warning systems and communication support.
8. Department of Agriculture: Assists with situation and damage assessment; coordination with USDA; HAZMAT technical assistance; state land use program.
9. Department of Workforce Services: Situation assessment and administration of disaster unemployment assistance programs.
10. Human Services: Insure liaison with private relief agencies for disaster victims.
11. State Historical Society: Project screening and situation assessment.

APPENDIX IV: 100-YEAR FLOODPLAIN MAPS

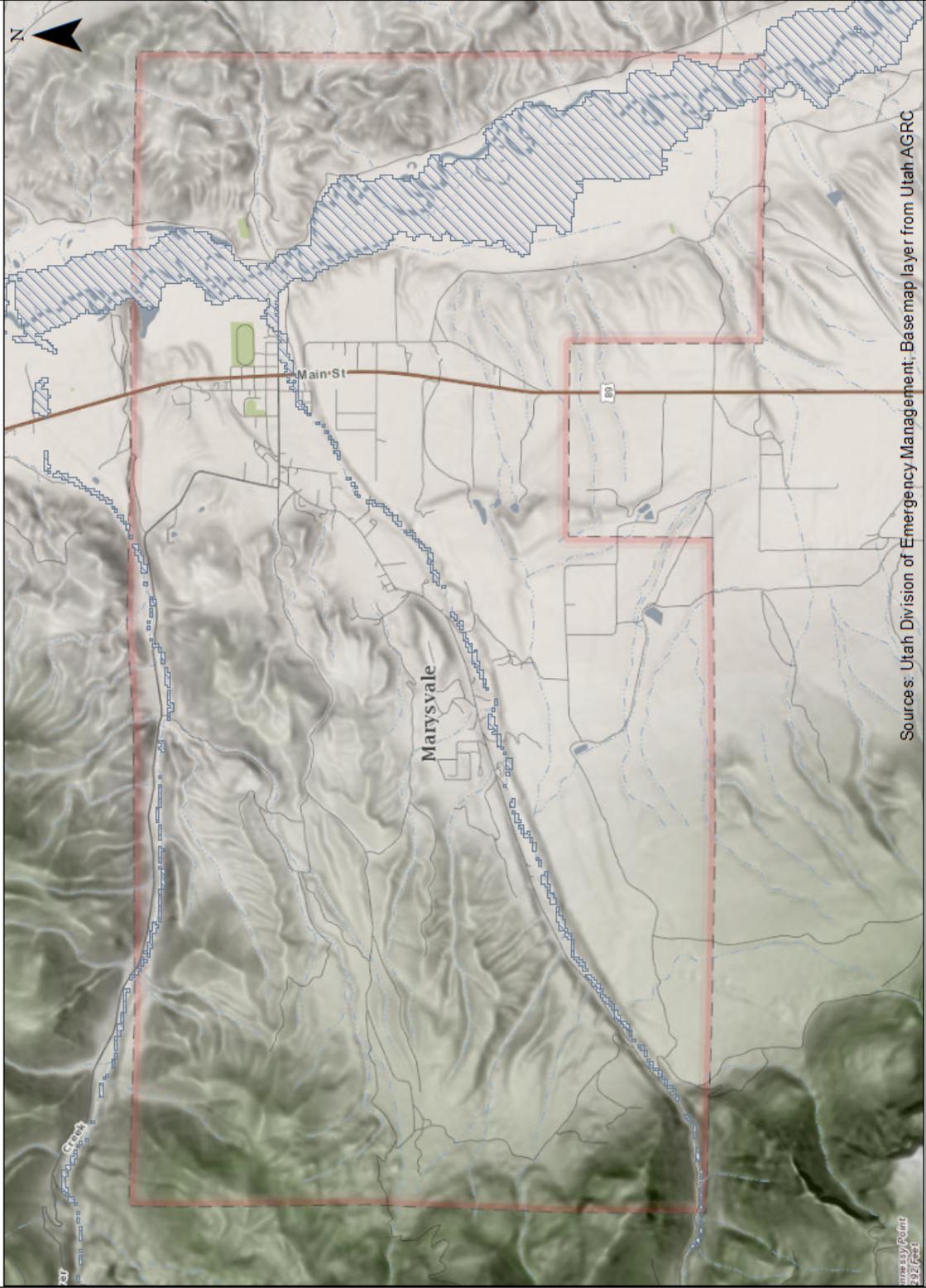
Junction & Kingston: 100-Year Flood Plain



Circleville: 100-Year Flood Plain

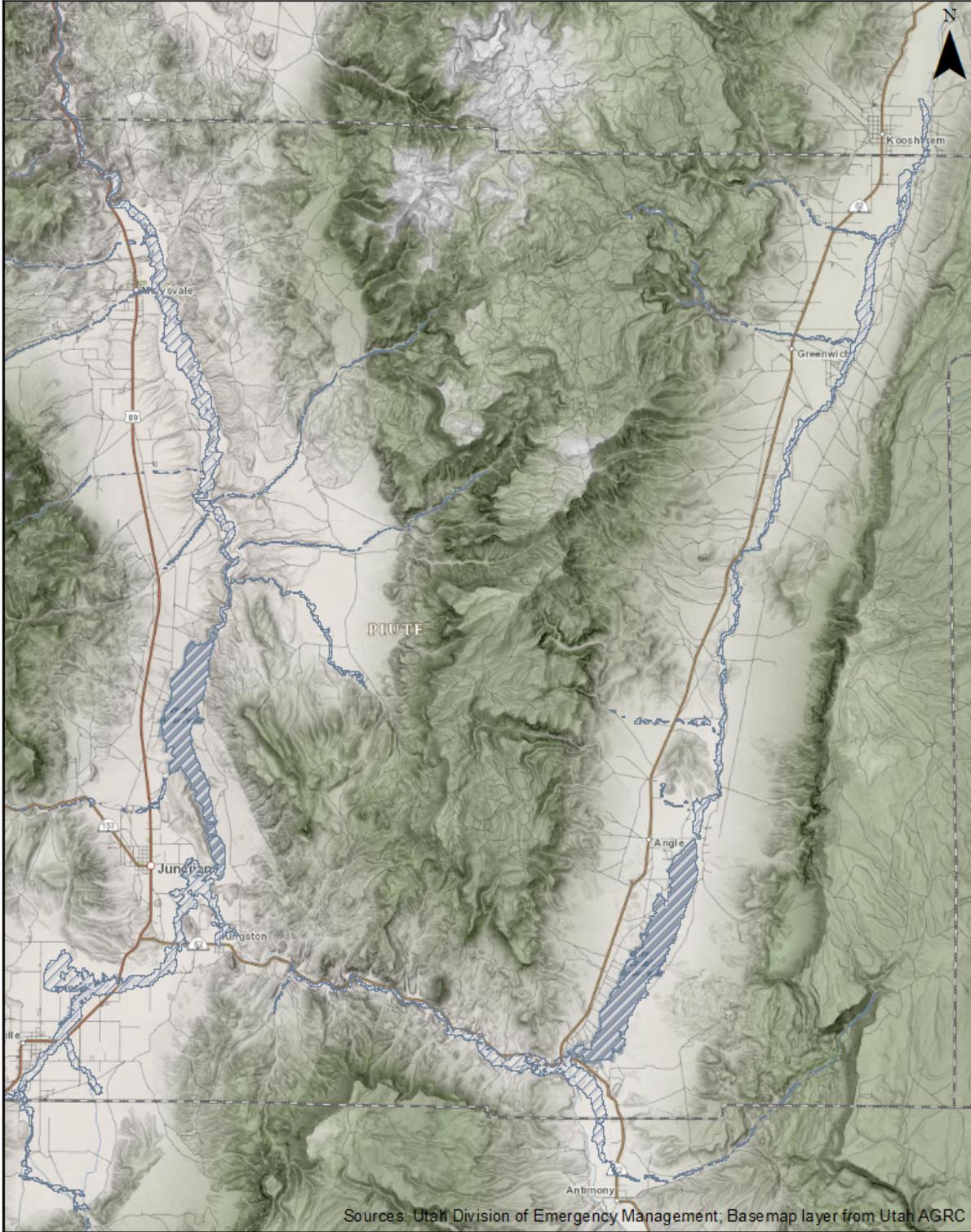


Marysvale: 100-Year Flood Plain



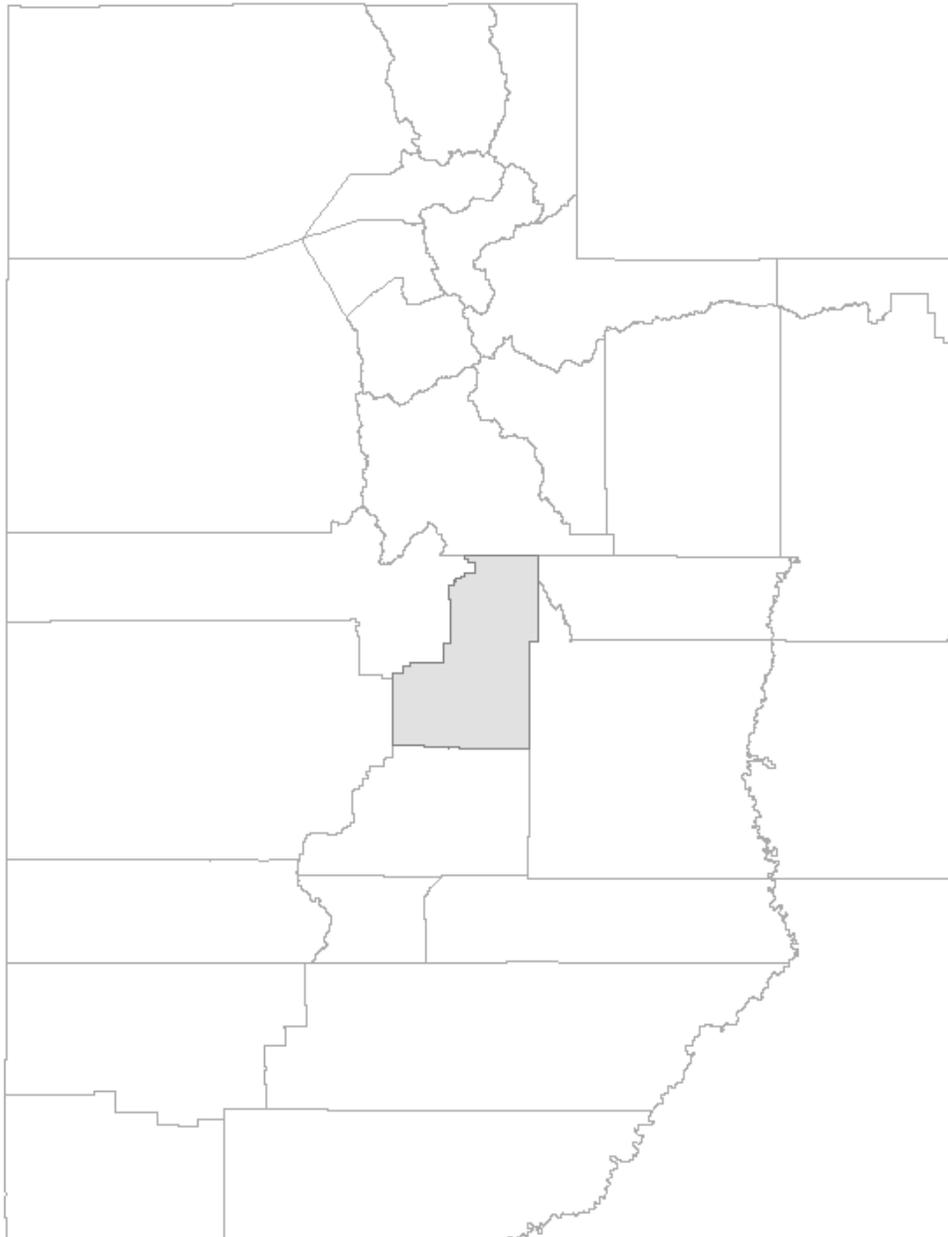
Sources: Utah Division of Emergency Management; Base map layer from Utah AGRC

Piute County: 100-Year Flood Plain



Sanpete County

Natural Hazard Assessment for Pre-Disaster Mitigation



Prepared by: Chelsea Bakaitis, Six County AOG Planning

Contents

Introduction.....	1
Background Information.....	1
Capability Assessment.....	2
Sanpete County Capabilities.....	2
Centerfield City.....	2
Moroni City.....	2
Critical Facilities.....	3
Sanpete County Flooding.....	3
History of Flooding in Sanpete County.....	4
Flood Assessment for Sanpete County.....	6
Location and Extent.....	6
Assessing Vulnerability: Addressing Repetitive Loss Properties.....	9
Sanpete County Wildfires.....	10
History of Wildfires in Sanpete County.....	10
Wildfire Assessment for Sanpete County.....	10
Location and Extent.....	11
Sanpete County Landslides.....	12
Landslide History.....	12
Landslide Assessment for Sanpete County.....	13
Sanpete County Earthquakes.....	16
History of Earthquakes in Sanpete County.....	16
Earthquake Assessment for Sanpete County.....	16
Location and Extent.....	16
Sanpete County Dam Failure.....	18
History of Dam Failure in Sanpete County.....	18
Dam Failure Assessment for Sanpete County.....	18
Description of location and extent.....	19
APPENDIX I: CAPABILITIES OF COUNTY AGENCIES.....	i
A. Sanpete County Emergency Management.....	i
B. Sanpete County Road Operations *.....	iii
C. Central Utah Public Health.....	iv
D. Sanpete County Sheriff’s Office.....	v
E. Sanpete Fire District.....	vi
F. Utah State University Extension Service *.....	viii
APPENDIX II: MITIGATION CAPABILITIES OF COMMUNITIES.....	x
Centerfield Capability Assessment.....	x
Moroni Capability Assessment.....	xiii
APPENDIX III: OTHER AGENCY RESOURCES.....	xvi
APPENDIX IV: LANDSLIDE MAPS.....	xvii

Introduction

This document is an overview natural hazard in Sanpete County. It tells about the history of hazards in the county and defines present and future projected risks. It serves as an annex of the general SCAOG Regional Pre-Disaster Mitigation Plan and is divided into sections covering the following hazard topics: earthquakes, floods, landslides, wildfires, and dam failure. Each section contains information about the history of the hazard, and an assessment of the extent and location of the hazard. Sanpete County Emergency Manager, Jayson Albee, assisted with gathering information for this plan, as well as coordinating contact with the communities. All municipalities were asked for information about hazards in their area.

Background Information

Approximately 42% of the total land area in Sanpete County is privately held and outside the incorporated areas is almost entirely vacant. The other 58% is owned by the state or federal governments and aside from extractive industry is beyond the reach of development.

The vast majority of landslides, debris flows and wildfires occur on these public lands with virtually no impact on development. Of the privately held land, most is not developable due to a lack of water and county zoning requirements of water access and a minimum of five acres per house. Other limitations include steepness of the terrain, flash flood plains and accessibility.

There is still plenty of infill within city limits that can be utilized for safe development without developing in unincorporated, sparsely populated, or hazardous areas.

Sanpete County requires UBC on all new or proposed buildings. New subdivisions require a grading and drainage plan to mitigate any flooding, which may occur. Since most of the privately held land is along US 89 corridor, development is occurring in the communities and unincorporated land close to this road. This corridor is where future development is likely to happen. Except for lands adjacent to the San Pitch and Sevier Rivers, this corridor is relatively safe from natural hazards.

Figure 5-1: Participating Sanpete County Jurisdictions

- Centerfield
- Ephraim
- Fairview
- Fayette
- Fountain Green
- Gunnison
- Manti
- Mayfield
- Moroni
- Mount Pleasant
- Spring City
- Sterling
- Wales

Capability Assessment

A capability assessment looks at “safeguards” that jurisdictions have in place to prevent or mitigate disasters. These measures include: planning and regulatory policies, administrative and technical roles, tax and funding resources, and educational/outreach programs. For more specifics about capabilities please see Appendices II and III for county and community capabilities.

Sanpete County Capabilities

Sanpete County has several different agencies which support mitigation actions. The Emergency Management of the county helps coordinate mitigation and risk reduction. This group also works with Six County AOG in the making of the mitigation plan. The County Highway Department also works to mitigate risk by making sure roadways are properly maintained with proper equipment to prevent flooding and overflow. Central Utah Public Health acts as a state agency but assists with preventing health hazards in the case of a disaster. The County Sheriff’s Department is responsible for law enforcement in unincorporated areas and smaller towns without departments. It works with the County Fire District in being a response to emergencies. Educational outreach is provided by the Utah State University Extension Service. It provides agricultural and environmental information in dealing with drought and winter storms. It coordinates with County Emergency Management and Public Health. A more detailed list of agencies and their roles can be found in Appendix I.

Centerfield City

Centerfield City relies on the county for emergency service response and planning due to wildfire. They also rely on the county building inspector. The community does have its own planning and zoning committee, which enforces development standards. The Gunnison Valley Fire Department provides emergency services as well, and provides disaster training.

Moroni City

Moroni City is working on a local emergency operations plan. It is under review but will be completed in a few months. They also have two hazard related ordinances in their building code. They have zoning ordinances, subdivision, and a floodplain ordinance. All administrative and technical operations are handled by the city council or a member of the council. The city contracts out for civil engineer and GIS services, as do many communities in Sanpete County. The community also has a siren/warning system in the case of potential disaster. This is coordinated with the county. Financially the city is able to draw from levying taxes for specific purposes, also there are fees for utility services. There are also impact fees for new development, but they are not enforced. The city also has gotten funding from CDBG and CIB. Moroni City has no emergency management community education.

No capability information was received from the listed municipalities:

- Ephraim
- Fairview
- Fayette
- Fountain Green
- Gunnison
- Mayfield
- Mount Pleasant
- Spring City
- Sterling
- Wales
- Manti

Critical Facilities

Critical facilities are given special consideration when planning mitigation projects: They are the activities and facilities that even a slight chance of a hazard is a great threat. Critical facilities include hospitals, fire stations, police stations, critical records, water treatment, and other similar facilities. Sanpete County and each of its municipalities were asked to list their critical facilities and define what natural hazards pose the greatest risk to each facility. The following charts outline information given by the municipalities of their critical facilities and what natural hazards posed the greatest threat to these facilities.

Table 5-2: Sanpete County Critical Facilities		
Critical Facilities	Greatest Risk	History of Damage
Centerfield City Critical Facilities		
Water tank east of Centerfield	Earthquake, slide, flood, fire	1983 flood took out water main in Mayfield
Water treatment facility of Mayfield	Earthquake, slide, flood, fire	
Centerfield Church (LDS)	Earthquake, fire	
Walker's/Miller's gas station	Earthquake	
Moroni City Critical Facilities		
Fire Station City Hall and Ambulance Station/Police Station Wastewater Treatment Plan (WWTP) Well houses and head houses	Earthquake, storms	none

No Critical Facility information was received from:

- Ephraim
- Fairview
- Fayette
- Fountain Green
- Gunnison
- Manti
- Mayfield
- Mount Pleasant
- Spring City
- Sterling
- Wales

Sanpete County Flooding

The 2003 Hazard Mitigation plan placed Sanpete County as having a low threat from flooding. But due to the frequency of expensive floods, including presidential declaration floods this report considers flooding to be a medium threat.



History of Flooding in Sanpete County

Three years in a row ('82, '83, '84) Sanpete County experienced severe flooding. They were all were Presidential disaster declarations.

Several communities were affected, especially those along Highway 89. In the assessment, most communities pointed to 1983 as the worst year out of the three. Gunnison, Fayette, and Manti got the brunt of heavy water runoff. Several roads and bridges were also closed from the flooding, which amounted to \$650,000 in damage. A water main in Mayfield was taken out which affected several other community water sources, including Centerfield City. Ephraim City also lost water after each flood each year. The floods of 1983 and 1984 were especially devastating for Sanpete County residents. Total economic loss to cities and the county exceeded \$1 million in 1983 and nearly \$500,000 in 1984. Floodwaters from these events destroyed many bridges, culverts, water lines, and sewer lines with in Sanpete County.

Since these floods, there has been one other Presidential Declaration of Disaster in 2011. Although flooding is not an annual occurrence that affects people, when it does happen there is always expensive damage, as can be seen from the table of Sanpete County Flood History.

According to the SHEL DUS database, between 1980 and 2012 there has been a total property loss of \$7,489,103, and a crop loss of \$6,228,653. This is a total loss in these 32 years of being \$13,717,756. Sanpete County is ranked ninth out of 29 counties in terms of total monetary loss based on past flood events.

Date	Location	Critical Facility or Area Impacted	Comments
July 24, 1946	Mount Pleasant	Devastated city damaging homes, businesses, railroad tracks, water lines, livestock, and streets	\$500,000 in damage. Flood originated from Mount Pleasant Canyon.
August 7, 1952	Mount Pleasant	Irrigation systems and farmlands	\$10,000 dollars in damage. Flooding from Birch Creek and North Creek

July 30, 1956	Manti	Farms, irrigation canals, and roads.	Willow Creek
August 5, 1961	Fountain Green	Farmlands, crops, and fish hatchery.	\$31,000 in damage. Flood from Tidds and Log Canyons
July 17-19, 1965	Ephraim	Damage to roads, canals, and a flood control dam.	Willow Creek
July 31, 1965	Mount Pleasant/Wales/Spring City	Roads and culinary water system	\$10,000 in damage. Pleasant Creek and Twin Creek.
1982, '83, '84	Ephraim	Water line	
1983	Centerfield, Ephraim, Fairview, Fountain Green, Gunnison, Manti, Mayfield, Moroni, Mount Pleasant, Sterling, and Spring City.	All sectors impacted by event loss to road, culverts, agriculture, sewer, infrastructure, flood controls, etc.	Presidential: Source Twelve-mile, Cottonwood, Creeks, Pole Gamit, and Log Canyons, Peacock springs, San Pitch River. Public road damage amounted to \$650,000. Waterline for Mayfield, Centerfield, and Ephraim.
1984	County wide	All sectors impacted by event loss to road, culverts, agriculture, sewer, infrastructure, flood controls, etc.	Presidential: Public assistance totals \$1,382,136.
July 22, 1998	Spring City	Damage to road, bridges, water supply, diversion structures, and 12 homes.	Flash Floods: \$2.5 million est. damage from Canal and Oak Creeks.
2002-2003	Clarion, Lone Cedar Road	Damage to structures and road.	Two years in a row.
April 18-July 16, 2011	County Wide		Presidential Disaster Declaration. Record breaking snowpack, heavy spring rains and arm summer temperatures led to flooding. \$12.46 per capita impact
July 2012	Fountain Green	Debris flow on S.R. 132, road closure	Flash flood, debris flow from burn scar of Wood

			Hollow fie. Damage to multiple homes, and acreage of farm land
2014	Wales Washed Out Road		NEED MORE INFO
Sources: <i>Flood Hazard Identification Study Six County AOG</i> , 2003, USACE, Utah Division of Emergency Services; Information from Hazard Assessment meetings with Communities and Sanpete County Sherriff's office; Sanpete historical society			

Flood Assessment for Sanpete County

Table 5-4: Hazard Profile for Flooding in Sanpete County

Severity	Limited
Location	Flooding would occur in and along flood plains.
Seasonal Pattern	Sanpete County's main flooding threat is from flash floods from heavy monsoonal rains.
Duration	The type of event determines the duration of flooding; flooding due to summer thunderstorms can last a couple of hours whereas flooding due to spring runoff can last weeks.
Speed of Onset	Six to twelve hours.
Probability of Future Occurrences*	Likely: 10 to 9 percent probability of occurrence in the next year or recurrence interval of 1 to 10 years.
Source: Based on assessments created by jurisdictions.	

Location and Extent

As a whole, Sanpete County has limited flood threat, although this hazard does affect residences and agriculture every few years. Table 5-5 lists what communities participate in the National Flood Insurance Program (NFIP), and Table 5-6 lists which do not participate.

Table 5-5: NFIP Sanpete municipalities participants

Community Name	Current Effective Map Date	Date of Entry
EPHRAIM, CITY OF	05/02/2012(M)	04/03/1987
FAIRVIEW, CITY OF	05/02/2012(M)	02/01/1987
FOUNTAIN GREEN, CITY OF	05/02/2012(M)	01/17/2013
GUNNISON, CITY OF	05/02/2012(M)	01/30/1984
MANTI, CITY OF	05/02/2012(M)	08/04/1987
MAYFIELD, TOWN OF	05/02/2012(M)	05/02/2012
MORONI, CITY OF	05/02/2012(M)	08/05/1980
MOUNT PLEASANT, CITY OF	05/02/2012(M)	09/24/1984
SANPETE COUNTY (unincorp)	05/02/2012(M)	06/01/1986
SPRING CITY, CITY OF	05/02/2012(M)	08/05/1980

Table 5-6: Non NFIP participating Sanpete municipalities		
Community Name	Current Effective Map Date	Sanction Date
STERLING, TOWN OF	05/02/2012	05/02/2013
WALES, TOWN OF	05/02/2012	05/02/2013
CENTERFIELD	No Special Flood Zone	
FAYETTE	No Special Flood Zone	

In 2013 Utah Division of Emergency Management ran a HAZUS 100-year flood scenario for each county. The model estimated that in the case of an extreme 100-year flood (1% chance of occurrence every year) there would be 32 buildings damaged. This would mean a building damage loss of \$7,262. Building exposure would be \$1,100,241, and the contents damage loss would amount to \$13,455. There would be a total contents exposure loss of \$793,185. Overall there would be a \$0.77 per capita loss. The county was ranked as 9th out of the state in the number of buildings that would be damaged out of the 29 counties assessed. This puts Sanpete County at a Medium Flood Loss estimate according to the state HAZUS vulnerability assessment. Overall, Sanpete County ranks 10th out of the 29 counties in the state for flood vulnerability. This measure of vulnerability looks at the extent of flooding and the development and infrastructure at risk from flooding.

The population of Sanpete County is primarily located within the Sanpete Valley, which is boarded on the east by the Wasatch Plateau and to the west by the San Pitch Mountains. Thus the Sanpete Valley is topographically low heightening residents risk to spring snowmelt flooding, coming from high mountain snow pack. Streams running through population centers and alluvial fan development are common in Sanpete County.

Watersheds at risk from flooding caused by fire include: Manti Creek, Ephraim Creek, Pine Creek, Twin Creek, Pleasant Creek, Cottonwood Creek, San Pitch River, Log Canyon Creek, Uinta Creek, Gemmet Creek, Oak Creek, Canal Creek, Six Mile Creek, Wales Canyon Creek, and 12 Mile Creek (CWPP, 2007). Incorporated areas within Sanpete County and the streams, which cause flooding problems, are listed below.

Gunnison has moderate to major flood threat from the San Pitch River.

Spring City has a flood risk from Canal Creek. This Creek floods regularly and in 1998 there was extensive damage. There is also a minor threat from Oak Creek. Historic Spring City has faced floods since its earliest times, but the “old timers” describe floods of their memories back to 1934, when a severe snowmelt flood inundated Spring City for about two weeks. Another snowmelt flood struck the city in 1952 and again in 1983. A flash flood in 1998 at Canal Creek destroyed a county bridge and resulted in about \$2.5million in city-wide

damages. Numerous landslides formed above both Canal Creek and Oak Creek in 1983 and continue to threaten Spring City.

Mayfield experiences minor flooding from Twelve Mile Creek. In the 1983 flooding the Mayfield water main was damaged, and this critical facility is still at a flood risk. Landslides or logjams could aggravate the flood threat.

Unincorporated Sanpete County has the greatest threat of flooding adjacent to the Sevier and San Pitch Rivers (and their tributaries). There is a 100-year flood risk in this area. For greater detail please see the FIRM for this area, located in APPENDIX of this document.

Centerfield is identified by FEMA FIS 2012 study as a No Special Flood Hazard Area (NSFHA). This is because there are no rivers or creeks in the area, although local runoff could be a problem. Even so, city officials consider a flood as likely affecting them. This means that it is estimated that there is a 10 to 90 percent probability of occurrence in the next year or a recurrence interval of every 1 to 10 years. The 1983 flood affected the city when the water main in Mayfield was damaged. Flooding is common about every 25 years, and the major impact to the city is to the water system—based on precedence.

The **Moroni** is threatened by the San Pitch River on the south area of town. Flooding would cause low damage to development, and is infrequent. City officials rated that the probability of a flood happening in the city is unlikely.

Also considered an NSFHA is the town of **Fayette**. Even so, it has a minor flood threat, from the eastside drainages. There is also a minimal threat from the Fayette Canal and Sevier Bridge Reservoir. The Warm Creek Wash is also a minor threat. The Fayette Creek runs through the middle of town, but is usually dry and acts as a small watershed. Flood threat is low.

Flooding is a major threat for **Fountain Green** on the west and to a lesser extent from the north from Log Canyon Creek, Uinta Creek, and Gemmett Creek.

Fairview is at risk of moderate flooding from Cottonwood creek, and minor flooding from the San Pitch River.

Sterling has a low threat of flooding in developed property. There is a risk for incidental flooding from Palisade reservoir and Six Mile Creek, on the north side of town.

There is also a limited flood threat on the south end of **Wales Town** coming from Wales Canyon Creek.

Canal Creek poses a threat for the residential areas of **Ephraim, Spring City, Mt. Pleasant, and Manti**. This area flooded in 1998, and is at a risk to flood again.

Ephraim is also affected by Ephraim Creek, which floods occasionally.

Pine Creek/Twin Creeks floods **Mt. Pleasant** often. There is also occasional flooding from Pleasant Creek.

Manti City has the most severe risk of flooding out of developed land in the county according to the most recent conducted FIS. It is on the eastern edge of the Sanpete Valley, surrounded by unincorporated areas of Sanpete County. The city sits at the mouth of Manti canyon, where flooding sources originate from Manti creek and the north and south branches of Manti creek (city creek and south creek, respectively). Development in and near floodplains is largely residential with some commercial development along Main Street. The city is subject to flooding beginning in Manti Creek through South Creek from heavy snowmelt and severe summer storms. In the south area of the town, overbank flooding is extensive because of low banks and land adjacent to stream. Areas prone to flooding are also at the mouth Manti Canyon. There are also two large boulder dams upstream of the city within the canyon. More information about these dam risks will be discussed later in the document. More detail about Manti City Flood risk can be found in the FEMA Flood Insurance Study 2012.

Assessing Vulnerability: Addressing Repetitive Loss Properties

There are no repetitive loss properties in Sanpete County (FEMA, 2014).

Sanpete County Wildfires

Wildfire hazards is a major focus for the county, it has the highest wildfire risk out of the Six County region. The county and state has put funding into efforts of planning and mitigation for WUI. The main county jurisdictions run along Highway 89, and so are surrounded by wilderness area (Manti-La Sal National Forest and Fishlake) towards the east and west. These undeveloped areas are vulnerable to wildfire.

History of Wildfires in Sanpete County

The most extensive wildfire damage in Sanpete County has been caused by flooding as an after effect of a burn scar. Economic damage due to flooding after a fire occurred in 1983, 1984, 1998, and 2012. Recent wildfire history in Sanpete has proven that wildfires are a destructive hazard risk. The Wood Hollow wildfire of 2012 impacted 39,000 acres and was the cause of one death. Over 100 structures were destroyed from this fire. Two years later Ephraim had one houses and two damaged from wildfire.

Overall the majority of wildfires that have happened are located in the WUI area along Highway 89, and along Highway 28 just southeast of Yuba Reservoir. The map on the following page demonstrates wildfires from 1973 to 2005 and their intensity.

Date	Location	Critical Facility or Area Impacted	Comments
June 24, 2012	Fountain Green, Fairview, Indianola	39,000 acres, 1 death	550 residents evacuated. 52 homes and over 100 structures destroyed. Minor Flooding associated with burn scar. Wildfire- Wood Hollow Fire
July 25, 2014	Ephraim		One house destroyed, two houses damaged

SOURCE: Sanpete Messenger

Wildfire Assessment for Sanpete County

Frequency	Annual (not always in developed areas)
Severity	High in the Urban-Wildland Interface. Does not affect development annually
Location	Entire county except cultivated grounds.
Seasonal Pattern	Most wildfires affecting Sanpete County occur during mid to late summer months (fire season).
Duration	The amount of time needed to contain a wildfire depends on a variety of uncontrollable variables such as: wind speed, relative humidity, type, and moisture content of fuel, weather, and topography. Thus containment

	time varies for each fire.
Speed of Onset	0 to 6 hours is the minimum amount of time given to homeowners in order to evacuate.
Probability of Future Occurrences in Developed Areas	Likely: 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years.

Location and Extent

The State has identified 32 communities identified by the state as being at risk from wildfire: Aspen Hills, Beaver Dams, Canal Canyon, Elk Ridge, Ephraim, Fairview, Fairview Lakes, Ferron Reservoir, the Great Basin Environmental Education Center (GBEEC), Gooseberry Mountain Estates, Hideaway Valley, Indian Ridge, Indianola, Manti, Manti Summer Homes, Mayfield, Mia Shalom, Milburn, Mount Pleasant, Oaker Hills, Palisade/Six Mile, Panorama Woods, Pine Creek, Pine Mountain, Sky Haven, Skyline Mountain Resort, Spring City, Sterling, Tucker, Utibica, Whispering Pines, and Willow Glen.

Sanpete County is ranked by the Utah Division of Emergency Management as 21 out of the 24 assessed counties. Even so, wildfire hazards is a concern for the county.

A list of Regional Recommendations and Priorities may be found in the Central Utah Regional Wildfire Protection Plan (CWPP), May 4, 2007. The Utah Division of Forestry, Fire, and State Lands is also putting together forthcoming a wildfire assessment for the Six County Region. More information can also be found in the Utah Division of Emergency Management Emergency State Hazard Mitigation Plan 2014 update.

According to the 2014 State Hazard Assessment Update, Sanpete County has a total of 303.4 square miles in extreme risk area and 555 square miles in high hazard area. Total there are 8584 square miles in this extreme and high risk area. There is estimated to be 301 structures in this area. Replacement costs of residential units and annual sales of commercial units would be \$24,429,359 (inflation adjusted). This translates to a per capita loss of \$875.77.

Watersheds at risk from flooding caused by fire include: Manti Creek, Ephraim Creek, Pine Creek, Twin Creek, Pleasant Creek, Cottonwood Creek, San Pitch River, Log Canyon Creek, Uinta Creek, Gemmet Creek, Oak Creek, Canal Creek, Six Mile Creek, Wales Canyon Creek, and Twelve-Mile Creek (CWPP, 2007).

Based on Six County Mapping assessment, there is infrastructure in areas of high to extreme wildfire risk. There is about 1,210 miles of local streets and road in risk zones, two miles of state highway and 17 miles of US highway. Critical facilities at risk include three electrical substations and over 50 miles of power line.

Sanpete County Landslides

Landslide History

In late May and early June of 1983, a rapid and sustained snowmelt triggered hundreds of landslides in the mountainous regions of Sanpete County. As discussed in the section on flooding this snowmelt caused a Presidential Disaster Declaration level of flooding.

Landslides are an occasional occurrence in Sanpete County. Historically Manti, Ephraim, Mount Pleasant, and Fairview have been affect by landslide events. Landslide events have also indirectly affected these areas by setting off debris flow and overflowing creeks and reservoirs. In 2011 a landslide events washed out some roads and affected Manti and Fairview Water treatment. For more details on landslide events please consult the below tables.

Landslide maps are also available in APPENDIX IV. They demonstrate landslide patterns and the geological morphology of the county.

Date	Location	Critical Facility or Area Impacted	Comments
1977	Manti	Water	From Manti Canyon
1983-1984	Ephraim	Water	
2011, August	Wasatch Plateau east of Ephraim	Ephraim Water, Fairview water culverts	
2012	San Pitch Mtns (200 South/West Side Road)	Highway 117: road between Wales and Fountain Green	

Source: Sanpete Messenger, Hazard Assessment correspondence with communities

Event Year	Location	Notes
1889	Ephraim Creek	Mud from the debris flow was up to three feet deep.
1889	Ephraim Creek	Mud from the debris flow was up to three feet deep.
1893	from Fairview to Spring City	The debris flow left one to three feet of mud and debris on the streets after overflowing the banks of Pleasant Creek.
1893	Fairview, Spring City, and Mount Pleasant	The debris flow left one to three feet of mud and debris on the streets after overflowing the banks of Pleasant Creek.
1893	east of Manti	The landslide exposed a "hot air cave."
1896	Mt. Pleasant	The debris flow ran down Pleasant Creek.

1901	Cottonwood Creek near Fairview	
1901	Cottonwood Creek near Fairview	The possible debris flow destroyed the road in the canyon.
1901	Manti Canyon	
1903	Pleasant Creek near Mount Pleasant	Approximately three surges occurred in the debris flow. The last surge was "so thick with mud it could hardly move."
1912	possibly Manti	The landslide occurred on a power ditch. The article states that this site "has given trouble several times."
1918	Mt. Pleasant	Three streets were covered with mud and debris. Several buildings suffered damage. Cost of damages also includes flood damages.
1918	Mt. Pleasant	Damages were reported to be about the same as the previous flood that occurred on June 19th. Cost of damages also includes flood damages
1918	Mt. Pleasant	The mud was three to four feet deep in some places. This is a report of damages from "recent floods." The debris flow could be the result of either the June 19th or the July 9th storms, or a combination of both.
1955	Manti	Three feet of mud and rocks deposited by the debris flow closed the Manti Canyon road.
1955	Manti	The irrigation canals along the base of the hills were filled with silt.
1955	Mount Pleasant	The mud flowed as thick as concrete in some areas.
1955	Mount Pleasant	The debris flow occurred in North Creek and is described as a thick mud-rock flow.

Landslide Assessment for Sanpete County

Table 5-11: Hazard Profile for Landslides in Sanpete County

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Frequency	Somewhat Common
Severity	Moderate
Location	Mass wasting in Sanpete County is located predominately along the Canyon's east of the Sanpete Valley and in the mountains and foothills between Fairview and Fountain Green (see map 3.1 on p.32 of this Annex; No data available south of Spring City in Sanpete County).
Seasonal Pattern	Landslides most often occur within Sanpete County during spring months with higher than normal amounts of precipitation.
Duration	Several months
Speed of Onset	No warning
Probability of Future Occurrence	Likely: 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years.

According to the State 2014 Hazard Assessment Update, about 783.6 square miles of the county is within high or moderate landslide susceptibility areas. This means that overall Sanpete County ranks 14 out of the 29 assessed counties in Utah for landslide risk. The following map demonstrates where the very low to high landslide risks are. Most of the risk is in undeveloped areas.

SR 31 is at risk of landslides for a 4.8 mile stretch, while **SR 132** is at a risk for only 0.2 miles. About 153 miles of local roads are at risk. These are roads that overlay historically active landslides. Electrical infrastructure at risk include KV-46 Line (3.8 miles) and KV-138 (0.3 miles) and KV-345 (1.5 miles).

The communities of **Fairview, Fountain Green, Mayfield, Sterling, and Manti** have jurisdictional boundaries or adjacent unincorporated developed land in areas of historically active landslides. For more details see APPENDIX—for maps.

Fairview has historically active landslides to the east, this includes the areas of Mountain Ville Highway, and the Fairview Heights development.

Fountain Green is nestled between active landslide zones. Big Hollow Road and 200 South (outside of jurisdiction) runs through these areas.

Mayfield's East Canyon Road runs through areas of active landslide.

In **Sterling**, all areas north and south of Six Mile Creek is in an active landslide zone. Most of the jurisdiction is in this area.

Manti has a historical precedence for landslide events. The area south east of the city, just outside of Manti Canyon is at particular risk.

Sanpete County Earthquakes

History of Earthquakes in Sanpete County

The last large earthquake took place on the Nephi segment approximately 400 years ago. There is no other recorded damage due to earthquake in Sanpete County. There is no recorded history of earthquake events causing damage in recent history.

Earthquake Assessment for Sanpete County

Frequency	rare
Severity	Catastrophic
Location	Ground shaking will be felt throughout the entire county if a large earthquake were to occur. Surface fault rupture could be expected in areas of known historic fault movements. Liquefaction is expected in areas of high to moderate liquefaction potential, which covers a vast portion of Sanpete County.
Seasonal Pattern	None
Duration	Actual ground shaking will be under one minute yet after shocks may occur for weeks after.
Speed of Onset	No warning
Probability of Occurrence	Unlikely: Less than 1 percent probability of occurrence in the next year or a recurrence interval of greater than every 100 years.

Location and Extent

Earthquakes on the Gunnison Fault of a 6.5 rating or greater occur on average of once every 500 + years. Earthquakes on the Wasatch Fault that extends into Nephi appear to have a greater potential for being larger. It is estimated that 7 + rated quakes occur in this area every 1500 to 3000 years. Sanpete County is at risk from both faults.

In the Sanpete County Assessment meetings several communities expressed concern for the protection of their critical facilities and public buildings. An especial concern is the protection of water resources. The probability of the event greater than 6.5 would be low, and the consequences to building loss to be high especially due to the large amount of mobile homes and non-reinforced block buildings in the area.

The State of Utah ran a HAZUS analysis for three different scenarios. They reported that HAZUS estimates fewer than five total annual casualties across all severity levels from earthquake in all three scenarios for Sanpete County. Direct economic building losses for the county would be \$843,000. \$120,000 of that would be building damage, and \$376,000 of that would be non-structural damage. This equates to a total per capita loss of \$30.30. Overall Sanpete County is ranked 12 out of the 24 counties assessed. This is based off of chance of occurrence, projected loss, and population growth.

Sanpete County Dam Failure

There are thirty-one active dams in Sanpete County. Most of these dams are small detention ponds or livestock watering facilities and most pose a minimal threat to human safety or property.

Seven of these dams are considered as “low hazard” by the State of Utah Division of Water Rights. As defined by state statute, low hazard dams are those dams which, if they fail, would cause minimal threat to human life, and economic losses would be minor or limited from damage sustained. These dams in Sanpete County include: Chester Dams No. 1-5, the Gunnison Irrigation Co Pond #8, and the Wales Dam.

A total of seventeen dams are considered a “moderate hazard”. This ranking indicates that if the dam fails it would have a low probability of causing loss of human life, but would cause appreciable property damage, including damage to public utilities. The moderate hazard dams are as listed: Anderson Pond, Benches Pond, Deep Lake, Duck Fork, Emery, Ferron, Gooseberry, Gunnison irrigation- sediment pond 2, Mayfield Irrigation Regulation Reservoir, Mt. Pleasant- Pleasant Creek (lower), Mt. Pleasant- Pleasant Creek (Upper), Shingle Mill, Spinners, Strates (McKinley), Town Dam, and Willow Lake.

Nine dams are considered as a “high hazard” which means that if they fail, they have a high probability of causing loss of human life or extensive economic loss, including damage to critical public utilities. They are the: Dairy Dam, Fairview Lake, Gunnison Dam, Huntington Dam, Palisades Lake, Nine Mile Dam, and Rolfson dam, Narrows Project (Gooseberry), and the Narrow’s Reservoir Dam. The Piute Dam could be added to this as a tenth high risk dam, as its inundation affects travel north into the southern agricultural area of Sanpete County.

Dam failure inundation maps and emergency action plans for each of the high risk dams can be found on the Utah Division of Water Right’s website at: <http://waterrights.utah.gov/cgi-bin/damview.exe?Startup>. See Map 6.1 in APPENDIX I- Maps.

History of Dam Failure in Sanpete County

No significant dam failures have occurred in Sanpete County

Dam Failure Assessment for Sanpete County

Frequency	Rare
Severity	Limited
Location	Would occur downhill from existing dams.
Seasonal Pattern	None

Duration	Depends on dam and type of break; Could be a wall of water which passes through in a few hours, or a slower break which could last for weeks.
Speed of Onset	6 to 12 hours.
Probability of Occurrence	Unlikely: Less than 1 percent probability of occurrence in the next year or a recurrence interval of greater than every 100 years.

Description of location and extent

The Utah Department of Public Safety/Division of Emergency Management ran GIS analysis and included information about Sanpete County in their 2014 Approved State-wide Hazard Mitigation Plan. The Utah DEM also ran a HAZUS analysis (explain what this is) found that there are about 137 estimated buildings in the inundation zone. The total cost of building exposure is \$23,911,707. This is a per capita cost of \$859.45. There are about 3,101 persons per high hazard dam. Total inundation of 58.5 square miles. This is about 3.7% of the county. Sanpete County as a whole is among the seven counties with the highest risk in the state. Even so, Sanpete has the lowest population growth out the counties with the highest risk.

The areas of greatest danger to dam failure are south of Nine Mile Dam (near Sterling), west of Dairy Dam and Palisades Lake Dam (both near Sterling), south of Fairview Lake Dam (in the mountains east of Fairview), east of Huntington and Rolfson Dams (both in the mountains east of Fairview), and north of Gunnison Dam (near Gunnison). The following is an explanation of the inundation patterns for each high hazard dam. Inundation maps are included in APPENDIX V.

Dairy Dam

This dam is located east of Centerfield. In the case of a breach of this dam, flooding and debris flow would travel west in a linear direction. It would cover the east agricultural land and flood the Centerfield moving in an east to west direction from covering the areas in this direction between the streets of 400 South and 100 North

Fairview Lake

This dam is located east of Fairview City in. Inundation would affect very little development, although it would flood a small stretch of Skyline Drive (off of SR 31).

Gunnison Dam

There is both a moderate risk of inundation and a high risk of inundation in the case of potential dam breakage. This dam is located at the south end of the Gunnison Reservoir, directly north-west of Sterling. Breakage of this dam would flood Highway 89 between Gunnison and Sterling. It would also dip down and flood Mayfield Road (SR 137). High Risk Inundation would cover most agriculture south of Gunnison just before the Centerfield border, and affect the city up to local road 200 south.

Huntington Dam

At the border of Sanpete and Emery County this dam has no effect on development in Sanpete County. Damage to this dam could possibly flood the town of Huntington in Emery County.

Palisades Lake

The failure of the Palisades Dam would have a large inundation extent. Water would affect primarily agricultural land around Palisades Lake and the Gunnison Reservoir. Sterling would be flooded in the north end along Marxville Road. Flooding would travel along Highway 89 and SR 137 and flood a small section of South Gunnison. Agricultural lands south west of Fayette are at risk of flooding as well.

Nine Mile Dam

Located at the Gunnison Reservoir this dam has a similar flood pattern as the Gunnison Dam. It would flood a large portion of Highway 89 between Gunnison and Sterling. It would inundate the south end of Gunnison and agriculture south of Fayette.

Rolfson Dam

The Rolfson Dam has a similar inundation pattern as the Huntington Dam. In the case of a breach it would cause no damage to Sanpete County development, but would affect the community of Huntington in Emery County.

Narrow's Reservoir Dam

The Narrows reservoir is under construction but it is projected to be a high hazard dam.

Piute Dam

This Dam is not located in Sanpete County but its inundation pattern affects a sizeable portion of the Gunnison-Centerfield area. The inundation pattern travels north through the developed portion of Sevier County and into Sanpete. In Sanpete inundation patterns cover primarily agricultural land. Although it reaches as far as the north as the south end of Fayette.

APPENDIX I: CAPABILITIES OF COUNTY AGENCIES

A. *Sanpete County Emergency Management*

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
 - a. Coordinate emergency planning and response activities with numerous county agencies. Planning encompasses preparedness, response, recovery, and mitigation.
 - b. Responsible for everyday operations of the county's Emergency Operations Center.
 - c. Update and keep Emergency Operations Center at operational readiness.
 - d. Update and exercise emergency operations and mitigation plans.
 - e. Coordinate state sponsored training for county agencies including; law enforcement, public health, social services, fire departments, emergency medical services, etc.
 - f. Coordinate the county's Local Emergency Planning Committee. (meets eight times annually)
 - g. Coordinate the county's Tier Two reporting. (hazardous materials)
 - h. Public awareness and educational programs via newspapers, radio, and schools to decrease vulnerability to hazards.
 - i. Work with schools and local businesses to help create site-specific hazard response plans and present in-service education to local business employees.
 - j. Responsible for timely and effective public information releases during emergency situations.
 - k. During a disaster declaration, emergency management has all county resources at their disposal including manpower, communications, and equipment.

1. Have verbal and/or written mutual aid agreements with Juab, Sanpete, Piute, Sevier, and Wayne County Emergency Management Agencies for necessary resources during a disaster situation.
 - m. With effective planning, training, and exercising, emergency management can help to mitigate potential hazards within the county.
 - n. Assist in damage assessment and coordinate with state and federal agencies for recovery assistance.
2. Responsibility and authority in the regulating, inspecting, or funding of projects:
 - a. In coordination with the Six County Association of Governments, assist with applications for federal and state funding such as the Hazard Mitigation Grant Program.
 - b. Involved with inspecting hazardous material storage sites and fulfilling Tier Two reporting requirements.
 - c. Participate in dam inspections with the Army Corp of Engineers.
3. Leadership and coordination with other government agencies:
 - a. Local Agencies: Sanpete County Emergency Management coordinates with appropriate local agencies to ensure preparedness, response, recovery, and mitigation. These agencies include:

 Sanpete County Commissioners, Sanpete County Road Operations, Sanpete County Sheriff's Office, Sanpete County Recorder, Sanpete County Clerk, Sanpete County Building Inspector Operations, Sanpete County Auditor, Emergency Medical Service, Sanpete County Fire Department, Sanpete County Economic Development Office and various other law enforcement, fire, communication, and emergency medical agencies.
 - b. Non-local Agencies: Sanpete County Emergency Management coordinates with numerous state and federal agencies. These agencies include the Utah Division of Emergency Services and Homeland Security, Utah Highway Patrol, State Health Department, Department of Transportation, Federal Emergency Management Agency, and the Natural Resources Conservation Service.

4. General recommendations/Emergency Management concerns:
 - a. Provide listings of eligible mitigation projects so counties can be prepared when funds become available.
 - b. Sanpete County is constantly striving to improve planning and exercise activities and response capabilities. However, with the county growing and becoming more industrial, the threat of potential hazards increases, which increases the need for resources, training, and awareness.
 - c. County needs to add natural hazard mitigation to the General Plan and to the zoning and subdivision ordinances. Based on funding, Six County Planning Staff will work with the county to update the General Plan and the zoning ordinances to reflect natural hazard mitigation. Existing zoning requirements for flood plain management need to be enforced.

B. Sanpete County Road Operations *

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions)
 - a. Design bridges, culverts, and overflow sections. The County Road Operations follows a very detailed list of design standards for all projects within the county.
 - b. Continually working with the Department of Transportation on various projects since the DOT dispenses federal funding. While the DOT provides technical advice concerning guidelines and standards, they do not provide equipment, materials, or personnel.
2. Responsibility and authority in the regulating, inspecting or funding of projects:
 - a. Responsible for and have authority to regulate and inspect all projects completed within the county.
 - b. All projects funded by the state or federal government are designed by a consulting engineer and meet the usual acceptable federal standards. Inspection of federal aid projects is the responsibility of the consulting engineering company and is overseen by the county to ensure standards are met. Many county projects are designed with in-house expertise and engineers are consulted if problems arise.

- c. All funding in one-way or another comes through the county, whether it is a certain percentage of the federal aid project or 100% of the county projects.
3. Leadership and coordination with other government agencies:
- a. Local Agencies: The County Road Operations has little interaction with other county agencies concerning roads and bridges. They do, however, coordinate with various county agencies concerning right of way and right of way purchasing. The legal aspect of right of way purchasing is overseen by the States Attorney's Office. The land values are usually developed by the Tax Equalization Office and approved by the County Commission.
 - b. Non-local Agencies: The County Road Operations coordinates with various State and Federal agencies for technical assistance, permitting, environmental concerns, archeological sites, and cultural issues. These agencies include the Utah Department of Transportation, US Fish and Wildlife, Corp of Engineers, and the Utah Historical Society.
4. General recommendations/Emergency Management concerns:
- a. Sanpete County Road Operations should assist local government with floodplain management and water development permitting.

C. Central Utah Public Health

- 1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions)
 - a. Deal with bona fide health hazards using cause and effect in those areas for both mitigation and risk reduction. If it is a hazard affecting any number of persons and within the scope of public health, Central Utah Public Health (CUPH) will mitigate or exercise risk reduction through several methods ranging from enforcement of statutes to immunization programs.
 - b. Environmental Health has the knowledge and also access to the State Health Department for mitigation of incidents with hazardous or toxic wastes.
 - c. Programs include; waste water treatment, water pollution, public health nursing, immunization programs, solid waste regulation, food establishment inspections, air quality, and vector control.

2. Responsibility and authority in the regulating, inspecting or funding of projects.
 - a. CUPH Health is a unit of state government that operates through agreements or Memorandums of Understanding with the Utah Department of Health to enforce state public health statutes within the Six County district. Tax levies provide funding. There are no funding programs for non-operational programs.
3. Leadership and coordination with other government agencies:
 - a. Local Agencies: Within the scope of public health, CUPH coordinates with the following local agencies; Sanpete County Emergency Management, local law enforcement agencies (city and county), local school boards, and planning and zoning agencies.
 - b. Non-local Agencies: Within the scope of public health, CUPH coordinates with the following agencies; Utah Department of Health and state and federal law enforcement agencies.
4. General recommendations/Emergency Management concerns:
 - a. Public Health is normally under funded and understaffed at all levels of government. Should CUPH be called upon for expertise at a time of emergency or disaster, it normally does not have instrumentation for site level determinations of any kind without support from other agencies.
 - b. Public health agencies should be included in equipment storage; e.g., FEMA equipment "stored" and used at public health agencies, rather than being stored at a warehouse. For example, radio equipment that belongs to FEMA is based at county emergency management offices; the same could be done with air sampling equipment or other instruments/kits etc., which could be used by public health agencies both for daily work and at a time of emergency or disaster.

D. Sanpete County Sheriff's Office

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
 - a. Responsible for law enforcement and criminal investigation in unincorporated areas of the county and in smaller towns that do not have police departments.

- b. Provide standard law enforcement manpower and equipment.
 - c. In disaster situations, provide; warning, rescue assistance, evacuation assistance, security, traffic control, and information assistance.
 - d. Provide public awareness and educational programs. (911 education, safe kids program, etc.)
 - e. Have mutual aid agreements with all surrounding counties and the Utah State Highway Patrol.
2. Responsibility and authority in the regulating, inspecting, or funding of projects:
 - a. None
 3. Leadership and coordination with other government agencies:
 - a. Local Agencies: Within the scope of law enforcement, the Sanpete County Sheriff's Office coordinates with various local agencies. These agencies include Sanpete County Emergency Management and various local police departments.
 - b. Non-local Agencies: Sanpete County Sheriff's Office coordinates with appropriate state and federal agencies including; Utah Highway Patrol, Utah Attorney Generals Office, Bureau of Criminal Identification, Utah Department of Transportation, and Federal Bureau of Investigation.
 4. General recommendations/Emergency Management concerns:
 - a. None

E. Sanpete Fire District

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
 - a. Respond to fires in order to protect lives, limit injuries, and minimize damage to property and the environment.
 - b. Respond to accidents in order to provide rescue assistance.

- c. Assist Emergency Medical Services in providing emergency assistance to sick and injured. (first responders)
 - d. Provide standard firefighting manpower and equipment.
 - e. Respond to spills and releases of hazardous materials and assist in mitigating the detrimental human and environmental effects of these occurrences.
 - f. Respond to emergencies resulting from natural occurrences such as storms, floods, etc., and assist in mitigating the detrimental results of these occurrences.
 - g. Provide training for department members that will enable them to effectively and efficiently carry out their respective duties and responsibilities.
 - h. Develop and provide educational programs that promote the prevention of fires and encourage fire-safe and fire-smart activities.
 - i. Assist in enforcement of city fire ordinances.
 - j. Fire investigation.
 - k. Provide assistance to other jurisdictions, as department resources and commitments allow. Sanpete Fire District has mutual aid agreements with Juab, Sanpete, Piute, Sevier and Wayne Counties.
 - l. Inspections and preplanning within the fire district to reduce hazards and aid in fire prevention.
 - m. Assist with the county's tier two reporting. (Hazardous materials storage sites)
 - n. In disaster situations, provide assistance in warning, rescue, evacuation, and situation updates.
2. Responsibility and authority in regulating, inspecting, or funding of projects:
- a. None

3. Leadership and coordination with other government agencies:
 - a. Local Agencies: In efforts to decrease vulnerability to hazards, the Sanpete Fire District coordinates with various local agencies. These agencies include Sanpete County Emergency Management, Mt Pleasant Police Department, Moroni Police Department, Sanpete County Sheriff's Office, Mt Pleasant Fire Department, Manti Fire Department, Ephraim Fire Department, Gunnison Fire Department, other local police and fire departments, local Public Works, and local Emergency Medical Services.
 - b. Non-local Agencies: Utah State Fire Marshal and the Federal Emergency Management Agency.

4. General recommendations/Emergency Management concerns:

Our district has seen an increase in number and variety of calls. As first responders, we have to train and equip our fire departments for various situations that may arise, such as: vehicle extrication, various types of hazardous materials, and many other types of responses. Each added type of response increases the need for equipment and the time our volunteers need to spend in training. With the recent decrease in population in our district, volunteer retention and recruitment is also a concern.

- a. Seek funding outside of the district for additional equipment that will improve the effectiveness of our responses as well as increase the margin of safety for our volunteers.
- b. Explore training options to cover the expanding variety of responses in our district.
- c. Look into recruitment and retention programs that will work in our district.

F. Utah State University Extension Service *

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
 - a. The Utah State University Extension Service provides practical, research-based information and educational programs to address critical issues facing individuals, families, agricultural producers, business operators, and communities.

- b. County Extension Agents serve as subject-matter experts, educational planners, adult and youth teachers and community facilitators in several areas including agriculture and natural resources, horticulture, family and consumer sciences, 4-H and youth community development.
 - c. Provide planning, designing, implementing, and evaluating of educational programs for livestock and forage clientele.
 - d. Areas of responsibility include beef and dairy cattle, swine, other livestock, water quality, waste management, and forages.
 - e. Provide programming for county citizens in the areas of family financial management, environmental concerns, housing, health and wellness, aging, foods and nutrition, parenting, and human development.
 - f. Serve as an information resource in dealing with drought, winter storms, summer storms etc. in relation to agriculture, environment, water resources, etc.
 - g. Assist with damage assessment related to agriculture.
2. Responsibility and authority in regulating, inspecting, or funding of projects:
- a. Authority is at federal level.
3. Leadership and coordination with other government agencies:
- a. Local Agencies: Sanpete County Emergency Management and Central Utah Public Health.
 - b. Non-local Agencies: Utah State University, Utah State Health Department, United States Department of Agriculture, and Farm Service Agency.
4. General recommendations/Emergency Management concerns:
- a. None.

APPENDIX II: MITIGATION CAPABILITIES OF COMMUNITIES

Centerfield Capability Assessment

*Information from City Council

Planning and Regulatory				
Plans	Year	Does the plan address hazards?	Does the plan identify projects to include in the mitigation strategy?	Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	No			
Capital improvements plan	No			
Economic Development Plan	No			
Local Emergency Operations plan	No			
Transportation plan	No			
Stormwater Management Plan	No			
Community Wildfire Protection Plan	Yes	Sanpete County Fire District		
Building Code, Permitting, and Inspections	Year	Are Codes adequately enforced?		
Building Code	No			
Building Code Effectiveness Grading Schedule (BCEGS) Score	No			
Fire department ISO rating	Yes	Score: 6		

Site plan review requirements	No	
Land Use Planning and Ordinances	Yes/No	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning Ordinance	Yes	Planning and zoning committee
Subdivision ordinance	No	
Floodplain ordinance	No	
Natural Hazard Specific Ordinance	Yes	Sanpete fire district
Flood insurance rate maps	No	
Acquisition of land for open space and public recreational uses	No	
How Can these Capabilities be expanded to improve to reduce risk? n/a		

<u>Administrative and Technical</u>		
Administration	Describe Capability	Is coordination effective?
Planning commission	No	
Mitigation Planning Committee	No	
Maintenance programs to reduce risk (e.g. tree trimming, clearing drainage systems)	No	
Mutual aid agreements	No	
Staff	Yes/No FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief building official	Yes	Sanpete building inspector
Floodplain administrator	No	
Emergency manager	No	
Community planner	No	

Civil engineer	No	
GIS Coordinator	No	
Technical	Describe Capability Has capability been used to assess/mitigate risk in the past?	
Warning systems/services (reverse 911, outdoor warning signals)	none	

Financial (funding and tax related capabilities)

Funding Resource	Access/Eligibility (Yes/No)	Has the funding resource been used in past and for what type of activities?	Could the resource be used to fund future mitigation actions?
Capital Improvements project funding	No		
Authority to levy taxes for specific purposes	No		
Fees for water, sewer, gas, or electric services	No		
Impact fees for new development	No		
Storm utility fee	No		
Incur debt through general obligation bonds and/or special tax bonds	No		
Incur debt through private activities	No		
Community Development Block Grant	No		
State funding programs	Yes	CIB	

Education and Outreach

Program/Organization	Describe program/organization and how relates to disaster resilience and mitigation.	Could the program/organization help implement future mitigation activities?
Ongoing Public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)	Yes	GVFD/ Provides Emergency Service

Moroni Capability Assessment

* Information from Mayor Luke Freeman

Planning and Regulatory				
Plans	Year	Does the plan address hazards?	Does the plan identify projects to include in the mitigation strategy?	Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	No			
Capital improvements plan	No			
Economic Development Plan	Yes	A basic ordinance, but is outdated		
Local Emergency Operations plan	Yes	Under review, but will be complete within a few months		
Transportation plan	no			
Stormwater Management Plan	No			
Community Wildfire Protection Plan	no			
Building Code, Permitting, and Inspections	Year	Are Codes adequately enforced?		
Building Code	Yes	Version/Year: Two ordinances. 2013		
Building Code Effectiveness Grading Schedule (BCEGS) Score	No			
Fire department ISO rating	No	Score:		
Site plan review requirements	No			
Land Use Planning and Ordinances	Yes/No	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance		

		adequately administered and enforced?
Zoning Ordinance	Yes	2013 update
Subdivision ordinance	Yes	2013 update
Floodplain ordinance	Yes	2013 update
Natural Hazard Specific Ordinance	No	
Flood insurance rate maps	No	
Acquisition of land for open space and public recreational uses	No	
How Can these Capabilities be expanded to improve to reduce risk? All items need constant reruns and education		

<u>Administrative and Technical</u>		
Administration	Describe Capability	Is coordination effective?
Planning commission	Yes	Capable
Mitigation Planning Committee	No	Managed by council
Maintenance programs to reduce risk (e.g. tree trimming, clearing drainage systems)	Yes	As needed per issue
Mutual aid agreements	No	
Staff	Yes/No FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief building official	No	Handled by planning and zoning council
Floodplain administrator	Yes	Council member
Emergency manager	Yes	Council member
Community planner	Yes	Planning and zoning and council
Civil engineer	No	Outsources as needed
GIS Coordinator	No	Outsources as needed
Technical	Describe Capability	

	Has capability been used to assess/mitigate risk in the past?
Warning systems/services (reverse 911, outdoor warning signals)	Yes- Warning/siren system → coordinated with county

Financial (funding and tax related capabilities)

Funding Resource	Access/Eligibility (Yes/No)	Has the funding resource been used in past and for what type of activities?	Could the resource be used to fund future mitigation actions?
Capital Improvements project funding	No		
Authority to levy taxes for specific purposes	Yes		
Fees for water, sewer, gas, or electric services	Yes		
Impact fees for new development	Yes	Not used however	
Storm utility fee	No		
Incur debt through general obligation bonds and/or special tax bonds	No		
Incur debt through private activities	No		
Community Development Block Grant	Yes		
State funding programs	Yes	CIB	

Education and Outreach

Program/Organization	Describe program/organization and how relates to disaster resilience and mitigation.	Could the program/organization help implement future mitigation activities?
Ongoing Public education or information program (e.g. responsible water use, fire safety, household preparedness, environmental education)	None	

APPENDIX III: OTHER AGENCY RESOURCES

A. Mitigation and risk reduction:

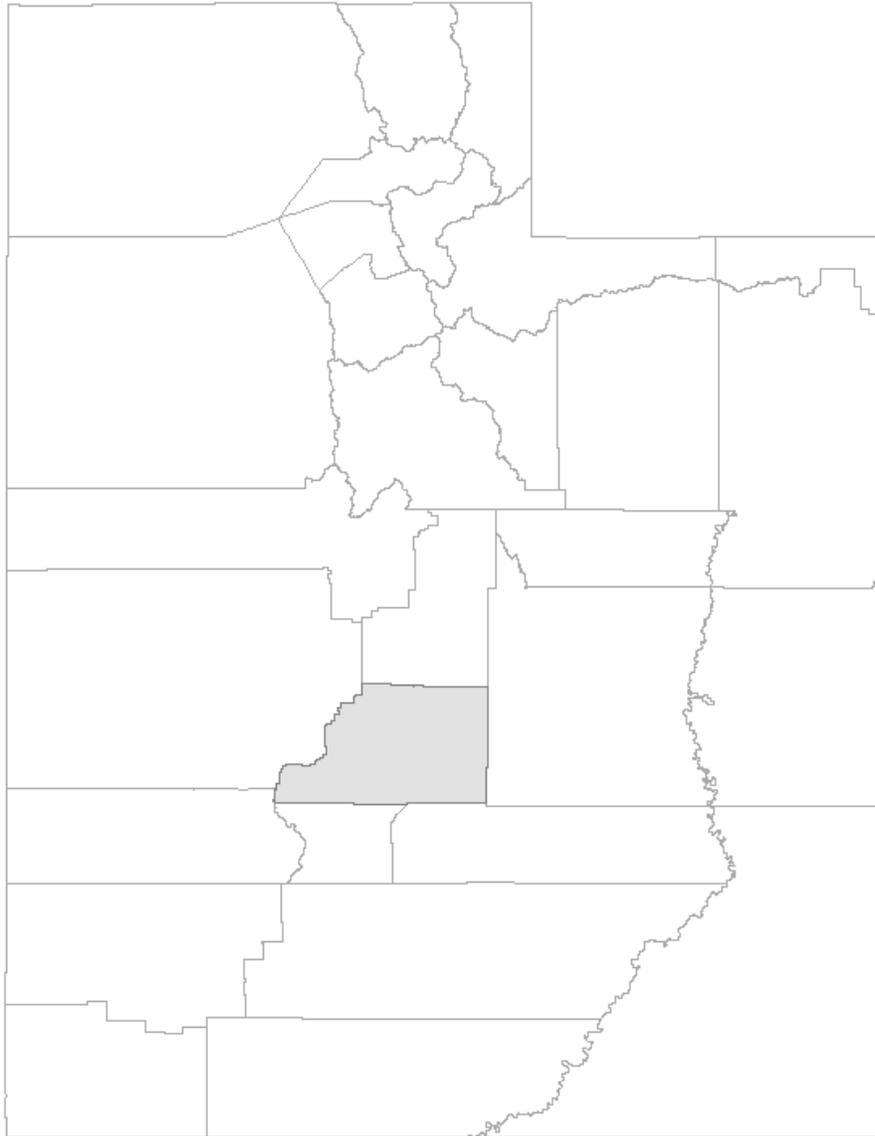
1. Sanpete County Social Services: Temporary assistance to needy families, food stamps, medically needy programs, adult services, homeless assistance, family planning, etc.
2. Army Corps of Engineers: Water and dam management within the county. Provide technical expertise, sandbags, and heavy equipment.
3. Utah Highway Patrol: Situation and damage assessment; provide transportation resources for movement of state personnel, supplies, and equipment to include air and ground reconnaissance; traffic control.
4. State Fire Marshal: Hazmat route utilization; HAZMAT technical assistance; situation and damage assessment.
5. Forestry, Fire & State Lands: Debris removal from recreational facilities; technical assistance; situation and damage assessment.
6. Utah Division of Wildlife Resources: Technical assistance; debris removal from recreational facilities; facility improvements; situation and damage assessment.
7. State Radio Communications: Exercise readiness of warning systems and communication support.
8. Department of Agriculture: Assists with situation and damage assessment; coordination with USDA; HAZMAT technical assistance; state land use program.
9. Department of Workforce Services: Situation assessment and administration of disaster unemployment assistance programs.
10. Human Services: Insure liaison with private relief agencies for disaster victims.
11. State Historical Society: Project screening and situation assessment.

APPENDIX IV: LANDSLIDE MAPS

Section 6

Sevier County

Natural Hazard Assessment for Pre-Disaster Mitigation



Prepared by Chelsea Bakaitis, Six County AOG

Contents

Introduction.....	1
Background Information.....	1
Capability Assessment.....	2
Sevier County Capabilities	2
Central Valley Capabilities.....	2
Glenwood Capabilities.....	2
Joseph Capabilities.....	3
Monroe Capabilities.....	3
Redmond Capabilities.....	3
Critical Facilities.....	4
Sevier County Flooding.....	6
History of Flooding in Sevier County.....	6
Flood Assessment for Sevier County.....	9
Location and Extent	9
Assessing Vulnerability: Addressing Repetitive Loss Properties.....	12
Sevier County Wildfires	13
History of Wildfires in Sevier County.....	13
Wildfire Assessment for Wayne County	13
Location and Extent	14
Sevier County Landslides.....	15
History of Landslides in Sevier County.....	15
Landslide Assessment for Sevier County	15
Table 6-8: Hazard Profile for Landslides in Sevier County	15
Location and Extent	15
Sevier County Earthquakes.....	17
History of Earthquakes in Sevier County	17
Earthquake Assessment for Sevier County.....	17
Table 6-9: Hazard Profile for High Intensity Earthquake in Sevier County.....	17
Location and Extent	18
Sevier County Dam Failure	19
History of Dam Failure in Sevier County.....	19
Dam Failure Assessment for Sevier County.....	19
Extent and Location	20
APPENDIX I: CAPABILITIES OF COUNTY AGENCIES.....	i
APPENDIX II: OTHER AGENCY RESOURCES.....	xi

Introduction

This document is an overview of natural hazards in Sevier County. It tells about the history of hazards and defines present and future projected risks. It serves as an annex of the general SCAOG Regional Pre-Disaster Mitigation Plan and is divided into sections covering the following hazard topics: flooding, wildfires, landslides, earthquakes, and dam failure. Each section contains information about the history of the hazard, and an assessment of the extent and location of the hazard. Sevier County Emergency Manager, Lt. Cody Barton of the Sheriff's office was consulted throughout the planning process. His coordination efforts are appreciated. All municipalities were also invited to participate.

Background Information

Approximately 294,902 acres or 22% of the total land area in Sevier County is privately owned. There are not very many residences outside incorporated communities. The State and federal government owns about 78% of land. Aside from extractive industry, much of this land is beyond the reach of development.

Of the privately held land, most is not developable due to a lack of water and county zoning requirements of water access. Other limitations to development include steepness of the terrain, flash flood plains and accessibility. There is still plenty of infill within city limits that can be utilized for safe development without developing in unincorporated, sparsely populated, or hazardous areas.

Sevier County requires UBC on all new or proposed buildings. New subdivisions require a grading and drainage plan to mitigate any flooding, which may occur. Since most of the privately held land is along the I-70 corridor from Salina to Joseph, development is occurring in this area. As the largest city in the region and due to its central location, Richfield plays host to several state and federal agencies. Situated along I-70 and US 89, the city has also seen most of the county's recent growth.

Figure 6-1: Participating Wayne County Jurisdictions

- Annabella
- Aurora
- Central Valley
- Elsinore
- Glenwood
- Joseph
- Koosharem
- Redmond
- Richfield
- Monroe
- Salina
- Sigurd

Capability Assessment

A capability assessment looks at “safeguards” that jurisdictions have in place to prevent or mitigate disasters. These measures include: planning and regulatory policies, administrative and technical roles, tax and funding resources, and educational/outreach programs. For the filled out capability assessments by the communities please see APPENDICES I through III on county and community capabilities.

Sevier County Capabilities

Sevier County has several different agencies which support mitigation actions. The Emergency Management of the county helps coordinate mitigation and risk reduction. This group also works with Six County AOG in the making of the mitigation plan. The County Highway Department also works to mitigate risk by making sure roadways are properly maintained with proper equipment to prevent flooding and overflow. Central Utah Public Health acts as a state agency but assists with preventing health hazards in the case of a disaster. The County Sheriff’s Department is responsible for law enforcement in unincorporated areas and smaller towns without departments. It works with the Sevier County Fire District in being a response to emergencies. Educational outreach is provided by the Utah State University Extension Service. It provides agricultural and environmental information in dealing with drought and winter storms. It coordinates with Sevier Emergency Management and Public Health. A more detailed list of agencies and their roles can be found in APPENDIX I- Capabilities of Counties.

Central Valley Capabilities

There are several planning and regulatory measures in place in Central Valley. Disaster is addressed in the Master and Capital Improvement plans. There is also a Local Emergency Operations Plan and a Continuity of Operations Plan. The community also enforces building codes and ordinances (zoning, subdivision, and floodplain). On an administrative and technical level the community has a planner and planning commission with a separate mitigation planning committee. The CV Community Emergency Response Team (CERT) has a mutual aid agreement with the Monroe Town CERT. The Community has access to the following funding resources for hazard mitigation: Capital improvements projects funding, levied taxes, water, impact fees, CIB and CDBG. The CERT program focuses on emergency preparedness for the community.

Glenwood Capabilities

There are no substantial plans for disaster response or mitigation in Glenwood. Although there is a Stormwater Management plan. The community had a drainage study completed in 2014 and are up-to-date on their flood insurance rate maps. They also have building codes as well as zoning and subdivision ordinances in place. The Planning Commission, Mayor and City Council provide technical and administrative assistance for local emergency management. There’re not a lot of local funding sources for mitigation projects, all though money is gathered from impact fees for new development. CDBG funds have also been used for road and bridge reconstruction project. Glenwood has no disaster-related community outreach or education programs.

Joseph Capabilities

The community of Joseph has the following planning and regulatory measures for mitigation in place: Master Plan, Capital Improvements Plan, Local Emergency Operations Plan, Stormwater management plan, and a community wildfire protection plan. The community updated their building codes in 2006. The zoning, subdivision, and floodplain ordinances are used as effective measures for reducing impacts. The community also has a planning commission, building official, and emergency manager in place for mitigation project planning. County capabilities such as GIS and Civil engineering are used by the city. They have used CIP funding, water utility fees, impact fees, bonds, CDBG, and CIB for upgrades and maintenance to the culinary water system. These sources are also available for other related hazard mitigation projects. There are no disaster response community education programs in the town. *Note: two different capability assessments were submitted (filled out by different officials). As you can see in appendix, the two documents may contradict each other. In these cases information was taken from the assessment that better suited the official's charge.

Monroe Capabilities

Possible mitigation projects are addressed in Monroe's Capital Improvements Plan (created by AOG). The community also has a set building code and ordinances reduce risk to current and new development. Although they do not have a separate Mitigation Planning Committee the community has an emergency manager, building code official, community planner, civil engineer, GIS coordinator and planning commission that work towards pre-disaster mitigation. They are able to draw financial resources for projects from CIB, levied taxes water fees, impact fees, CDBG, and other state and federal programs. The CERT program provides community-wide education.

Redmond Capabilities

Redmond is able to address mitigation the town's Capital Improvements Plan (created by AOG). Stormwater issues and mitigation efforts are also planned for in a Stormwater Management Plan. The community also has a new set of building codes approved in 2014 and a part-time inspector to enforce them. Although the zoning and subdivision ordinances are not always enforced. There are warning sirens in place. The Planning Commission, City Council, and Mayor perform any administrative duties necessary for hazard planning. There are also mutual aid agreements with other communities in place. The Redmond water system was recently updated with Capital Improvement Funding, which can be used for mitigation projects as well.

No capability information was received from the listed municipalities:

- Annabella
- Aurora
- Elsinore
- Koosharem
- Richfield
- Salina
- Sigurd

Critical Facilities

Critical facilities are given special consideration when planning mitigation projects: They are the activities and facilities that even a slight chance of a hazard is a great threat. Critical facilities include hospitals, fire stations, police stations, critical records, water treatment, and other similar facilities. Sevier County and each of its municipalities were asked to list their critical facilities and define what natural hazards pose the greatest risk to each facility. The following charts outline information given by the municipalities of their critical facilities and what natural hazards posed the greatest threat to these facilities.

Table 6-2: Sevier County Critical Facilities		
Critical Facilities	Greatest Risk	History of Damage
Central Valley Town Critical Facilities		
Water system	Earthquake	None
Glenwood Town Critical Facilities		
Town Hall Spring Source	Flooding Earthquake	None
Redmond Town Critical Facilities		
Sewage Pump	Earthquake	None
Joseph Town Critical Facilities		
Town Hall Sevier Power Station Store Culinary Well Culinary water storage tanks Community center	Flood, high wind, trees into power lines, earthquake, river flooding	none
Monroe City Critical Facilities		
Monroe City Fire Station EMS Building (4) Power Generating Plans Culinary Water Plant Irrigation Storage Pond (3) Schools City Hall Sand H Debris Basin (Flood Control Structure) (2) Medical Clinics Andy's Market Grocery Store and Pharmacy Texaco Gas Station Assisted Living Facility	Flooding (areas in Canyons and drainage Basins) Alluvial Fan flooding and debris flow hazards Unstable soils Rock-Fall/rock outcrops on mountain slope East on Monroe Earthquake Wind storms Indoor-Radon Chemical Hazards Wildfire	None

Fishlake National Forest Critical Facilities		
Fishlake Basin Sewer System	Fishlake Basin Sewer System	none
Monroe City Culinary Water/power	Monroe City Culinary Water/power	

No critical facility information was received from:

- Annabella
- Aurora
- Elsinore
- Koosharem
- Richfield
- Salina
- Sigurd
- County (unincorporated facilities)

Sevier County Flooding

Sevier County experiences major flooding along the I-70 corridor. In this area are important watersheds and wetlands. These factors have impaired development in some areas. Flooding is primarily attributed to melting of heavy snow pack, rainstorms and rising ground levels.

History of Flooding in Sevier County

Historically flood disaster has had the highest cost impact on agriculture. With recent development of the Interstate System, flooding has also impacted major artillery roads.

According to the 2014 Utah Flood Assessment, Sevier County had about 14 people per insurance claim from 1978 to February 4, 2014. The county has had a total per capita NFIP claim of \$1,485 in these years. In comparison, Sanpete has had \$2,791, Emery has had \$2,2187, Wayne has had \$2,737, Piute has had \$0, Beaver has had \$3,251, and Millard has had \$165.

This report also found that between 1980 and 2012 there has been a total of \$5,911,216 in property loss and \$5,489,724 in crop loss. This is a total loss of \$11,400,940 in 32 years, but puts Sevier County as having the 16th most expensive flood damage out of the 29 counties of Utah. This information was gathered from the SHEL DUS database. For details on specific major floods, please see chart below:

Date	Location	Critical Facility or Area Impacted	Comments
July 11-17, 1896	Koosharem, Annabella, Elsinore, Joseph, Monroe, Richfield, Sevier, and Sigurd.	Widespread damage	Koosharem inundated.
1896-1929	Monroe	Unknown	13 floods impacted Monroe over 33-year timeframe.
July 31, 1943	Monroe	Homes farmlands, crops, and livestock	\$80,000 in damage. Canyon on East Mountain
Aug 5, 1943	Monroe	Extremely heavy rains damage homes, highways, canals, crops, city pipelines, and power plant.	\$120,000 in damage city without power for two weeks
July 27, 1951	Salina	Property and residential areas	Source was East Canyon.
Sept 5, 1960	Glenwood/ Sigurd	Roads, bridges, and property	\$15,000 plus. Highway 119 and 24 extensively damaged
July, 31,	Richfield	U.S. 89 damaged along	Source: Cottonwood

1961		with irrigation canal	Canyon
Aug 11, 1961	Richfield	Property damage in northeast section of city.	Source: Cottonwood Canyon. Damage \$3,700.
Aug 15, 1964	Sigurd/Aurora	Crops and irrigation system.	Anderson Wash and Lost Creek, \$1,600
Aug 17, 1965	Annabella/Glenwood	Crops, farms, roads, and fences.	\$38,000 in damage
Aug 6, 1967	Richfield/Central	Damage to homes, farms, and crops.	Source: Flat and Cottonwood Canyons. \$30,000 in damage.
July 24, 1968	Richfield	Damage to homes	
July 30, 1968	Richfield/Elsinore	U.S. 89 covered with debris and water. Farmlands and buildings damaged.	Source: Flat and Cottonwood Canyons.
Aug 8, 1968	Richfield	Farmlands and buildings	Source: Cottonwood Creek. \$2,000+ in damages.
July 24, 1969	Redmond/Sigurd	Farmlands and irrigation canals.	
July & Aug 1970		Crops and property	\$150 Crop damage \$315,211 property damage (ADJ 2013)
July 1971		Crop and property damage	\$2,876 crop damage \$28,760 property damage (ADJ 2013)
Sept 1972		Property damage	\$2,143 property damage (ADJ 2013)
May 1983	Monroe, Richfield, and Salina	Damage in all sectors.	Source Sevier River, Monroe, Cottonwood, and Salina Creek \$5,568,870 crop damage \$5,568,870 property damage Landslide dammed Spanish Fork, Presidential disaster for 22 counties.
1984	County wide	All sectors impacted by event loss to road, culverts, agriculture,	Public assistance totals \$185,545 (1984 dollars) runoff from greater than

		sewer, infrastructure, flood controls, etc.	average snowpack. Affected several other counties.
July 1985		Property damage	\$54,125 property damage (ADJ 2013)
1986	Glenwood	Flooding in center of town	
Aug 1991		Crop and property damage	\$85 crop damage \$171 property damage (ADJ 2013)
May 1994		Property damage	\$20 property damage
Aug 1996		Crop and property damage	\$20,000 crop damage \$29,694 property damage (ADJ 2013)
Sept 1997		Property damage	\$10,160 property damage (ADJ 2013)
Sept 1998		Crop and property damage	\$1,264 crop damage \$7,695 property damage (ADJ 2013)
Jan 2005		MORE INFO: How affect Sevier	
April-June 2005		Property damage	\$2,982 property damage (ADJ 2013) Presidential Declared Disaster for seven counties and two Indian Reservations. Heavy rainfall for several weeks.
April-July 2011		Property damage	Presidential Declared Disaster for several counties. Record snowpack, heavy spring rains. \$155,346 property damage \$11.34 per capita impact
July 29, 2014	Richfield	Damage to some business outdoor	canal breached

		property, frontage road closure	
Aug, 2014	Annabella		
Source: History of Sevier County, Utah State Historical Society, SHELDUS, Richfield Reaper News, Utah Division of Emergency Services 2014 PDM update, USACE Flood Hazard Identification Study for SCAOG, 2003			

Flood Assessment for Sevier County

Severity	Limited, but annual flooding
Location	Flooding would occur in and along flood plains and wetlands. Along I-70 corridor
Seasonal Pattern	Sevier County's main flooding threat is from snowmelt runoff during spring months and heavy rainstorms
Duration	The type of event determines the duration of flooding; flooding due to summer thunderstorms can last a couple of hours whereas flooding due to spring runoff can last weeks.
Speed of Onset	Six to twelve hours.
Probability of Future Occurrences	Highly Likely: 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years

Location and Extent

As a whole, Sevier County has a limited flood threat, although this hazard affects residences and agricultural production every few years. Some areas even have annual flooding. Given existing and potential future development, areas around the Sevier River is most likely to see impacts related to flooding

All jurisdictions are at a likely risk for annual flooding, as reflected in their participation in the National Flood Insurance Program (NFIP). See Table 6-3 for a list of jurisdictions and their Flood Insurance Rate Map (FIRM) effective date and their date of entry into the program.

In 2012 the county-wide Flood Insurance Study (FIS) was revised. The FIS specifically looks at Monroe City, and the Towns of Annabella, Central Valley, Elsinore, Joseph, and Koosharem,

Community Name	Current Effective Map Date	Date of Entry
Annabella, town of	12/18/2012	10/30/1979
Aurora, city of	01/12/82	12/4/1979
Central valley, town of	12/18/2012	12/18/2012
Elsinore town of	12/18/2012	08/14/1979
Glenwood, town of	07/01/1986	07/01/1986
Joseph, town of	12/18/2012	08/28/1979
Koosharem, town of	Not Special Flood Hazard Area (NSFHA)	02/02/1984
Monroe city, city of	12/18/2012	07/24/1979
Redmond, town of	Not Special Flood Hazard Area (NSFHA)	11/30/1983
Richfield, city of	12/18/2012	09/29/1986
Salina, city of	09/29/1986	09/29/1986
Sevier county	12/18/2012	07/01/1986
Sigurd, city of	01/01/1986	01/01/1986

and portions of the Unincorporated Areas of Sevier County. Portions of Richfield were included in the county-wide study, but a separate complete FIS for Richfield was also published.

Redmond was declared as a non-flood prone community. Flood Insurance Rate Maps (FIRMS) were updated for Annabella, Central Valley, Elsinore, Joseph, Monroe, Richfield, and Sevier Unincorporated.

The State of Utah ran a HAZUS loss estimate model for a 100-year flood in the county. HAZUS is a computer modeling program that runs analysis on various scenarios for estimating potential losses from disaster. It was developed by the Federal Emergency Management Agency (FEMA).

A 100-year flood zone is an area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent chance flood is also referred to as the base flood or 100-year flood. A map of Sevier County's 100-year flood zone is included.

The model estimated that in the case of a significant disaster event 13 buildings would be damaged (buildings within the 100-year flood zone). There would be a total building loss of \$2,229 but building exposure costs would run up to \$965,778. The damage to contents of these buildings would be about \$3,009, but the exposure would lead to a \$634,500 cost.

In 2011 Sevier County was over all ranked at low vulnerability for flood loss estimates by the HAZUS model. This information was provided by Utah Division of Emergency Services (UDEM). Vulnerability scores are based off of flood occurrence and potential damage. This estimate is based off of 2000 census data, and so may need to be adjusted for the rapid increase in development in Sevier County.

Even so, a per capita loss estimate based on HAZUS data was assessed by 2012 population estimate data. Sevier's per capita impact of a 100-year flood would be \$0.26. Compared to the rest of the state is a low per-capita cost impact.

An August 2003 report titled Flood Hazard Mitigation Study of the Six County Association of Governments by the U.S. Army Corps of Engineers was completed to help communities without floodplain data. This study generally identified areas of concern for municipalities and the county. However, this report only intended to give communities very general estimates of where flood risk may exist.

The USACE study found that most flood risk in **Unincorporated Sevier** was areas adjacent to the Sevier River and other major rivers and creeks (and their tributaries). About 18 percent of the population lives in unincorporated areas of the county.

Flooding in **Richfield** has come out of Dairy, Rulon, Lind, Tank, and Cottonwood Canyons. The Sevier Valley-Piute Canal also is just about the city of Richfield and has been the cause of flooding. This happens when floods deposit debris and sediment in the canal, causing it to breach (FIS 2012).

Elsinore is flooded by the Sevier River at the south end of the Town. The construction of I-70 has helped eliminate flooding from Albinus and Raphaelsen Canyons. Two detention ponds at the mouths of these canyons have also been constructed to prevent overflow of the streams near Elsinore Town (FIS 2012).

I-70 helps to prevent flooding in **Joseph** from the mountains to the west. This discharge is temporarily stored in a borrow area and empties through three I-70 culverts and Connection underpass toward Joseph. A large gravel pit intercepts and stores the discharge coming from the I-70 culverts. The canal will only intercept small amounts of discharge since it is assumed to be full during flooding conditions. These measures were not planned as flood prevention, so they only provide minimal assistance (FIS 2012). If the canal bank failed the town would be at risk of a flood disaster in businesses and homes. Although there is this vulnerability, city officials consider a major flood as having an occasional probability of occurring (1 to 10 percent probability of occurrence in the next year or recurrence interval of 11 to 100 years) (Community Assessment 2014).

Koosharem area has several square miles that are large drainage areas for Koosharem Creek (USACE 2003). It is considered a Non-Special Flood Hazard Area (NSFHA).

Monroe Creek has a drainage area of 39 square miles at **Monroe**. There is a potential of flood damage below Bohman Road (USACE 2003). Officials note that 50-60% of the community has the potential for flooding (Community Assessments 2014).

Salina is at risk of flood damage by Salina Creek. There are structures within the 100-year flood plain of this creek. They are primarily single family residences and small businesses (USACE 2003).

There is flood threat for **Central Valley** along the Sevier River. Residences and agriculture are at risk from flooding. Even so, flooding is occasional. There has only been significant flooding in the past 25 years (Community Assessment 2014).

The community of **Redmond** is considered a Non-Special Flood Hazard Area (NSFHA). City officials consider flooding to be a minimal threat.

Assessing Vulnerability: Addressing Repetitive Loss Properties

There are no repetitive loss properties in Sevier County (FEMA, 2014).

Sevier County Wildfires

Most of the wildfires in Sevier County pose little threat to life and property. Even so, Wayne is part of the Colorado Plateau. This semi-arid climate makes the area vulnerable to wildfire.

History of Wildfires in Sevier County

Like most western rural counties, every year there are wildfires in the County. The extent and damage of these wildfires is what this report examines. Historically most wildfires have occurred east of Richfield City and in the southern part of the county. The following table lists major wildfires that caused damage to development in the past 20 years.

Date	Location	Critical Facility or Area Impacted	Comments
1997	Flat Fire	One death	6,200 Acres; Wildfire- Flat Fire
August 2000	Near Richfield		59,000 acres; WildFire- Oldroyd
September 14, 2010		Westbound I-70 closed at U.S. 89 junction	Evacuation at Castle Rock campground, and residences along Clear Creek Road. Other road closures; Wildfire- Twitchell blaze

Source: History of Sevier County, Utah State Historical Society

Wildfire Assessment for Wayne County

Frequency	Occasional: History of damage every 10 years
Severity	High in the Urban-Wildland Interface.
Location	Annabella, Monroe, Joseph, Salina, Koosharem, Glenwood, Austin, Sevier, Burrville
Seasonal Pattern	Most wildfires affecting Sevier County occur during mid to late summer months (fire season).
Duration	The amount of time needed to contain a wildfire depends on a variety of uncontrollable variables such as: wind speed, relative humidity, type, and moisture content of fuel, weather, and topography. Thus containment time varies for each fire.
Speed of Onset	0 to 6 hours is the minimum amount of time given to homeowners in order to evacuate.
Probability of Future Occurrences	Occasional: 1 to 10 percent probability of occurrence in the next year or recurrence interval of 11 to 100 years.

Location and Extent

The Utah Division of Forestry and State Lands provided data for this report, based on an ongoing study of vulnerability in Central Utah. High Risk communities were noted as the following:

Annabella, Monroe, Joseph, Salina, Koosharem, Glenwood, Austin, Sevier, and Burrville.

Private communities/HOA's at risk include Accord Lakes, Fishlake Basic, Monroe Mountain, Pahvant, Salina Creek, Daniels, and Gooseberry.

The State of Utah Assessed Sevier County for Wildfire Hazard. They used BLM, US Department of the Interior geographic data. For more information consult the 2014 Approved Utah Hazard Mitigation Plan (SHMP). Hazard rankings are a combination of frequency and severity scores, both categorized 0-3. Population and growth is considered in these rankings.

The SHMP published that 702 square miles of Sevier is within Extreme Hazard of wildfire Vulnerability. Land in High Hazard of wildfire vulnerability make up 445.6 square miles of the County. Total there are 1,147.6 square miles of land in Sevier County that is at Extreme or High wildfire vulnerability.

In comparison to the other counties of Utah, Sevier County ranks 19th out of 29 in terms of overall vulnerability. The report also noted that there are 1,574 structures in areas of extreme of high hazard. Replacement costs of residential units and annual sales of commercial unites is at approximately \$121,072,899. This is a per capita loss of \$5,825.29. These numbers are given with a -59% change between 2004 and 2014 with population growth rate of 7.3 percent.

For a map showing areas at low to severe wildfire risk please see APPENDIX IX.

Sevier County Landslides

Landslides have not been a common problem in Sevier County. There are marks of landslides along the foothills of the west I-70 Corridor, particularly close to Elsinore and Richfield.

History of Landslides in Sevier County

Landslides or debris flows typically happen after large rain events in the county. They are often in conjunction with major flooding. There are no reported damage causing landslides in Sevier County. There are historically active landslides in the county, but they do not affect incorporated, residential, or roads.

Landslide Assessment for Sevier County

Table 6-8: Hazard Profile for Landslides in Sevier County	
Severity	Negligible
Location	Mass wasting in Sevier County is located predominately along the canyons east and west of the Sevier Valley (see map 3.1 on p.28 of this Annex).
Seasonal Pattern	Landslides most often occur within Sevier County during spring months with higher than normal amounts of precipitation.
Duration	Several months
Speed of Onset	No warning
Probability of Future Occurrence	Occasional: 1 to 10 percent probability of occurrence in the next year or recurrence interval of 11 to 100 years.

Location and Extent

About 687.4 square miles of the county are in areas of High or Moderate Landslide Susceptibility Areas, according to an analysis by the Utah Division of Emergency Management, with data provided by the Utah Geological Society. Most of these areas (about 437.7 square miles) are within moderate risk. There is estimated to be about 553 structures in these areas. The replacement cost of these residential units plus the annual sales of commercial units comes to be about \$53,171,309, an inflation adjusted value. This is a per capita loss of \$2,558.28. Overall Sevier County is ranked as 17th in terms of vulnerability out of the 18 counties assessed.

Six County AOG looked at where historically active landslides over-layered roads and found that Interstate I-70 had 8.6 miles in areas of historically active areas. SR 72 has about 4.7 miles of road through these areas, and SR 119 has about 2.2 miles. All other State Routes and Highways have under one mile in areas of historically active landslides.

The communities of **Joseph, Redmond, Monroe, and Central Valley** responded to a hazard assessment survey and all reported that they considered landslides to be no or little risk. The **Town of Glenwood** does consider a landslide hazard to be a risk to the spring that feeds the water supply. The Town considers this spring to be a critical facility. If a landslide event did occur, the source of water for the community would be blocked. This has not happened yet, and

the community considers it having a 1 to 10 percent probability of occurrence in the next year or recurrence interval of 11 to 100 years.

The 2010 landslide maps, published by the Utah Geological Society, shows that the hills directly west of **Richfield and Elsinore** have landslide scarps on the foothills. This is according to research done by the USGS. There are also historically active landslides in most of the mountainous area outside of the Sevier Valley. For more landslide susceptibility maps please see APPENDIX VII: LANDSLIDE SUSCEPTIBILITY MAPS.

Sevier County Earthquakes

Central Sevier Valley is one of the most seismically active parts of the Intermountain Seismic Belt (ISB). The ISB is a zone of earthquake activity extending from Northern Montana to northwestern Arizona

History of Earthquakes in Sevier County

Data is limited as written record was not maintained until the county was first colonized in 1865. In 1901 there was a 6 Magnitude quake. The primary effects of this quake was felt in a sparsely populated portion of the county and there was little damage. On September 29, 1921, Elsinore, Monroe, and Richfield experienced one of the worst earthquakes in the history of the State. The first shock was at a VIII or severe intensity (Mercalli intensity scale). Chimneys, and ceilings were damaged in the residences of Elsinore Town. The total estimated damage was \$100,000. There were two more strong tremors that caused further damage throughout Elsinore, and Monroe City Hall. Aftershocks continued into November (USGS- <http://earthquake.usgs.gov/earthquakes/states/utah/history.php>)

Somewhat more recently, on October 4, 1967, a VII or very strong intensity earthquake caused damage to the Marysvale area (Piute County). The Sevier communities of Koosharem, Joseph, and unincorporated communities of the southern part of the county experienced damage and rockslides due to the quake.

Sevier County experiences low to mild earthquakes every few years. There has been no reported damage from earthquakes since 1967. Although there has been four earthquakes of a 5.0-5.9 intensity between 1962 and 2001. Please see APPENDIX IV: EARTHQUAKE EPICENTERS for maps that track the epicenters of all earthquakes that occurred from 1962-2011.

Earthquake Assessment for Sevier County

Frequency	Possible
Severity	Catastrophic
Location	Ground shaking will be felt throughout the entire county if a large earthquake were to occur. Surface fault rupture could be expected in areas of known historic fault movements. Liquefaction is expected in areas of high to moderate liquefaction potential, which covers a vast portion of the Sevier Valley.
Seasonal Pattern	None
Duration	Actual ground shaking will be under one minute yet after shocks may occur for weeks after.
Speed of Onset	No warning

Location and Extent

Most earthquake faults in the county run within Sevier Valley or the I-70 corridor. The Sevier Valley fault runs from northern Arizona and ends in **Sigurd**. The central part of this fault (just south of Richfield) is the most active part. The western part of the valley has the Elsinore fault running through it. This fault runs from **Elsinore to Aurora**. These are considered large faults, and have a reasonable probability of producing earthquakes 6.0 to 6.5 magnitude. Since the Sevier fault is most active just **south of Richfield**, there is a reasonable probability of a 7.0 magnitude earthquake occurring (Liquefaction Potential Map for Central Utah, complete Technical Report, 1994).

In 2004 a report on geological hazards in **Monroe City** was published as a special study by the Utah Geological Survey. The study found that liquefaction, collapsible soils and radon are high risks in the event of an earthquake. More detail can be found in the study available online through the UGS. The community also had a major quake (6.5 Mag) in 1901. In 1921 several earthquakes in **Richfield and Elsinore** also caused considerable damage to the city.

The Sevier County Communities of **Glenwood, Joseph, Redmond, Central Valley, and Monroe** all noted that should a major earthquake occur there would be infrastructure and structural damage. **Redmond** could have up to one third of the town experience liquefaction. **Glenwood's** spring is at risk of source blockage from possible debris flow caused by an earthquake.

In 2009 the Utah Division of Emergency Services ran a scenario model for the Richfield segment of the Wasatch Fault, with a magnitude of 6.9. They used HAZUS software for this, which uses a standardized methodology that contains models for estimating potential losses from disaster. This was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. A ShakeMap of this scenario is provided at the end of the Earthquake Assessment Section.

The HAZUS scenario mentioned above showed that Sevier County would be most significantly affected out of the other ten counties which were part of the scenario. For a more detailed report with maps on damage, including number of persons injured, life threatening injuries, bridge damage, and cleanup requirements please see the full HAZUS report, which can be acquired through the Utah DEM.

Utah DEM performed an annualized loss analysis (AAL) which is “the expected value of loss in any one year, and is developed by aggregated the losses and their exceedance probabilities”. This report found a total loss of \$116,000 in building damage, \$342,000 in Non-Structural damage, and \$736,000 in total loss. This is a per capita loss of \$35.38 based off the 2010 Census. These numbers are based off of an average annualized loss analysis (AAL) which is “the expected value of loss in any one year, and is developed by aggregated the losses and their exceedance probabilities”. For more detail, please consult the State Hazard Mitigation Plan.

Sevier County Dam Failure

There are 25 active dams in Sevier County, as designated by the Utah Division of Water Rights. Most of these dams are detention ponds or livestock watering facilities. They generally pose a minimal threat to human safety or property, although may cause flooding in the case of failure.

Of the active dams, four are designated as a “low hazard” by the State of Utah Division of Water Rights. As defined by State Statute, low hazard dams are those dams which, if they fail, would cause minimal threat to human life, and economic losses would be minor or limited from damage sustained. These low ranked dams are: Denmark Wash, both dams on Johnson Livestock Oak Ranch, and the Salina City Dam.

Thirteen of the 25 dams are designated as “moderate hazard”. This designation indicates that if the dam were to fail, it would be a low probability of causing loss of human life, but would cause appreciable property damage, including damage to public facilities. Moderate Risk Dams are: Annabella, Big Lake, Deep Lake (Sevier), Farnsworth, Kings Meadow, Lost Creek, Magleby, Redmond, Rex, Rocky Ford, Sheep Valley, Skutumpah, and Willow Creek.

There are eight dams that are designated “high hazard”. If one of these dams fail there would be a high probability of loss of human life or extensive economic loss, including damage to critical public utilities. High risk dams are: Cottonwood Wash Detention Basin, Dairy Canyon Detention Basin, Forsyth Dam, Glenwood Debris Dam, Johnson Dam, Koosharem Dam, Sand H Debris Dam, and Three Creeks Dam.

Dam failure inundation maps and emergency action plans for each of the high risk dams can be found on the Utah Division of Water Right’s website at: <http://waterrights.utah.gov/cgi-bin/damview.exe?Startup>.

History of Dam Failure in Sevier County

There are no reported damage of past dam failure or damage in Sevier County.

Dam Failure Assessment for Sevier County

Frequency	Possible
Severity	Limited
Location	Would occur downhill from existing dams.
Seasonal Pattern	None
Duration	Depends on dam and type of break; Could be a wall of water which passes through in a few hours, or a slower break which could last for weeks.
Speed of Onset	6 to 12 hours.
Probability of Occurrence of large	Unlikely

Extent and Location

The State Hazard Mitigation Update (SHMP) produced by the Utah Division of Emergency Management (DEM) reported that for every designated high hazard dam in Sevier County there is about 2,598 people. There is a total potential of 80.9 square miles of inundation (flooding) in Sevier. This is about 4.2% of the county. It is estimated that Sevier County would have one of the highest per capita loss in the state—at \$10,796.48 per person. Overall it is estimated that there are 1,016 buildings in inundation areas. The estimated building value that could be exposed to inundation is \$224,580,338. Sevier County is ranked 6th out of the 29 counties assessed for Dam Failure Vulnerability. This score considers the extent of damage *if* it were to occur.

For inundation maps of all high risk dams please see APPENDIX X.

Cottonwood Wash Detention Basin

The Cottonwood Wash Detention Basin is located about half a mile outside of **Richfield City** at the northwest corner of the city. This just where I-70 passes the outer edge of city development, and so flooding would not affect this major artillery. The extent of this inundation flows through much of the north and middle part of the city and into the eastern agricultural fields.

Dairy Canyon Detention Basin

If the Dairy Canyon Detention Basin were to fail, inundation would cover the middle and southern part of **Richfield City**. There would also be flooding in much of the agricultural fields directly east of the city. The detention structure is located in Dairy Canyon, one mile southwest of Richfield.

Forsyth Dam

This dam is about 9 miles outside of Fremont (Wayne County). It creates the Forsyth Reservoir. It is located at the south eastern part of the county, along SR 72. Failure of this Dam would inundate the area around U M Creek. There would not be a huge impact to residences, as this area is sparsely populated. Although failure would affect critical facilities and water resources for area residences and potentially Wayne County.

Glenwood Debris Dam

This Dam is located one mile south east of **Glenwood Town**. If this dam failed, the whole town of Glenwood would be inundated as well as some of the agricultural land to the west.

Johnson Dam

The Johnson Dam is located at the end east end of the Johnson Valley Reservoir. This is north east of Fish Lake. Failure would inundated Frontage Road 036, the only paved road in this area.

Koosharem Dam

The Koosharem Dam is seven miles north of the **Town of Koosharem**. Failure would inundate to the east the agricultural areas that run north and south of the town. It would also pass through the agriculture south east of the unincorporated town of Greenwich.

Sand H Debris Dam

The Sand H Debris Dam is located three miles to the east of **Monroe City**. Inundation would travel north and cover the north eastern part of town and continue to flow into agricultural land to the east of the unincorporated community of Austin.

Three Creeks Dam

The Three Creeks Dam is located 12 miles northwest of the unincorporated community of Sevier. Failure of this Dam would inundate land along Clear Creek, and where it meets with the Sevier River. This would flood the portion of I-70 that travels through Clear Creek Canyon. A small portion of Highway 89 would also be flooded. The agricultural land south east of the unincorporated Town of Sevier may also experience some inundation.

APPENDIX I: CAPABILITIES OF COUNTY AGENCIES

A. Sevier County Emergency Management

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
 - a. Coordinate emergency planning and response activities with numerous county agencies. Planning encompasses preparedness, response, recovery, and mitigation.
 - b. Update and exercise emergency operations and mitigation plans.
 - c. Coordinate state sponsored training for county agencies including; law enforcement, public health, social services, fire departments, emergency medical services, etc.
 - d. Coordinate the county's Local Emergency Planning Committee. (meets quarterly)
 - e. Coordinate the county's Tier Two reporting. (hazardous materials)
 - f. Public awareness and educational programs via newspapers, radio, and schools to decrease vulnerability to hazards.
 - g. Work with schools and local businesses to help create site-specific hazard response plans and present in-service education to local business employees.
 - h. Responsible for timely and effective public information releases during emergency situations.
 - i. During a disaster declaration, emergency management has all county resources at their disposal including manpower, communications, and equipment.
 - j. Have verbal mutual aid agreements with Juab, Millard, Piute, Sanpete, and Wayne County Emergency Management Agencies for necessary resources during a disaster situation.
 - k. With effective planning, training, and exercising, emergency management can help to mitigate potential hazards within the county.
 - l. Assist in damage assessment and coordinate with state and federal agencies for recovery assistance.

2. Responsibility and authority in the regulating, inspecting, or funding of projects:
 - a. In coordination with the Six County Association of Governments, assist with applications for federal and state funding such as the Hazard Mitigation Grant Program.
 - b. Involved with inspecting hazardous material storage sites and fulfilling Tier Two reporting requirements.
 - c. Participate in dam inspections with the State Division of Water Resources.

3. Leadership and coordination with other government agencies:
 - a. Local Agencies: Sevier County Emergency Management coordinates with appropriate local agencies to ensure preparedness, response, recovery, and mitigation. These agencies include:

Sevier County Commissioners, Sevier County Road Department, Sevier County Sheriff's Department, various other law enforcement, fire, communication, and emergency medical agencies.
 - b. Non-local Agencies: Sevier County Emergency Management coordinates with numerous state and federal agencies. These agencies include the Utah Division of Emergency Services and Homeland Security, Utah Highway Patrol, State Health Department, Department of Transportation, and Federal Emergency Management Agency.

4. General recommendations/Emergency Management concerns:
 - a. Provide listings of eligible mitigation projects so counties can be prepared when funds become available.
 - b. Warning systems and sirens are outdated and inadequate. At this time, funding is not available for improvements.
 - c. Sevier County is constantly striving to improve planning and exercise activities and response capabilities. However, with the county growing and becoming more industrial, the threat of potential hazards increases, which increases the need for resources, training, and awareness.
 - d. County needs to add natural hazard mitigation to the General Plan and to the zoning and subdivision ordinances. Based on funding, Six County Planning Staff will work with the county to update the General Plan and the zoning ordinances to reflect natural hazard mitigation. Existing zoning requirements for flood plain management need to be enforced.

B. Sevier County Highway Department *

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions)
 - a. Design bridges, culverts, and overflow sections. The County Highway Department follows a very detailed list of design standards for all projects within the county.
 - b. Continually working with the Utah Department of Transportation (UDOT) on various projects since the UDOT dispenses federal funding. While the UDOT provides technical advice concerning guidelines and standards, they do not provide equipment, materials, or personnel.
2. Responsibility and authority in the regulating, inspecting or funding of projects:
 - a. Responsible for and have authority to regulate and inspect all projects completed within the county.
 - b. All projects funded by the state or federal government are designed by a consulting engineer and meet the usual acceptable federal standards. Inspection of federal aid projects is the responsibility of the consulting engineering company and is overseen by the county to ensure standards are met. Many county projects are designed with in-house expertise and engineers are consulted if problems arise.
 - c. All funding in one-way or another comes through the county, whether it is a certain percentage of the federal aid project or 100% of the county projects.
3. Leadership and coordination with other government agencies:
 - a. Local Agencies: The County Highway Department has little interaction with other county agencies concerning roads and bridges. They do, however, coordinate with various county agencies concerning right of way and right of way purchasing. The legal aspect of right of way purchasing is overseen by the States Attorney's Office. The land values are usually developed by the Tax Equalization Office and approved by the County Commission.
 - b. Non-local Agencies: The County Highway Department coordinates with various State and Federal agencies for technical assistance, permitting, environmental concerns, archeological sites, and cultural issues. These

agencies include the Utah Department of Transportation, US Fish and Wildlife, Corp of Engineers, and the Utah Historical Society.

4. General recommendations/Emergency Management concerns:
 - a. Sevier County Highway Department should assist local government with floodplain management and water development permitting.

C. Central Utah Public Health

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions)
 - a. Deal with bona fide health hazards using cause and effect in those areas for both mitigation and risk reduction. If it is a hazard affecting any number of persons and within the scope of public health, Central Utah Public Health (CUPH) will mitigate or exercise risk reduction through several methods ranging from enforcement of statutes to immunization programs.
 - b. Environmental Health has the knowledge and also access to the State Health Department for mitigation of incidents with hazardous or toxic wastes.
 - c. Programs include; waste water treatment, water pollution, public health nursing, immunization programs, solid waste regulation, food establishment inspections, air quality, and vector control.
2. Responsibility and authority in the regulating, inspecting or funding of projects.
 - a. CUPH Health is a unit of state government that operates through agreements or Memorandums of Understanding with the Utah Department of Health to enforce state public health statutes within the Six County district. Tax levies provide funding. There are no funding programs for non-operational programs.
3. Leadership and coordination with other government agencies:
 - a. Local Agencies: Within the scope of public health, CUPH coordinates with the following local agencies; Sevier County Emergency Management, local law enforcement agencies (city and county), local school boards, and planning and zoning agencies.

- b. Non-local Agencies: Within the scope of public health, CUPH coordinates with the following agencies; Utah Department of Health and state and federal law enforcement agencies.
- 4. General recommendations/Emergency Management concerns:
 - a. Public Health is normally under funded and understaffed at all levels of government. Should CUPH be called upon for expertise at a time of emergency or disaster, it normally does not have instrumentation for site level determinations of any kind without support from other agencies.
 - b. Public health agencies should be included in equipment storage; e.g., FEMA equipment "stored" and used at public health agencies, rather than being stored at a warehouse. For example, radio equipment that belongs to FEMA is based at county emergency management offices; the same could be done with air sampling equipment or other instruments/kits etc., which could be used by public health agencies both for daily work and at a time of emergency or disaster.

D. Sevier County Sheriff's Department

- 1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
 - a. Responsible for law enforcement and criminal investigation in unincorporated areas of the county and in smaller towns that do not have police departments.
 - b. Provide standard law enforcement manpower and equipment.
 - c. In disaster situations, provide; warning, rescue assistance, evacuation assistance, security, traffic control, and information assistance.
 - d. Provide public awareness and educational programs. (911 education, safe kids program, etc.)
 - e. Have mutual aid agreements with all surrounding counties and the Utah State Highway Patrol.
- 2. Responsibility and authority in the regulating, inspecting, or funding of projects:
 - a. None
- 3. Leadership and coordination with other government agencies:

- a. Local Agencies: Within the scope of law enforcement, the Sevier County Sheriff's Department coordinates with various local agencies. These agencies include Sevier County Emergency Management and various local police departments.
 - b. Non-local Agencies: Sevier County Sheriff's Department coordinates with appropriate state and federal agencies including; Utah Highway Patrol, Utah Attorney General's Office, Bureau of Criminal Identification, Utah Department of Transportation, and Federal Bureau of Investigation.
4. General recommendations/Emergency Management concerns:
- a. None

E. Koosharem, Monroe, Richfield, and Salina Fire Departments

- 1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
 - a. Respond to fires in order to protect lives, limit injuries, and minimize damage to property and the environment.
 - b. Respond to accidents in order to provide rescue assistance.
 - c. Assist Emergency Medical Services in providing emergency assistance to sick and injured. (first responders)
 - d. Provide standard firefighting manpower and equipment.
 - e. Respond to spills and releases of hazardous materials and assist in mitigating the detrimental human and environmental effects of these occurrences.
 - f. Respond to emergencies resulting from natural occurrences such as storms, floods, etc., and assist in mitigating the detrimental results of these occurrences.
 - g. Provide training for department members that will enable them to effectively and efficiently carry out their respective duties and responsibilities.
 - h. Develop and provide educational programs that promote the prevention of fires and encourage fire-safe and fire-smart activities.
 - i. Assist in enforcement of city fire ordinances.

- j. Fire investigation.
 - k. Provide assistance to other jurisdictions, as department resources and commitments allow. The State Division of Forestry and Fire Control have a contract to fight wild land fires in Sevier County.
 - l. Inspections and preplanning within the county to reduce hazards and aid in fire prevention.
 - m. Assist with the county's tier two reporting. (Hazardous materials storage sites)
 - n. In disaster situations, provide assistance in warning, rescue, evacuation, and situation updates.
2. Responsibility and authority in regulating, inspecting, or funding of projects:
 - a. None
 3. Leadership and coordination with other government agencies:
 - a. Local Agencies: In efforts to decrease vulnerability to hazards, the city fire departments coordinate with various local agencies. These agencies include Sevier County Emergency Management, Richfield City Police Department, Salina City Police Department, Sevier County Sheriff's Department, local Public Works, and local Emergency Medical Services.
 - b. Non-local Agencies: Utah State Fire Marshal and the Federal Emergency Management Agency.
 4. General recommendations/Emergency Management concerns:

Our district has seen an increase in the number and variety of calls. As first responders, we have to train and equip our fire departments for various situations that may arise, such as: vehicle extrication, various types of hazardous materials, and many other types of responses. Each added type of response increases the need for equipment and the time our volunteers need to spend in training

- a. Seek funding outside of the district for additional equipment that will improve the effectiveness of our responses as well as increase the margin of safety for our volunteers.
- b. Explore training options to cover the expanding variety of responses in our district.

- c. Look into recruitment and retention programs that will work in our district.

F. Utah State University Extension Service *

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
 - a. The Utah State University Extension Service provides practical, research-based information and educational programs to address critical issues facing individuals, families, agricultural producers, business operators, and communities.
 - b. County Extension Agents serve as subject-matter experts, educational planners, adult and youth teachers and community facilitators in several areas including agriculture and natural resources, horticulture, family and consumer sciences, 4-H and youth community development.
 - c. Provide planning, designing, implementing, and evaluating of educational programs for livestock and forage clientele.
 - d. Areas of responsibility include beef and dairy cattle, swine, other livestock, water quality, waste management, and forages.
 - e. Provide programming for county citizens in the areas of family financial management, environmental concerns, housing, health and wellness, aging, foods and nutrition, parenting, and human development.
 - f. Serve as an information resource in dealing with drought, winter storms, summer storms etc. in relation to agriculture, environment, water resources, etc.
 - g. Assist with damage assessment related to agriculture.
2. Responsibility and authority in regulating, inspecting, or funding of projects:
 - a. Authority is at federal level.
3. Leadership and coordination with other government agencies:
 - a. Local Agencies: Sevier County Emergency Management and Central Utah Public Health.

- b. Non-local Agencies: Utah State University, Utah State Health Department, United States Department of Agriculture, and Farm Service Agency.
4. General recommendations/Emergency Management concerns:
- a. None.

G. Richfield and Salina Police Departments

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions)
 - a. Provide general law enforcement services that are designed to efficiently prevent crime and promote concepts of community policing. These services include traffic control, 911 communications, criminal and accident investigations, neighborhood policing, animal control, and neighborhood and business watches.
 - b. Provide standard law enforcement manpower and equipment.
 - c. Provide public awareness and training programs including: Drug Abuse Resistance Education (DARE), juvenile diversion programs, Crime Stoppers, gang awareness, Citizen Police Academy, Jr. Police Academy, and a ride along program.
 - d. In disaster situations, provide: warning, rescue assistance, evacuation assistance, security, traffic control, and information assistance.
 - e. Involved in the county's Local Emergency Planning Committee (LEPC) and tier two reporting (Hazardous Materials).
2. Responsibility and authority in the regulating, inspecting, or funding of projects:
 - a. Provide input to and enforce city ordinances regarding public safety.
3. Leadership and coordination with other government agencies:
 - a. Local Agencies: Within the scope of law enforcement, the Richfield and Salina Police Departments coordinate with various local agencies. These agencies include: Sevier County Emergency Management, Sevier County Sheriff's Department, and the city fire departments.
 - b. Non-local Agencies: Richfield and Salina Police Departments coordinate with appropriate state and federal agencies including: Utah Highway

Patrol, Federal Bureau of Investigation (FBI), Bureau of Alcohol, Tobacco, and Firearms (ATF), and Federal Emergency Management Agency (FEMA).

4. General recommendations/Emergency Management concerns:
 - a. Explore funding alternatives to upgrade outdated and inadequate warning systems (sirens). At this time, federal funding is not available.
 - b. Intensify awareness and training in regard to civil disorder and terrorism incidents.

APPENDIX II: OTHER AGENCY RESOURCES

A. Mitigation and risk reduction:

1. Sevier County Social Services: Temporary assistance to needy families, food stamps, medically needy programs, adult services, homeless assistance, family planning, etc.
2. Army Corps of Engineers: Water and dam management within the county. Provide technical expertise, sandbags, and heavy equipment.
3. Utah Highway Patrol: Situation and damage assessment; provide transportation resources for movement of state personnel, supplies, and equipment to include air and ground reconnaissance; traffic control.
4. State Fire Marshal: Hazmat route utilization; HAZMAT technical assistance; situation and damage assessment.
5. Forestry, Fire & State Lands: Debris removal from recreational facilities; technical assistance; situation and damage assessment.
6. Utah Division of Wildlife Resources: Technical assistance; debris removal from recreational facilities; facility improvements; situation and damage assessment.
7. State Radio Communications: Exercise readiness of warning systems and communication support.
8. Department of Agriculture: Assists with situation and damage assessment; coordination with USDA; HAZMAT technical assistance; state land use program.
9. Department of Workforce Services: Situation assessment and administration of disaster unemployment assistance programs.
10. Human Services: Insure liaison with private relief agencies for disaster victims.
11. State Historical Society: Project screening and situation assessment.

Wayne County

Natural Hazard Assessment for Pre-Disaster Mitigation



Source: Base Map from AGRC Tile Service

Prepared by: Chelsea Bakaitis, Six County AOG Planning
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Contents

Introduction.....	4
Background Information.....	4
Capability Assessment.....	5
Wayne County Capabilities	5
Bicknell Town Capabilities.....	5
Capitol Reef National Park	5
Hanksville Town Capabilities.....	6
Loa Town Capabilities.....	6
Lyman Town Capability	6
Torrey Town Capabilities	6
Critical Facilities.....	7
Wayne County Flooding.....	9
History of Flooding in Wayne County	9
Flood Assessment for Wayne County.....	10
Location and Extent	11
Assessing Vulnerability: Addressing Repetitive Loss Properties.....	12
Wayne County Wildfires	13
History of Wildfires in Wayne County.....	13
Wildfire Assessment for Wayne County	13
Location and Extent	13
Wayne County Landslides	17
History of Landslides in Wayne County.....	17
Landslide Assessment for Wayne County	17
Location and Extent	17
Wayne County Earthquakes.....	19
History of Earthquakes in Wayne County	19
Earthquake Assessment for Wayne County.....	19
Location and Extent	19
Wayne County Dam Failure	20
History of Dam Failure in Wayne County.....	20
Dam Failure Assessment for Wayne County.....	20
Extent and Location	21
APPENDIX I: COUNTY CAPABILITIES.....	i
APPENDIX II: COMMUNITY CAPABILITIES	x
Torrey Town Capability Assessment.....	x
Loa Town Capability Assessment	xi
Bicknell Town Capability Assessment	xiii
Lyman Town Capability Assessment	xv
Hanksville Town Capability Assessment	xvii
APPENDIX III: OTHER AGENCY RESOURCES.....	xx
APPENDIX IV: 100-YEAR FLOODPLAIN MAPS	xxi
APPENDIX V- LANDSLIDE MAPS	xxvi
West Wayne County:	xxvii
East Wayne County:	xxviii
APPENDIX VI- MILL MEADOW INUNDATION MAP	xxix

APPENDIX VII: WILDFIRE RISK..... xxxi
APPENDIX VIII: QUARternary FAULTS xxxii

Introduction

This document is an overview of natural hazards in Wayne County. It tells about the history of hazards in the county and defines present and future projected risks. It serves as an annex of the general SCAOG Regional Pre-Disaster Mitigation Plan and is divided into sections covering the following hazard topics: flooding, wildfires, landslides, earthquakes, and dam failure. Each section contains information about the history of the hazard, and an assessment of the extent and location of the hazard. Wayne County Emergency Manager, Jeri Johnson was contacted for information about the county's hazard planning. All municipalities were contacted for information about hazards in their area.

Background Information

Agricultures is important to the economy and identity of Wayne County. Tourism has grown significantly since the establishment of Capitol Reef National Park in 1971. Transportation development had its beginnings in the original wagon trails, which brought the pioneers to this area. Later roads and SR 24 followed this east-west corridor. This corridor is where future development is likely to happen because much of the land along this artillery is private.

Approximately 65,051 acres or 4% of the total land area in Wayne County is privately held and outside the incorporated areas is mostly vacant. The other 96% is owned by the state or federal governments and aside from extractive industry is beyond the reach of development.

The vast majority of landslides, debris flows and wildfires occur on these public lands with virtually no impact on development. Of the privately held land, most is not developable due to a lack of water and county zoning requirements of water access and a minimum of five acres per house. Other limitations to development include steepness of the terrain, flash floodplains and accessibility. There is still plenty of infill within town limits that can be utilized for safe development without developing in unincorporated, sparsely populated, or hazardous areas.

Wayne County requires UBC on all new or proposed buildings. New subdivisions require a grading and drainage plan to mitigate any flooding, which may occur. Since most of the privately held land is along the relatively safe and accessible SR 24 (from Loa to Torrey and east of Capitol Reef National Park in Hanksville), development is occurring in this general area.

Figure 7-1: Participating Wayne County Jurisdictions

- Bicknell
- Capitol Reef National Park
- Hanksville
- Loa
- Lyman
- Torrey
- Wayne County

Capability Assessment

A capability assessment looks at “safeguards” that jurisdictions have in place to prevent or mitigate disasters. These measures include: planning and regulatory policies, administrative and technical roles, tax and funding resources, and educational/outreach programs. For more specifics about capabilities please see Appendices II and III on county and community capabilities.

Wayne County Capabilities

Wayne County has several different agencies which support mitigation actions. The Emergency Management of the county helps coordinate mitigation and risk reduction. This group also works with Six County AOG in the making of the mitigation plan. The County Highway Department also works to mitigate risk by making sure roadways are properly maintained with proper equipment to prevent flooding and overflow. Central Utah Public Health acts as a state agency but assists with preventing health hazards in the case of a disaster. The County Sheriff’s Department is responsible for law enforcement in unincorporated areas and smaller towns without departments. It works with the Wayne County Fire District in being a response to emergencies. Educational outreach is provided by the Utah State University Extension Service. It provides agricultural and environmental information in dealing with drought and winter storms. It coordinates with Wayne Emergency Management and Public Health. A more detailed list of agencies and their roles can be found in APPENDIX II- Capabilities of Counties.

Bicknell Town Capabilities

Although there are no planning documents for Bicknell (except through Six County AOG regional planning), the city has subdivision ordinances which are effective in reducing development in hazard prone areas. Even so, these ordinances are minimal and outdated. Gil Hunt, Mayor of Bicknell, noted that the ordinances could be expanded and updated, however there is so little growth that the code is currently not an issue. Bicknell is a small town and so has no staff that work with natural hazards or planning. They hire outside experts as needed, and can draw funding for hazard mitigation from taxes, utility fees, and federal and state funding. The town has a siren warning system for the community, but education and outreach is handled by the county.

Capitol Reef National Park

As a federal entity with full-time staff, the park is able to plan and educate for disaster. In planning and regulatory measures, the park indirectly addresses hazards in their Master Plan, but there is a Local Emergency Operations Plan, and Continuity of Operations Plan, and a Community Wildfire Protection Plan in place. They have mutual aid agreements with Wayne County and have maintenance programs “done in-house” to reduce risk. Their emergency management staff includes a chief building official, emergency manager, and a GIS coordinator. They are all trained on hazards and mitigation. The park has warning systems in place, but need to finalize the Structural Fire Fighting Agreement with Wayne County. Since they are a federal entity the diversity of their funding sources for hazard mitigation is limited to capital improvements project funding, utility fees, and appropriated funds from Congress. There are ongoing public information for visitors dealing with safety, water use, fire danger, and flood preparedness.

Hanksville Town Capabilities

Although the town of Hanksville does not have any other plans in place, their Capital Improvements plan addresses hazards, and identify projects that can be included in the mitigation strategy. The town also has zoning ordinances in place that effectively reduce hazard impacts. There is also a siren warning system in place. Although they cannot levy taxes for hazard mitigation, they can draw money from impact fees and CIB for mitigation projects. The town works with Wayne County to provide EMS and police services. The EMS providers and the local town council also provide education and outreach to the community about emergency preparedness.

Loa Town Capabilities

Hazards are addressed in Loa Town's Emergency Operations plan and Storm water Management plan, although they do not address mitigation projects. Their master plan and capital improvement plan does not address hazards. Even so, the code has a natural hazard specific ordinance which addresses storm water, and that regular maintenance is done in the city to prevent hazardous conditions. The city has a warning siren located at the firehouse. There are several places which the community is able to draw funding from for hazard mitigation including taxes, impact fees, and federal and state grants. There are currently no education or outreach programs in Loa Town.

Lyman Town Capability

Although the master plan is not complete for Lyman town, they have a local emergency operations plan. Lyman uses primarily county resources for emergency planning. They cannot draw money from taxes, utility or impact fees for hazard mitigation but rely on state and federal funding instead. They town has no local warning systems or sirens in place. They do have ongoing education and outreach for the community provided by the local churches and county.

Torrey Town Capabilities

Torrey has subdivision ordinances to prevent housing to be built in hazard prone areas, such as areas with frequent flooding. The town uses county resources for emergency management and education, although it does have its own warning siren system. Pat Kearney, City Council Member, noted that it would be helpful if there was an agreement between the towns of Wayne County to implement certain projects that would have cross-jurisdictional affects.

Critical Facilities

Critical facilities are given special consideration when planning mitigation projects: They are the activities and facilities that even a slight chance of a hazard is a great threat. Critical facilities include hospitals, fire stations, police stations, critical records, water treatment, and other similar facilities.

Wayne County and the municipalities were asked to list their critical facilities and define what natural hazards pose the greatest risk to each facility. The following charts outline information given by the municipalities of their critical facilities and what natural hazards posed the greatest threat to these facilities.

Table 7-2: Wayne County Critical Facilities		
Critical Facilities	Greatest Risk	History of Damage to Critical Facilities
Bicknell Town Critical Facilities		
<ul style="list-style-type: none"> - Medical Clinic - Water storage tank - Water pump & chlorination facilities - Fire station - Town Hall 	- Flooding	<ul style="list-style-type: none"> - July 19th 2004 flash flooding caused the town council to declare a “state of emergency” because of the damage caused to agriculture, aquaculture, businesses, streets, property, water systems, etc. - Spring of 2011 flooding of the Fremont River caused silting up of the Brinkerhoff Spring Facility, one of the town’s culinary water sources. This required emergency action through the Utah Division of Drinking Water and issuing bonds to repair the damages.
Hanksville Town Critical Facilities		
<ul style="list-style-type: none"> - Water treatment facility storage tanks, water wells and ump house - Hanksville Community Center (houses Wayne Community Medical Clinic branch and Critical records) - Hanksville EMS building - Wastewater lagoons 	Flood	
Loa Town Critical Facilities		
<ul style="list-style-type: none"> - Fire Station - Town Hall - Town Shed 	Fire, Flood	No
Lyman Town Critical Facilities		
<ul style="list-style-type: none"> - Town Hall - Fire Station - Cemetery storage building - Town Pavilion 	Fire, earthquake, flood, wind	No
Torrey Town Critical Facilities		

<ul style="list-style-type: none"> - Water tanks, storage, delivery system - open canal - chlorination plant - Bridge across sand creek - Fire station 	<p>open canal: flooding potential; breach with rain</p> <p>general: Wind and water events</p>	<ul style="list-style-type: none"> - Sand creek bridge- sand creek floods almost annually, bridge has been impacted numerous times, and even has washed completely away. County maintains bridge and road. Residents are isolated when this happens. - SR closure from falling trees - Tree across canal (Beaver Damage)- canal backed up and almost overflowed
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Capitol Reef National Park Critical Facilities

<ul style="list-style-type: none"> - Water treatment facility - visitor center and superintendent's office (critical records) - ranger office (records) - administrative building (records and IT infrastructure) 	<ul style="list-style-type: none"> - Fire (structural) - Flood - Earthquakes (rock fall, landslide) 	<p>No</p>
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Wayne County Flooding

Wayne County has recently experienced impacts related to flooding. The Fremont River travels through the county; most flooding occurs along this river and its tributaries. This includes Sand Creek, Spring Creek, and ponds off of the river that hold culinary water for the communities. Flash-flooding from snowmelt is also a concern for communities, as most are located on deltas at the mouth of canyons. All incorporated communities noted that flooding was a concern for their communities. Most developed unincorporated areas are also at risk of flooding.

History of Flooding in Wayne County

In terms of property damage and disruption of community life, the towns along the Fremont River have been most impacted by flooding. The original settlements of Giles and Fruita were abandoned (1910 and 1955 respectively) after disaster from flooding by the Fremont River. This river has flooded the towns of Bicknell, Loa, Lyman, Hanksville, and various developed unincorporated areas. Bicknell declared a “State of Emergency” in 2004 because flash flooding caused damage to various facilities and infrastructure. In 2011 overflow from the river silted up the Brinkerhoff Spring, one of Bicknell’s water sources. The unincorporated community of Sand Creek outside of Torrey, experiences annual floods or even washout over the bridge connecting their community to the main road. Hanksville agriculture production was impacted for two years after flooding in 2006 caused the Fremont River to overflow and wash out a dam. In 2013 another dam impacting Hanksville was damaged from flooding.

According to 2013 SHELUS data, between the years of 1980-2012 there has been in Wayne County a total property loss of \$9,555,582 and in crop damage, \$10,954 was lost. That is a total (based on current population) per capita loss of \$3,483. Washington County which ranked first in total loss only had a per capita loss of \$2,813, and Salt Lake County, ranking second in total loss, had a per capita loss of \$50. Wayne County is remote and only has maintained a low population. The County receives less overall federal funding to deal with infrastructure projects to mitigate flood disaster. The monetary cost to the public due to flooding in Wayne County makes this a significant hazard. The 2014 State of Utah hazard assessment put out by the DEM designates Wayne County as a low flood hazard zone, based off of the former local hazard mitigation plan. This 2015 update to the Wayne County Assessments recommends that flooding be considered a more critical concern for Wayne County based on historic costs per citizen and the future threat of flooding, which will be addressed in the next section.

Date	Location	Critical Facility or Area Impacted	Comments
August 4, 1957	Caineville	Destroyed bridge west of town blocked SR 24	Source Fremont River
August 25, 1961	Torrey	SR 24 damaged	Source South Desert Wash
July 31, 1965	Bicknell/Lyman/ Teasdale/ Loa	Damage to homes, crops, ranches, and SR 24 and 117	Heavy rains flooded area creeks.
August	Bicknell	Farmland, crops, orchards,	10,000 acres of farmland

18, 1965		and SR 68 all damaged	destroyed.
July 19, 2004	Bicknell	Agriculture, aquaculture, businesses, streets, property, water systems	Flash flooding, town council declared "State of Emergency"
Fall 2006	Hanksville	Dam washed out, not repaired for 2 years affecting farming	Heavy rains; flooded Fremont river
Spring 2011	Lyman	Estimated cost: \$30,000	Canal breach
Spring 2011	Bicknell	Silting of Brinkerhoff Pond facility, one of the town's culinary water sources.	From Fremont River, emergency action through the Utah Division of Drinking Water, and the issuing of bonds to repair the damage
Fall 2013	Hanksville	Damage to new dam/ water diversion site	Heavy rains
2014	Grover (unincorp)	Grover Road (Rt. 12)	Road washout
Annual	Sand Creek (outside of Torrey)	Bridge, isolates residents of the Sand Creek unincorporated community	Annual flooding, and sometimes complete washout of bridge. County maintains bridge and road.

Sources: Flood Hazard Identification Study of SCAOG, by USACE, Utah Division of Emergency Services and Homeland Security, August 2003; Correspondence with communities and county.

Flood Assessment for Wayne County

Frequency	Likely	
Severity	Limited	
Location	Flooding would occur in and along floodplains.	
Seasonal Pattern	Wayne County's main flooding threat is from snowmelt runoff during spring months and the Fremont River.	
Duration	The type of event determines the duration of flooding; flooding due to summer thunderstorms can last a couple of hours. Flooding due to spring runoff can last weeks.	
Speed of Onset	Six to twelve hours.	
Probability of Future Occurrences*	Wayne County unincorporated	Highly likely
	Bicknell Town	Likely
	Hanksville Town	Highly likely
	Loa Town	Occasional
	Lyman Town	Likely
	Torrey	Likely
	Capitol Reef National Park	Likely

Source: Based on assessment created by jurisdiction.

**Unlikely*: Less than 1 percent probability of occurrence in the next year or a recurrence interval of greater than every 100

years.

Occasional: 1 to 10 percent probability of occurrence in the next year or recurrence interval of 11 to 100 years.

Likely: 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years.

Highly Likely: 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years.

Location and Extent

As a whole, Wayne County has limited flood threat, although this hazard affects residences and agricultural production almost every year. The municipalities of Bicknell and Torrey participate in the National Flood Insurance Program (NFIP). Loa, Lyman, and Hanksville do not participate. Even so, significant flooding has occurred in the past and will occur in the future. The question is when, where and to what extent?

There has been no Flood Insurance Studies done for any of the communities, even those participating in the NFIP. Even so, there are Flood Insurance Rate Maps (FIRM) for Torrey and Loa Towns. They have not been updated since the 1970's. These maps can be found on the website of FEMA through the Flood Map Center.

An August 2003 report titled Flood Hazard Mitigation Study of the Six County Association of Governments by the U.S. Army Corps of Engineers was completed to help communities without floodplain data. This study generally identified areas of concern for municipalities and county. However, this report only intended to give communities very general estimates of where flood risk may exist.

The USACE study noted that the majority of the population in Wayne County lives within a few miles of the Fremont River and within the 100-year floodplain. The **unincorporated portions of Wayne County** have areas of flood-prone development, and almost 40 percent of the county's population is in this area. Flooding has occurred in the spring, summer, and fall in the past ten years as a result of rapid snow melt and severe rainstorms. Given existing and potential future development, **areas around Sand Creek and the Fremont River** are most likely to see impacts related to flooding. At present most of the risk for flood damage is centered on potential agriculture and rangeland losses, although homes in these areas have been damaged as well. If future development is not properly managed, threats to structures and human safety will certainly increase.

Floodplain maps were created by the Utah Division of Emergency Services. They used HAZUS, a loss estimation program, to create a 100-year floodplain computer simulated scenario. This means that it looked at the flooding impact with a 1% chance of flooding in any given year. These floodplain zones could pose a potential risk to residents and their property, and included in this analysis. For maps of these floodplains created by the state please see APPENDIX IV- 100 Year Floodplain Maps.

The HAZUS scenario found that 19 buildings could be damaged in the event of a 100-year flood. The total building cost damage would be \$2,037. Building exposure damage would be a \$151,962 cost. Based on the HAZUS assessment Wayne County was found to have a high vulnerability. This means that in the case of a 100-year flood the county would experience high loss.

There have been two major floods in recent history in **Bicknell Town**. Including a flash flood in 2004 that put the town into a declared “State of Emergency”. Representatives of the town see flooding as the greatest hazard threat to their critical facilities. They rated the probability of a flood happening as having a 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years. If a large flood occurred the town estimates that all of the jurisdiction would be affected by erosion, road damage and crop damage. The town participates in the NFIP.

Hanksville has major threat of flooding from Bull Creek, especially on the east side of town (USACE, 2003). Floods are common in Hanksville, but the town does not participate in NFIP. In the January 2015 assessment created by town officials, flooding was rated as highly likely (90 to 100 percent probability of occurrence in the next year or a recurrence interval of less than 1 year) and in the case of an event was projected to affect the entire jurisdiction. In 2006 and 2013 Hanksville had two major floods, and both occurred because of dam failure, which will be addressed later in this document. These flood events were estimated to have cost about \$12 million total in repairs. According to the State HAZUS 100-year floodplain assessment Hanksville would receive the worst flooding impact. For a map of flooding please see APPENDIX IV: 100-YEAR FLOODPLAIN MAPS.

Although the town of **Loa** has an occasional chance of being flooding in the future (1 to 10 percent probability of occurrence in the next year or recurrence interval of 11 to 100 years), the event of a flood would have a high impact on the community. The town is not a part of the NFIP.

Lyman has threat of flooding from unnamed drainages to the east (USACE, 2003). Town officials rated their probability of having another flood as likely, with high impact to the city. Flooding is common in Lyman, although it does not often cause a large extent of damage. Even so, in 2011 the town experienced flooding from a canal breach. The cost of damages was estimated at \$30,000. The town does not participate in NFIP.

The unincorporated areas outside of **Torrey Town** have a much higher flood threat, than the actual jurisdiction. Even so, the town listed flooding as a threat to critical facilities. Overall Torrey has a likely chance of flooding every few years, although the extent of the damage might be minor.

Assessing Vulnerability: Addressing Repetitive Loss Properties

There are no repetitive loss properties in Wayne County (FEMA, 2014).

Wayne County Wildfires

Most of the wildfires occurrences in Wayne County pose little threat to life and property. Wayne is part of the Colorado Plateau. This semi-arid climate makes the area vulnerable to wildfire. Most of the population of Wayne County is in the agricultural valleys of the western part of the county along SR 24. The eastern part of the county is largely uninhabited.

History of Wildfires in Wayne County

Seventy-three fire starts were reported in Wayne County between 1973 and 2005. The majority of wildfires were located along the rim of the Aquarius Plateau, near the communities of Torrey, Teasdale, and Grover (Central Utah Wildfire Protection Plan).

Wildfire Assessment for Wayne County

Frequency	Occasional: 1 to 10 percent probability of occurrence in the next year or a recurrence interval of greater than every 100 years.
Severity	Negligible (10-25% of jurisdiction affected)
Location	Typically occur at the valley's boundary with the foothills.
Seasonal Pattern	Most wildfires affecting Wayne County occur during mid to late summer months (fire season).
Duration	The amount of time needed to contain a wildfire depends on a variety of uncontrollable variables such as: wind speed, relative humidity, type, and moisture content of fuel, weather, and topography. Thus containment time varies for each fire.
Speed of Onset	6 to 12 hours is the minimum amount of time given to homeowners in order to evacuate.

Location and Extent

Wayne County is ranked by the Utah Division of Emergency Management as least vulnerable to wildfires out of all counties in the state. Even so, there are several inhabited areas that have recently been ranked by the Utah Division of Forestry and State lands (UDFSL) as being close to extreme risk (See table 7-6). In interviews with the communities, officials ranked their probability of wildfire as unlikely—they saw it as an uncommon hazard but noted that the impact would be high.

A list of Regional Recommendations and Priorities may be found in the Central Utah Regional Wildfire Protection Plan (CWPP), May 4, 2007. The Utah Division of Forestry, Fire, and State Lands is also putting together forthcoming a wildfire assessment for the Six County Region. More information can also be found in the Utah Division of Emergency Management Emergency State Hazard Mitigation Plan 2014 update.

Watersheds and recreational resources were listed as risk in the CWPP. It included that the EPA in 2006 found nine watersheds in Wayne County that would be affected by wildfire. Extreme and High Hazard Wildfire Areas make up approximately 1,588 square miles in the county.

There are about six people per acre in extreme high and wildfire risk areas in Wayne County. There are seven out of the nine assessed communities by the Utah Division of Forestry and State Lands as being in a wildland urban interface (WUI) (See Table 7-7). This designation refers to the zone of transition between urban areas (where there is a concentration of people living) and wildland. Communities that are within 0.5 miles of this zone are included. These areas are at risk of wildfires.

According to the 2014 State Hazard Assessment Update, Wayne County has a total of 12 state facilities in Wildfire Risk Areas. In fact these are all in high or extreme wildfire risk areas. The loss of these facilities would be \$1,301 per capita. The insured value of these state facilities is \$3,561,856.

Torrey Town was ranked in an analysis by the UDFSL as being a community at risk, or CAR (See Table 7-6). An ongoing/forthcoming assessment confirms this ranking and includes Torrey as a wildland urban interface community (See Table 7-7). They rank it third out of the nine Wayne County communities within high risk areas. The recent assessment also notes that the town's watershed is within this risk zone. Another critical facility at risk is the town's power generation station south of the jurisdiction.

The nearby unincorporated communities of **Teasdale and Grover** are ranked second for high risk in the county by the UDFSL. They are also wildland urban interface communities. Teasdale has a watershed in a high wildfire risk zone.

Bicknell Town also has a watershed at risk from wildfire. The community was ranked overall fifth as a high risk wildfire community.

Lyman is also a high risk wildfire risk community and is ranked as fourth out of the nine assessed communities. Like Bicknell, it has a watershed at risk from wildfire, although it is not in the wildland urban interface.

Loa is identified as a CAR, but out of the assessed communities it is ranked the least vulnerable. The unincorporated community of **Fremont** comparatively has a low vulnerability, although it is in a high risk area.

Hanksville has a watershed in the high wildfire high risk areas, although it overall does not have a high vulnerability to wildfire.

Other not previously mentioned CARs include the **Blackridge Interface, and Happy Valley, Lyman Horse Valley**. Although it should be noted that these areas have few inhabitants. The UDFSL also consider **Thousand Lakes, and the Fishlake Basin** to be in a high risk area in their 2015 ongoing assessment. The **Thousand Lakes** area has a watershed within this zone and is ranked the *most* vulnerable out of all assessed areas.

A look at the wildfire risk maps show that **SR 12** has about 12.4 miles of road within an area of extreme, high, or moderate risk. **SR 24**, the most used road in the county has about 13.7 miles within this zone. **SR 72** has only about 1.2 miles of road through this wildfire risk zone.

Capitol Reef National Park regards wildfire as likely, and has had to evacuate the park because of wildfire risk in the past. The park and surrounding land has historically significant structures and offers a variety of recreational activities. A main industry of this region of the county is tourism, and would be affected by a significant wildfire.

For a map of Wayne County Wildfire Risk, created by Wayne County GIS Department, please consult Appendix VII.

Table 7-6: 2013 Communities at Wildfire Risk						
Community name	Fire Occurrence	Fuels hazard	Values Protected	Fire Protection Capability	Overall Score*	Notes
Bicknell	2	3	3	3	11	Watershed at risk
Black Ridge Interface	2	3	3	3	11	
Fremont	2	3	3	3	11	Watershed at Risk
Grover	2	3	3	3	11	Watershed at Risk
Happy Valley	2	3	3	3	11	
Loa	2	3	3	3	11	Watershed at Risk
Lyman	2	3	3	3	11	Watershed at Risk
Lyman/Horse Valley	2	3	2	3	10	
Notum	2	3	3	3	11	
Teasdale	2	3	3	3	11	Watershed at Risk
Torrey	2	3	3	3	11	Watershed at Risk
Source: (Utah Division of Forestry, Fire, and State Lands 2013) http://www.ffsl.utah.gov/images/Fire/wui/2013CARsFinalList.pdf *These scales ranges from 1 (least) to 3 (most). **The Overall Score ranges from 0 (No Risk) to 12 (Extreme Risk).						

Table 7-7: Wayne County High Risk Wildfire Areas

TOWN	WATERSHED	WUI	FUELS	TREATMENT AREA	SAGE GROUSE	TOTAL	RANKING
LOA						0	#9
TORREY	X	X		X		3	#3
TEASDALE *	X	X	X	X		4	#2
LYMAN	X					1	#4
BICKNELL	X					1	#5
GROVER *		X	X	X		3	#2
FREMONT	X					1	#8
HANKSVILLE	X					1	#6
FISHLAKE BASIN						0	#7
THOUSAND LAKES	X	X	X	X		4	#1

*Has been grouped with another town in the Ranking Section

Source: Utah Division of Forestry, Fire, and State Lands, Forthcoming Wildfire Risk Assessment 2015

Wayne County Landslides

Landslides have not been a common problem in Wayne County. Although SR 24, the main road through the county, has had debris flow. The eastern mountains, hugging the towns of Bicknell and Lyman also commonly experience landslides. Many residents live in unincorporated areas of Wayne County in the mountains or hills surrounding incorporated communities. These areas are at the most risk.

History of Landslides in Wayne County

The map below is a snapshot of a larger map of the county published by the Utah Geological Survey in 2010 (See Appendix V-Landslide Maps for full map). This map demonstrates areas where landslides have occurred in the county. Bicknell has had landslides along its eastern border. SR 24, just south of Bicknell has also experienced landslides.

Landslide Assessment for Wayne County

Table 7-9: Hazard Profile for Landslides in Wayne County		
Severity	Negligible	
Location	Mass wasting in Wayne County is located predominately along the Canyons surrounding Rabbit Valley. Not usually affecting jurisdictions or unincorporated residences.	
Seasonal Pattern	Landslides most often occur within Wayne County during spring months with higher than normal amounts of precipitation.	
Duration	Several months	
Speed of Onset	No warning	
Probability of Occurrence*	Bicknell Town	Occasional
	Capitol Reef	Likely
	Hanksville	Unlikely
	Loa	Unlikely
	Lyman	Unlikely
	Torrey	Unlikely
Source: Based on assessment created by jurisdiction, and Utah Geological Survey Data		
*Unlikely: Less than 1 percent probability of occurrence in the next year or a recurrence interval of greater than every 100 years.		
Occasional: 1 to 10 percent probability of occurrence in the next year or recurrence interval of 11 to 100 years.		
Likely: 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years.		
Highly Likely: 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years.		

Location and Extent

Approximately 785.4 square miles of the county is within areas of high or moderate landslide susceptibility areas, according to the Division of Emergency Management Statewide Natural Hazard Risk Assessment. That being said, only 48.7 of these square miles are in high hazard areas. It is estimated that out of the structures that are in landslide zones, there could potentially be a per-capita loss of \$497.67. There are no state owned facilities in landslide areas. Overall Wayne County is ranked as least vulnerable to landslides out of all the assessed counties.

SR 12 is has about five miles that are in a landslide risk zone near the unincorporated area of Grover. **SR 24**, the main road of the county has only about 33.8 feet of area within a landslide risk zone. **SR 72** has about 1.4 miles of area within a landslide risk area. There are no railroads in Wayne County.

Although all of the communities of Wayne County consider landslides to be a rare and unlikely occurrence, there are landslide zones surrounding the main corridor of development. **Loa** has a power generation station that is within a landslide risk area on the western side of the town (outside jurisdiction in county land). The eastern edge of **Bicknell** has experienced landslides in the past. The town is up against a set of foothills that are in a landslide zone. The north-eastern part of **Lyman** is in a landslide risk zone. There is a housing development along Foothill Drive and Old Bob's Lane that is in this area. There has been landslides in this area in the past, although in there have been none in recent record.

Wayne County Earthquakes

History of Earthquakes in Wayne County

There are no history of damage causing earthquakes in Wayne County.

Earthquake Assessment for Wayne County

Table 7-10: Hazard Profile for Earthquake in Wayne County

Frequency/Probability of Occurrence	Unlikely: Less than 1 percent probability of occurrence in the next year or a recurrence interval of greater than every 100 years.
Severity	Low
Location	Ground shaking will be felt throughout the western half of the county if a large earthquake were to occur.
Seasonal Pattern	None
Duration	Actual ground shaking will be under one minute yet aftershocks may occur for weeks after.
Speed of Onset	No warning

Location and Extent

In 2009 the Utah Division of Emergency Management ran a scenario model for the Richfield earthquake segment with magnitude of 6.9. They used HAZUS software for this, which uses a standardized methodology that contains models for estimating potential losses from disaster. It was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences.

According to Utah DEM HAZUS analysis, Wayne County would be impacted by an earthquake in Richfield. Although the extent of this damage would be minimal. In the case of an earthquake with a 6.5 Magnitude, it is estimated that there would be no casualties. Direct economic losses for buildings in Wayne were expected to be \$3,000. And non-structural damage was estimated to be at \$9,000, for a total loss of \$11,000. This is a per capita loss of \$7.20.

For a map of quaternary faults please see APPENDIX VIII.

Wayne County Dam Failure

There are five active dams located in Wayne County, as designated by the Utah Division of Water Rights (UDWR). Most of these dams are detention ponds or livestock watering facilities. Most pose a minimal threat to human safety or property, although may cause flooding in the case of failure.

Of the five active dams, one is designated as a “low hazard” by the UDWR. As defined by state statute, low hazard dams are those dams which, if they fail, would cause minimal threat to human life, and economic losses would be minor or limited from damage sustained. This low ranked dam is Tidwell Dam.

Three dams (Road Creek, and the two Teasdale Dams) have been designated as “moderate hazard”. Moderate hazard dams which, if they fail, have a low probability of causing loss of human life, but would cause appreciable property damage including damage to public utilities.

There is one dam, Mill Meadow that is considered a “high hazard” in the county. This means that if they fail, have a high probability of causing loss of human life or extensive economic loss, including damage to critical public utilities.

Dam failure inundation maps and emergency action plans for each of the high risk dams can be found on the UDWR’s website at: <http://waterrights.utah.gov/cgi-bin/damview.exe?Startup>.

History of Dam Failure in Wayne County

In 2006 the Hanksville Dam washed out and flooded the Fremont River. It washed away a part of the old no longer used bridge portion of SR 24 that crossed the Fremont River. The Hanksville Canal Company moved the dam about half a mile upstream two years later. Before this new dam was built crop production decreased because there was less irrigation. In 2013 heavy rains damaged the second Hanksville Dam, but repairs were immediately made by the canal company. This dam is not listed by the Utah Division of Water Rights.

Dam Failure Assessment for Wayne County

Frequency	Possible
Severity	Limited
Location	Would occur downhill from existing dams.
Seasonal Pattern	None
Duration	Depends on dam and type of break; Could be a wall of water which passes through in a few hours, or a slower break which could last for weeks.
Speed of Onset	6 to 12 hours.

Probability of Occurrence	Unlikely for general county Occasional for Hanksville and Loa Town
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Extent and Location

Mill Meadow Dam

The Mill Meadow Dam is located in the north end of the county close to ST 24, north of the community of Fremont. It has a high hazard rating. The inundation affects the communities in Rabbit Valley, as it follows the Fremont River. As the inundation tapers off it will go through Capitol Reef and end near Fruita. Within the Jurisdictional boundaries of Loa, Lyman, and Bicknell there is little if no damage. However the outlying agriculture will be flooded. For a map of the inundation area see map in APPENDIX VI- MILL MEADOW INUNDATION MAP.

The Utah Department of Public Safety/Division of Emergency Management ran a HAZUS analysis for possible flooding caused by this dam’s failure. It was reported that seven square miles, or 0.3% of the county is in a high risk inundation zone. This does not mean that the dam is necessarily likely to break, just that if it did the extent of damage would be high. There is an estimated of four buildings in this area, with an estimated building value hazard exposure of \$618,957. This is about \$222.81 per capita.

Hanksville Dam

Originally the Hanksville Dam was built by the Hanksville Canal Company, a private organization. It is located just west of Hanksville Town on the Fremont River. This dam funnels water from the Fremont River into the Hanksville Canal Company irrigation canal providing the only source of irrigation for all farmers, gardens and such for the community of Hanksville (Correspondence with Lisa Wells, Town Clerk). Past dam failure has caused economic loss in crop production, and future dam failure will again.

Road Creek Dam

The Road Creek Dam has a moderate hazard rating. This means that there is a low probability of causing loss of human life, but would cause appreciable property damage including damage to public utilities. This dam controls Road Creek, which comes down the southwest foothills outside of Loa. This area is primarily agricultural production, and breakage of this dam would cause the most damage to crop production.

Teasdale Dams

The Teasdale Dams both also have a moderate hazard rating. Located next to each other, they retain water from Birch Creek to provide irrigation to the agricultural areas of Teasdale. If these dams failed they would probably flood property in the southern area along SR 12 in this unincorporated community.

APPENDIX I: COUNTY CAPABILITIES

A. Wayne County Emergency Management

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
 - a. Coordinate emergency planning and response activities with numerous county agencies. Planning encompasses preparedness, response, recovery, and mitigation.
 - b. Responsible for everyday operations of the county's Emergency Operations Center.
 - c. Update and exercise emergency operations and mitigation plans.
 - d. Coordinate state sponsored training for county agencies including; law enforcement, public health, social services, fire departments, emergency medical services, etc.
 - e. Coordinate the county's Local Emergency Planning Committee. (meets quarterly)
 - f. Coordinate the county's Tier Two reporting. (hazardous materials)
 - g. Public awareness and educational programs via newspapers, radio, and schools to decrease vulnerability to hazards.
 - h. Work with schools and local businesses to help create site-specific hazard response plans and present in-service education to local business employees.
 - i. Responsible for timely and effective public information releases during emergency situations.
 - j. During a disaster declaration, emergency management has all county resources at their disposal including manpower, communications, and equipment.
 - k. Have verbal mutual aid agreements with Millard, Piute, Sanpete, Sevier, and Wayne County Emergency Management Agencies for necessary resources during a disaster situation.
 - l. With effective planning, training, and exercising, emergency management can help to mitigate potential hazards within the county.

- m. Assist in damage assessment and coordinate with state and federal agencies for recovery assistance.
2. Responsibility and authority in the regulating, inspecting, or funding of projects:
 - a. In coordination with the Six County Association of Governments, assist with applications for federal and state funding such as the Hazard Mitigation Grant Program.
 - b. Involved with inspecting hazardous material storage sites and fulfilling Tier Two reporting requirements.
 - c. Participate in dam inspections with the Army Corp of Engineers.
 3. Leadership and coordination with other government agencies:
 - a. Local Agencies: Wayne County Emergency Management coordinates with appropriate local agencies to ensure preparedness, response, recovery, and mitigation. These agencies include:

Wayne County Commissioners, Wayne County Road Department, Wayne County Sheriff Department, various other law enforcement, fire, communication, and emergency medical agencies.
 - b. Non-local Agencies: Wayne County Emergency Management coordinates with numerous state and federal agencies. These agencies include the Utah Division of Emergency Services and Homeland Security, Utah SR Patrol, State Health Department, Department of Transportation, and Federal Emergency Management Agency.
 4. General recommendations/Emergency Management concerns:
 - a. Provide listings of eligible mitigation projects so counties can be prepared when funds become available.
 - b. Warning systems and sirens are outdated and inadequate. At this time, funding is not available for improvements.
 - c. County needs to add natural hazard mitigation to the General Plan and to the zoning and subdivision ordinances. Existing zoning requirements for floodplain management need to be enforced.
 - d. The existing addressing system is outdated and confusing for emergency responders and needs to be unified, revised and clarified, including the

installation of appropriate signage. Outside as well as local funding should be sought for implementation of this project.

B. Wayne County SR Department *

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions)
 - a. Design bridges, culverts, and overflow sections. The County SR Department follows a very detailed list of design standards for all projects within the county.
 - b. Continually working with the Utah Department of Transportation (UDOT) on various projects since the UDOT dispenses federal funding. While the UDOT provides technical advice concerning guidelines and standards, they do not provide equipment, materials, or personnel.
2. Responsibility and authority in the regulating, inspecting or funding of projects:
 - a. Responsible for and have authority to regulate and inspect all projects completed within the county.
 - b. All projects funded by the state or federal government are designed by a consulting engineer and meet the usual acceptable federal standards. Inspection of federal aid projects is the responsibility of the consulting engineering company and is overseen by the county to ensure standards are met. Many county projects are designed with in-house expertise and engineers are consulted if problems arise.
 - c. All funding in one-way or another comes through the county, whether it is a certain percentage of the federal aid project or 100% of the county projects.
3. Leadership and coordination with other government agencies:
 - a. Local Agencies: The County SR Department has little interaction with other county agencies concerning roads and bridges. They do, however, coordinate with various county agencies concerning right of way and right of way purchasing. The legal aspect of right of way purchasing is overseen by the States Attorney's Office. The land values are usually developed by the Tax Equalization Office and approved by the County Commission.
 - b. Non-local Agencies: The County SR Department coordinates with various State and Federal agencies for technical assistance, permitting,

environmental concerns, archeological sites, and cultural issues. These agencies include the Utah Department of Transportation, US Fish and Wildlife, Corp of Engineers, and the Utah Historical Society.

4. General recommendations/Emergency Management concerns:
 - a. Wayne County SR Department should assist local government with floodplain management and water development permitting.
 - b. Assist with a re-addressing project as needed.

C. Central Utah Public Health

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions)
 - a. Deal with bona fide health hazards using cause and effect in those areas for both mitigation and risk reduction. If it is a hazard affecting any number of persons and within the scope of public health, Central Utah Public Health (CUPH) will mitigate or exercise risk reduction through several methods ranging from enforcement of statutes to immunization programs.
 - b. Environmental Health has the knowledge and also access to the State Health Department for mitigation of incidents with hazardous or toxic wastes.
 - c. Programs include; waste water treatment, water pollution, public health nursing, immunization programs, solid waste regulation, food establishment inspections, air quality, and vector control.
2. Responsibility and authority in the regulating, inspecting or funding of projects.
 - a. CUPH Health is a unit of state government that operates through agreements or Memorandums of Understanding with the Utah Department of Health to enforce state public health statutes within the Six County district. Tax levies provide funding. There are no funding programs for non-operational programs.
3. Leadership and coordination with other government agencies:
 - a. Local Agencies: Within the scope of public health, CUPH coordinates with the following local agencies; Wayne County Emergency Management, Wayne County Emergency Medical

Service, local law enforcement agencies (city and county), local school boards, and planning and zoning agencies.

- b. Non-local Agencies: Within the scope of public health, CUPH coordinates with the following agencies; Utah Department of Health and state and federal law enforcement agencies.

4. General recommendations/Emergency Management concerns:

- a. Public Health is normally under funded and understaffed at all levels of government. Should CUPH be called upon for expertise at a time of emergency or disaster, it normally does not have instrumentation for site level determinations of any kind without support from other agencies.
- b. Public health agencies should be included in equipment storage; e.g., FEMA equipment "stored" and used at public health agencies, rather than being stored at a warehouse. For example, radio equipment that belongs to FEMA is based at county emergency management offices; the same could be done with air sampling equipment or other instruments/kits etc., which could be used by public health agencies both for daily work and at a time of emergency or disaster.

D. Wayne County Sheriff's Department

- 1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
 - a. Responsible for law enforcement and criminal investigation in unincorporated areas of the county and in smaller towns that do not have police departments.
 - b. Provide standard law enforcement manpower and equipment.
 - c. In disaster situations, provide; warning, rescue assistance, evacuation assistance, security, traffic control, and information assistance.
 - d. Provide public awareness and educational programs. (911 education, safe kids program, etc.)
 - e. Have mutual aid agreements with all surrounding counties and the Utah State SR Patrol.
- 2. Responsibility and authority in the regulating, inspecting, or funding of projects:
 - a. None

3. Leadership and coordination with other government agencies:
 - a. Local Agencies: Within the scope of law enforcement, the Wayne County Sheriff's Department coordinates with various local agencies. These agencies include Wayne County Emergency Management and various local police departments.
 - b. Non-local Agencies: Wayne County Sheriff's Department coordinates with appropriate state and federal agencies including; Utah SR Patrol, Utah Attorney General's Office, Bureau of Criminal Identification, Utah Department of Transportation, National Park Service, National Forest Service, Bureau of Land Management and Federal Bureau of Investigation.
4. General recommendations/Emergency Management concerns:
 - a. Coordinate with and participate in local intra-agency planning and exercise endeavors.

E. Wayne Fire District

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
 - a. Respond to fires in order to protect lives, limit injuries, and minimize damage to property and the environment.
 - b. Respond to accidents in order to provide rescue assistance.
 - c. Assist Emergency Medical Services in providing emergency assistance to sick and injured. (first responders)
 - d. Provide standard firefighting manpower and equipment.
 - e. Respond to spills and releases of hazardous materials and assist in mitigating the detrimental human and environmental effects of these occurrences.
 - f. Respond to emergencies resulting from natural occurrences such as storms, floods, etc., and assist in mitigating the detrimental results of these occurrences.
 - g. Provide training for department members that will enable them to effectively and efficiently carry out their respective duties and responsibilities.

- h. Develop and provide educational programs that promote the prevention of fires and encourage fire-safe and fire-smart activities.
 - i. Assist in enforcement of city fire ordinances.
 - j. Fire investigation.
 - k. Provide assistance to other jurisdictions, as department resources and commitments allow. Wayne Fire District has mutual aid agreements with Wayne, Millard, Piute, Sanpete and Sevier Counties.
 - l. Inspections and preplanning within the fire district to reduce hazards and aid in fire prevention.
 - m. Assist with the county's tier two reporting. (Hazardous materials storage sites)
 - n. In disaster situations, provide assistance in warning, rescue, evacuation, and situation updates.
2. Responsibility and authority in regulating, inspecting, or funding of projects:
- a. None
3. Leadership and coordination with other government agencies:
- a. Local Agencies: In efforts to decrease vulnerability to hazards, the Wayne Fire District coordinates with various local agencies. These agencies include Wayne County Emergency Management, Wayne County Sheriff's Department, Loa Fire Department, Hanksville Fire Department, Lyman Fire Department, Torrey Fire Department, local Public Works, and local Emergency Medical Services.
 - b. Non-local Agencies: Utah State Fire Marshal and the Federal Emergency Management Agency, Dixie National Forest, Fishlake National Forest, National Park Service and Bureau of Land Management.
4. General recommendations/Emergency Management concerns:

Our district has seen an increase in number and variety of calls. As first responders, we have to train and equip our fire departments for various situations that may arise, such as: vehicle extrication, various types of hazardous materials, and many other types of responses. Each added type of response increases the need for equipment and the time our volunteers need

to spend in training. With the recent decrease in population in our district, volunteer retention and recruitment is also a concern.

- a. Seek funding outside of the district for additional equipment that will improve the effectiveness of our responses as well as increase the margin of safety for our volunteers.
- b. Explore training options to cover the expanding variety of responses in our district.
- c. Look into recruitment and retention programs that will work in our district.

F. Utah State University Extension Service *

1. Mitigation and Risk Reduction: (including agency's role, capabilities, and programs that support mitigation actions.)
 - a. The Utah State University Extension Service provides practical, research-based information and educational programs to address critical issues facing individuals, families, agricultural producers, business operators, and communities.
 - b. County Extension Agents serve as subject-matter experts, educational planners, adult and youth teachers and community facilitators in several areas including agriculture and natural resources, horticulture, family and consumer sciences, 4-H and youth community development.
 - c. Provide planning, designing, implementing, and evaluating of educational programs for livestock and forage clientele.
 - d. Areas of responsibility include beef and dairy cattle, swine, other livestock, water quality, waste management, and forages.
 - e. Provide programming for county citizens in the areas of family financial management, environmental concerns, housing, health and wellness, aging, foods and nutrition, parenting, and human development.
 - f. Serve as an information resource in dealing with drought, winter storms, summer storms etc. in relation to agriculture, environment, water resources, etc.
 - g. Assist with damage assessment related to agriculture.

2. Responsibility and authority in regulating, inspecting, or funding of projects:
 - a. Authority is at federal level.

3. Leadership and coordination with other government agencies:
 - a. Local Agencies: Wayne County Emergency Management and Central Utah Public Health.
 - b. Non-local Agencies: Utah State University, Utah State Health Department, United States Department of Agriculture, and Farm Service Agency.

4. General recommendations/Emergency Management concerns:
 - a. None.

APPENDIX II: COMMUNITY CAPABILITIES

Torrey Town Capability Assessment

Administrative and Technical		
Staff	Yes/No	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief building official	No	
Floodplain admin	No	
Emergency manager	Yes	No, No, Unknown
Community planner	No	
Civil engineer	No	
GIS coordinator	No	
Technical	Yes/No	
Waning systems/services (reverse 911, outdoor warning signals)	Yes	
Hazard data and info	No	
Grant Writing	No	
How can these capabilities be expanded to improve and reduce risk?		
It would help to have a person and one back-up trained and coordinated with other towns. Make agreement with other towns agencies for mutual benefits.		
Financial Resources for Hazard Mitigation		
Funding Resource	Access/Eligible	Has the funding resources been used in the past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	No	Yes, yes
Fees for water, sewer, gas, or electric services	Yes	Yes, yes
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or specific tax bonds	Yes	
Incur debt through private activities	No	
Community development block grant program	Yes	

Other federal funding programs	Yes	
State funding programs	yes	
Education and Outreach		
- No education and outreach programs		

Loa Town Capability Assessment

Planning and Regulatory		
Plans	Yes/No	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/ Master Plan	Yes	No, no, yes
Capital Improvements Plan	Yes	No, No, Yes
Economic Development Plan	No	
Local Emergency Operations Plan	Yes	Yes, no, yes
Continuity of operations plan	No	
Transportation plan	No	
Stormwater management plan	Yes	Yes, no, yes
Community wildfire protection plan	no	
Building code, permitting, and inspections	Yes/No	Are Codes Adequately enforced?
Building Code	Yes	Version/Year: IBC/2009
Land Use Planning and Ordinances	Yes/No	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
Floodplain ordinance	No	No floodplain in Loa
Natural hazard specific ordinance (Stormwater, steep slope, wildfire)	Yes	Stormwater on own property
Flood insurance rate maps	No	
Acquisition of land for open space and public recreation uses	No	
Administrative and Technical		
Administration	Yes/No	Describe capability Is coordination effective?
Planning Commission	Yes	

Mitigation Planning Committee	No	
Maintenance programs to reduce risk (e.g. tree trimming, clearing drainage systems)	Yes	Maintenance is done as needed to prevent hazardous conditions
Mutual Aid Agreements	No	
Staff	Yes/No	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Yes/ PT	Yes, no, yes
Floodplain Administrator	No	
Emergency Manager	Yes	Mayor Jeffery Olsen
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	No	
Technical	Yes/No	Describe Capability has capability been used to assess/mitigate risk in the past?
Warning systems/services (reverse 911, outdoor warning signals)	Yes	Warning siren at Loa firehouse
Hazard data and information	No	
Grant writing	Yes	Clerk writes grants
HAZUS Analysis	no	
Financial (funding resources for hazard mitigation)		
Funding resource	Access/ eligibility	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Yes	No/possibly
Authority to levy taxes for specific purposes	Yes	No
Fees for water, sewer, gas, or electric services	Yes	No
Impact fees for new development	Yes	No
Storm water utility fee	No	No
Incur debt through general obligation bonds and/or special tax bonds	Yes	No
Incur debt through private activities	No	No
Community development	Yes	No

block grant		
Other federal funding programs	Yes	No
State funding programs	Yes	No
Education and Outreach		
No education and outreach programs		

Bicknell Town Capability Assessment

Planning and Regulatory		
Plans	Yes/No	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/ Master Plan	No	The only plans the town has are in the Six County and Wayne County plans
Capital Improvements Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of operations plan	No	
Transportation plan	No	
Stormwater management plan	No	
Community wildfire protection plan	No	
Building code, permitting, and inspections	Yes/No	Are codes adequately enforced?
Building Code	Yes	Follows the county's codes and uses county building inspector
Land Use Planning and Ordinances	Yes	Yes, yes
Zoning ordinance	No	
Subdivision ordinance	No	
Floodplain ordinance	No	
Natural hazard specific ordinance (Stormwater, steep slope, wildfire)	No	
Flood insurance rate maps	No	
Acquisition of land for open space and public recreation uses	No	
How can these capabilities be expanded to improve and reduce risk?	They could be expanded and updated. However there is so little growth that it currently is not much of an issue.	

Administrative and Technical		
Administration	Yes/No	Describe capability Is coordination effective?
Planning Commission	No	Town Council & County level
Mitigation Planning Committee	No	
Maintenance programs to reduce risk (e.g. tree trimming, clearing drainage systems)	Yes	Town maintenance
Mutual Aid Agreements	No	
Staff	Yes/No	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	No	
Floodplain Administrator	No	
Emergency Manager	No	
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	No	
Comments: This is a small town and can't afford staff. We hire outside experts as needed.		
Technical	Yes/No	Describe Capability has capability been used to assess/mitigate risk in the past?
Warning systems/services (reverse 911, outdoor warning signals)	Yes	Siren on fire station, and reverse 911
Hazard data and information	No	
Grant writing	No	
HAZUS Analysis	no	
Comments: Any professional assistance would help		
Financial (funding resources for hazard mitigation)		
Funding Resource	Access/Eligibility	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Yes	Yes for maintenance and improvements, but minimal, yes
Authority to levy taxes for specific purposes	Yes	Limited by state municipal code
Fees for water, sewer, gas, or electric services	Yes	For water systems
Impact fees for new development	No	

Storm water utility fee	Yes	To pay bonds on storm drain system
Incur debt through general obligation bonds and/or special tax bonds	Yes	Currently have none
Incur debt through private activities	No	
Community development block grant	Yes	Not recently used
Other federal funding programs	?	
State funding programs	Yes	CIB
Education and Outreach		
No education and outreach programs: relies on county level education		

Lyman Town Capability Assessment

Planning and Regulatory		
Plans	Yes/No	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/ Master Plan	No	Not complete
Capital Improvements Plan	Yes	Through Six County AOG
Economic Development Plan	Yes	Wayne County Plan & Six County AOG
Local Emergency Operations Plan	Yes	
Continuity of operations plan	No	
Transportation plan	No	
Stormwater management plan	No	
Community wildfire protection plan	No	
Building code, permitting, and inspections	Yes/No	Are Codes Adequately enforced?
Building Code	Yes	
Building Code effectiveness grading schedule (BCEGS) Score	Yes	
Fire department ISO rating	Yes	
Land Use Planning and Ordinances	Yes/No	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	Yes	
Subdivision ordinance	Yes	

Floodplain ordinance	No	
Natural hazard specific ordinance (Stormwater, steep slope, wildfire)	No	
Flood insurance rate maps	No	
Acquisition of land for open space and public recreation uses	No	
Administrative and Technical		
Administration	Yes/No	Describe capability Is coordination effective?
Planning Commission	Yes	Yes, Dan Summers
Mitigation Planning Committee	No	
Maintenance programs to reduce risk (e.g. tree trimming, clearing drainage systems)	No	
Mutual Aid Agreements	Yes	Cooperation with Wayne County
Staff	Yes/No	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Yes	Yes, Eric Togerson
Floodplain Administrator	No	
Emergency Manager	Yes	Yes, Jeri Johnson
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	No	
Technical	Yes/No	Describe Capability has capability been used to assess/mitigate risk in the past?
Warning systems/services (reverse 911, outdoor warning signals)	No	
Hazard data and information	No	
Grant writing	No	
HAZUS Analysis	no	
Financial (funding resources for hazard mitigation)		
Funding resource	Access/ eligibility	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Yes	

Authority to levy taxes for specific purposes	No	
Fees for water, sewer, gas, or electric services	No	
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	No	
Incur debt through private activities	No	
Community development block grant	Yes	
Other federal funding programs	Yes	
State funding programs	Yes	
Education and Outreach		
Town operates an Ongoing Public Education Program		

Hanksville Town Capability Assessment

Planning and Regulatory		
Plans	Yes/No	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/ Master Plan	No	
Capital Improvements Plan	Yes	Yes to al
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of operations plan	No	
Transportation plan	No	
Stormwater management plan	No	
Community wildfire protection plan	No	
Building code, permitting, and inspections	Yes/No	Are Codes Adequately enforced?
Building Code	Yes	Wayne County building code applies to Hanksville
Building Code effectiveness grading schedule (BCEGS) Score	No	

Fire department ISO rating	N/A	
Land Use Planning and Ordinances	Yes/No	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	Yes	Yes
Subdivision ordinance	Yes	
Floodplain ordinance	No	
Natural hazard specific ordinance (Stormwater, steep slope, wildfire)	No	
Flood insurance rate maps	No	
Acquisition of land for open space and public recreation uses	No	
Administrative and Technical		
Administration	Yes/No	Describe capability Is coordination effective?
Planning Commission	No	
Mitigation Planning Committee	No	
Maintenance programs to reduce risk (e.g. tree trimming, clearing drainage systems)	Yes	Town maintenance employee does routine cleaning of debris and hazards to reduce risk
Mutual Aid Agreements	Yes	Wayne County provides police and EMS services
Staff	Yes/No	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Yes	Yes
Floodplain Administrator	No	
Emergency Manager	No	
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	No	
Technical	Yes/No	Describe Capability has capability been used to assess/mitigate risk in the past?
Warning systems/services (reverse 911, outdoor warning signals)	Yes	Firehouse outside siren to give warning signal No
Hazard data and information	No	
Grant writing	No	

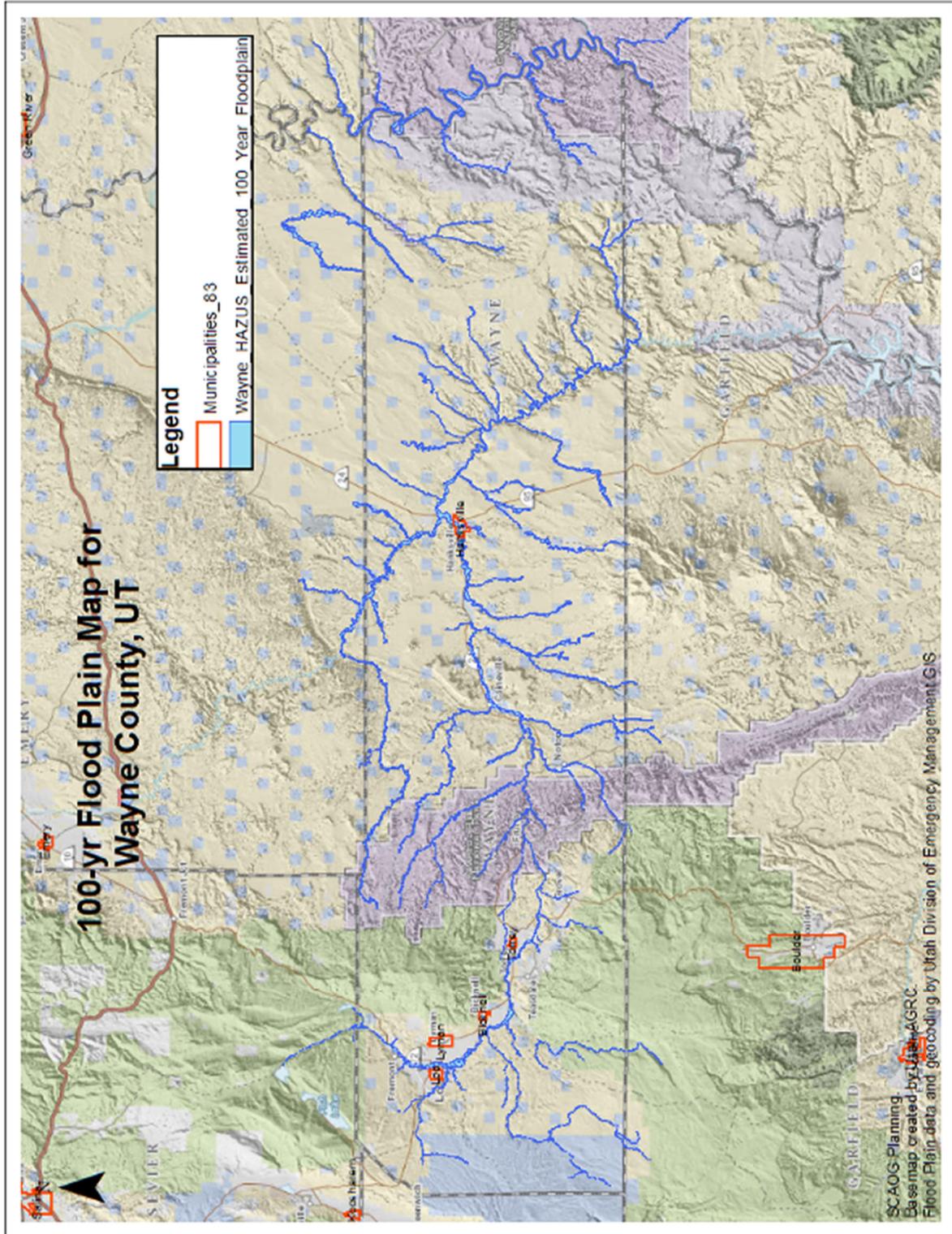
HAZUS Analysis	No	
Financial (funding resources for hazard mitigation)		
Funding resource	Access/ eligibility	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Yes	Water system upgrade
Authority to levy taxes for specific purposes	Yes	No
Fees for water, sewer, gas, or electric services	Yes	No- could be used in the future
Impact fees for new development	Yes	Yes- impact fee for future development
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	Yes- sewer upgrade, water
Incur debt through private activities	No	
Community development block grant	Yes	Affordable housing units, EMS building
Other federal funding programs	No	
State funding programs	Yes	CIB funds- equipment purchased, road improvements
Education and Outreach		
Program/Organization	Yes/No	
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	Town Council and local EMS providers

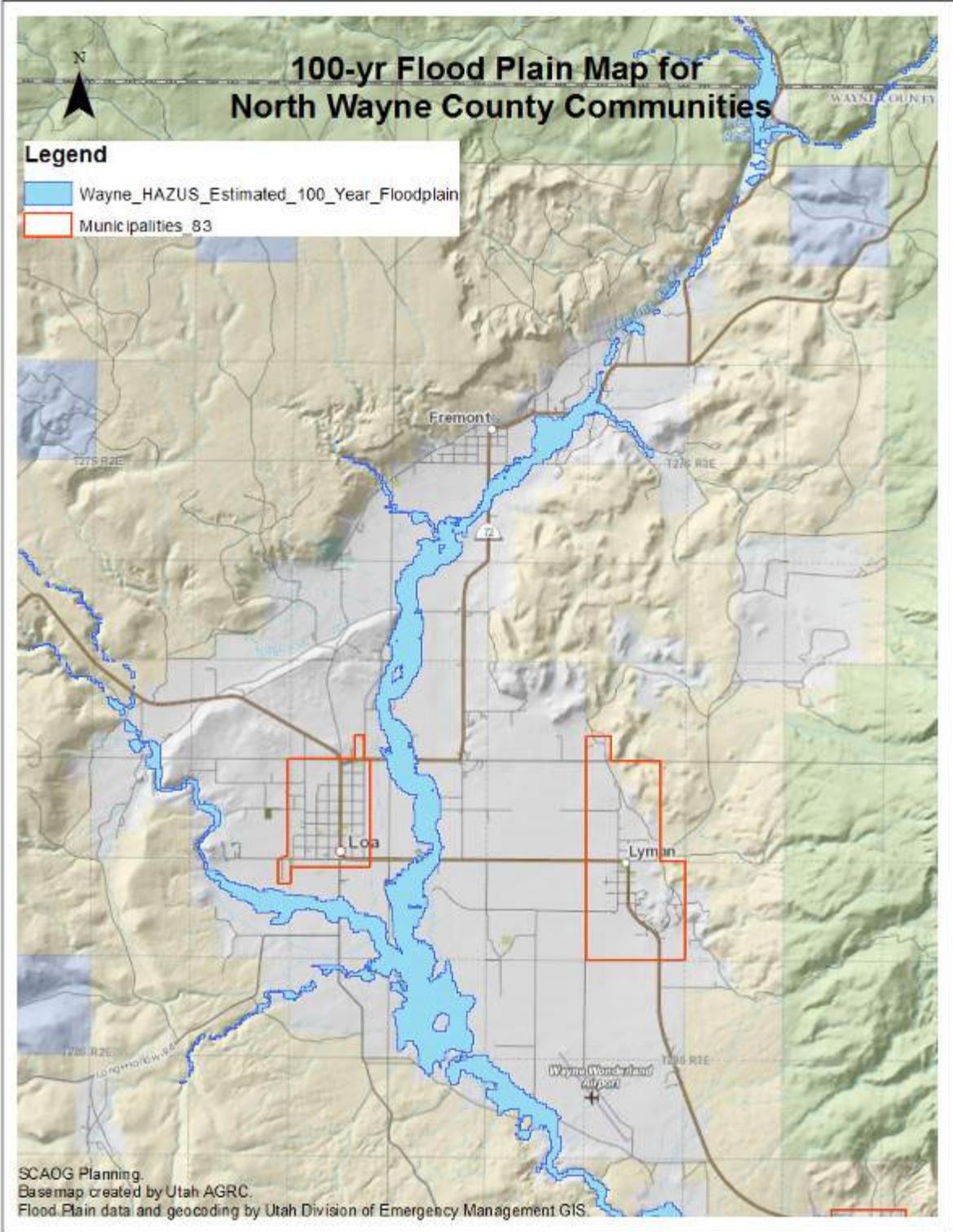
APPENDIX III: OTHER AGENCY RESOURCES

A. Mitigation and risk reduction:

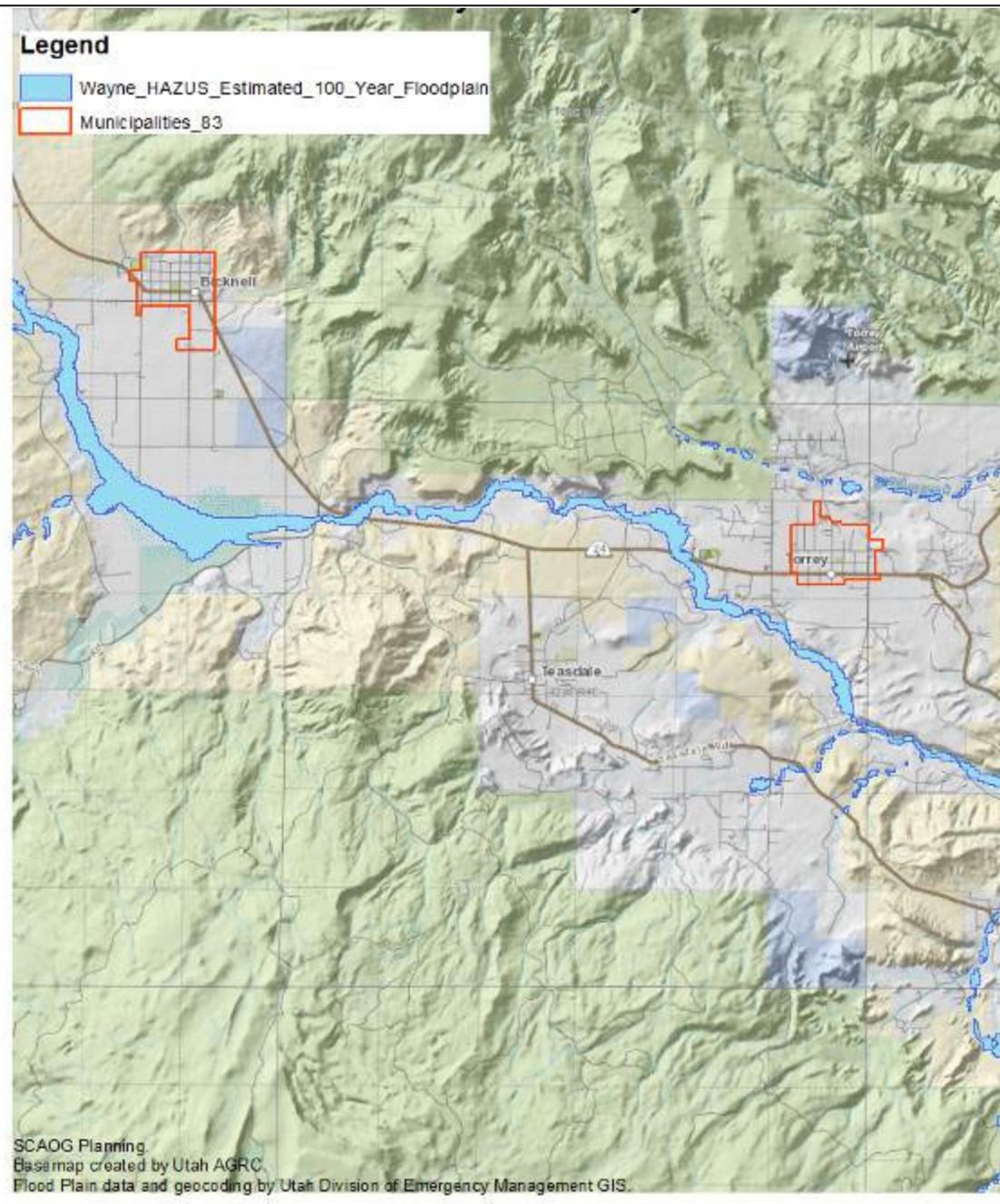
1. Wayne County Social Services: Temporary assistance to needy families, food stamps, medically needy programs, adult services, homeless assistance, family planning, etc.
2. Army Corps of Engineers: Water and dam management within the county. Provide technical expertise, sandbags, and heavy equipment.
3. Utah SR Patrol: Situation and damage assessment; provide transportation resources for movement of state personnel, supplies, and equipment to include air and ground reconnaissance; traffic control.
4. State Fire Marshal: Hazmat SR utilization; HAZMAT technical assistance; situation and damage assessment.
5. Forestry, Fire & State Lands: Debris removal from recreational facilities; technical assistance; situation and damage assessment.
6. Utah Division of Wildlife Resources: Technical assistance; debris removal from recreational facilities; facility improvements; situation and damage assessment.
7. State Radio Communications: Exercise readiness of warning systems and communication support.
8. Department of Agriculture: Assists with situation and damage assessment; coordination with USDA; HAZMAT technical assistance; state land use program.
9. Department of Workforce Services: Situation assessment and administration of disaster unemployment assistance programs.
10. Human Services: Insure liaison with private relief agencies for disaster victims.
11. State Historical Society: Project screening and situation assessment.

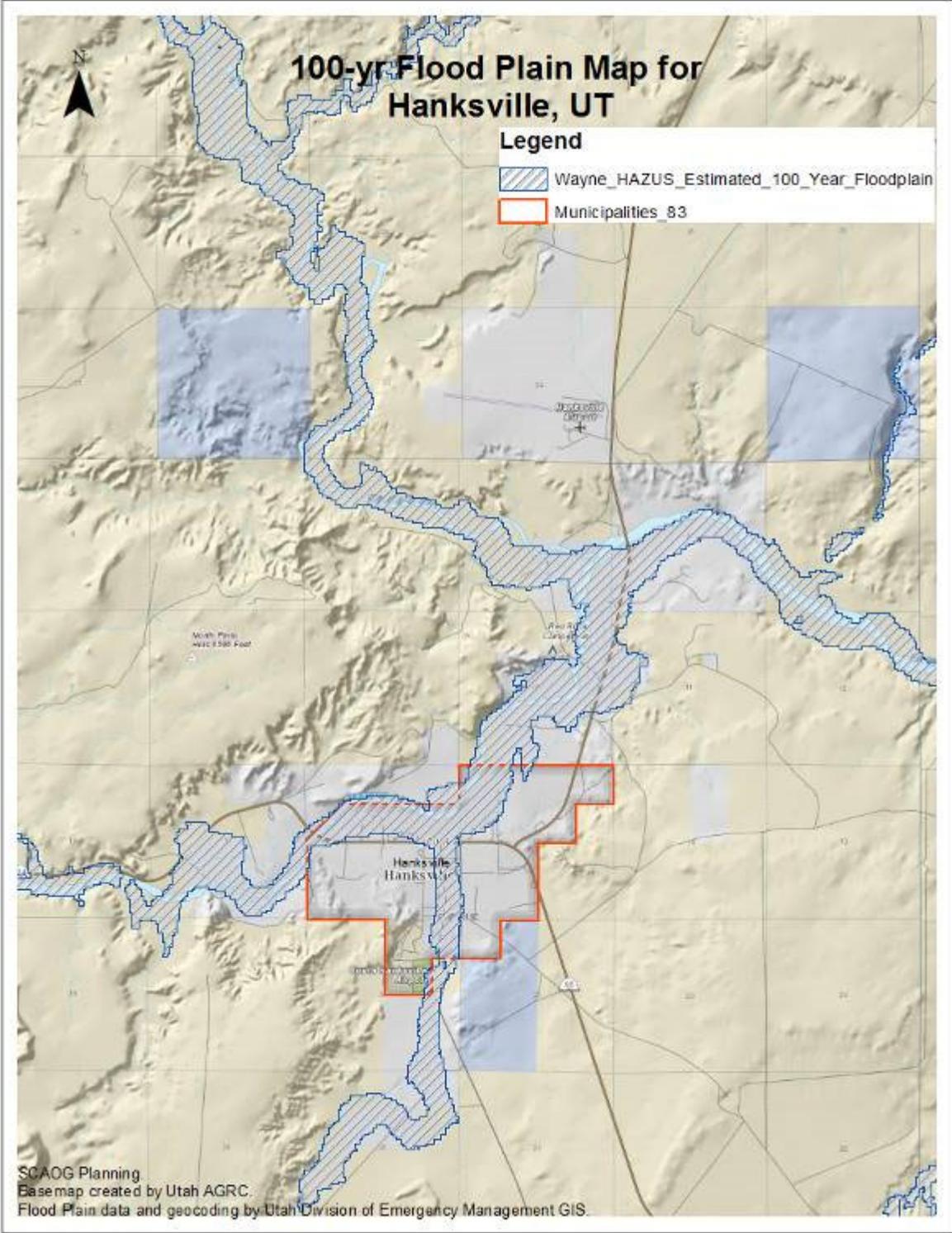
APPENDIX IV: 100-YEAR FLOODPLAIN MAPS





100- Year Floodplain of West Central Wayne County

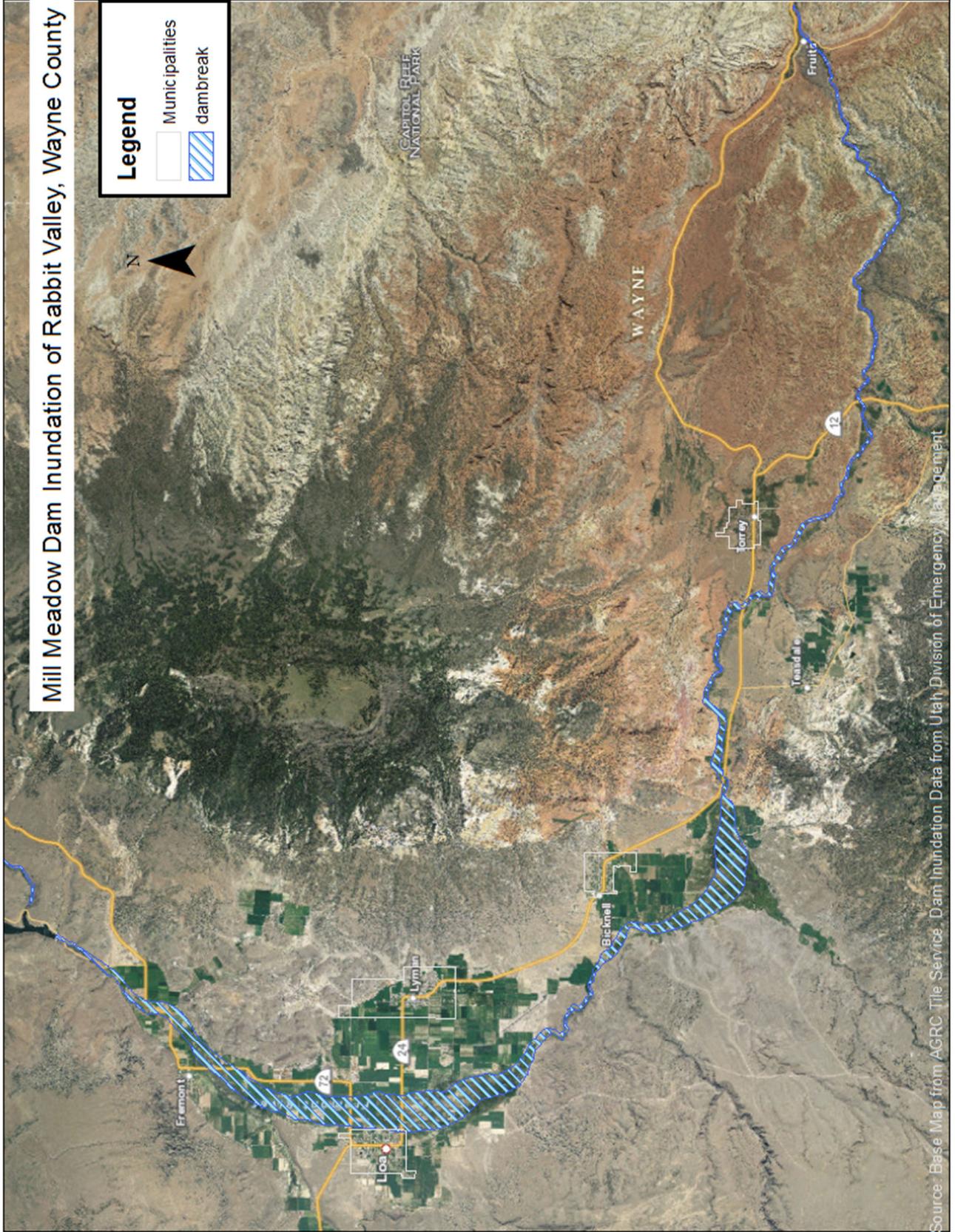




APPENDIX V- LANDSLIDE MAPS

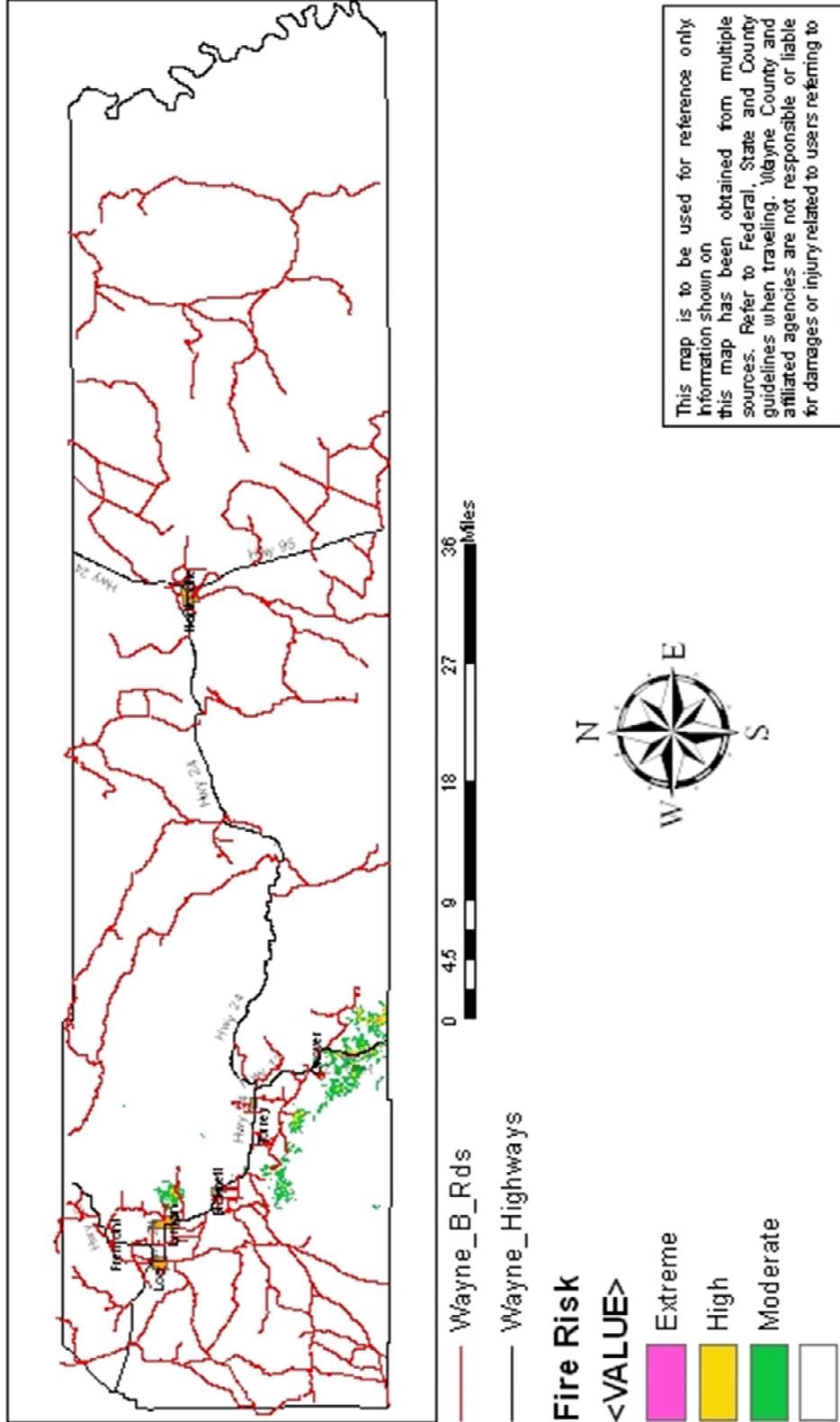
APPENDIX VI- MILL MEADOW INUNDATION MAP

Mill Meadow Dam Inundation of Rabbit Valley, Wayne County

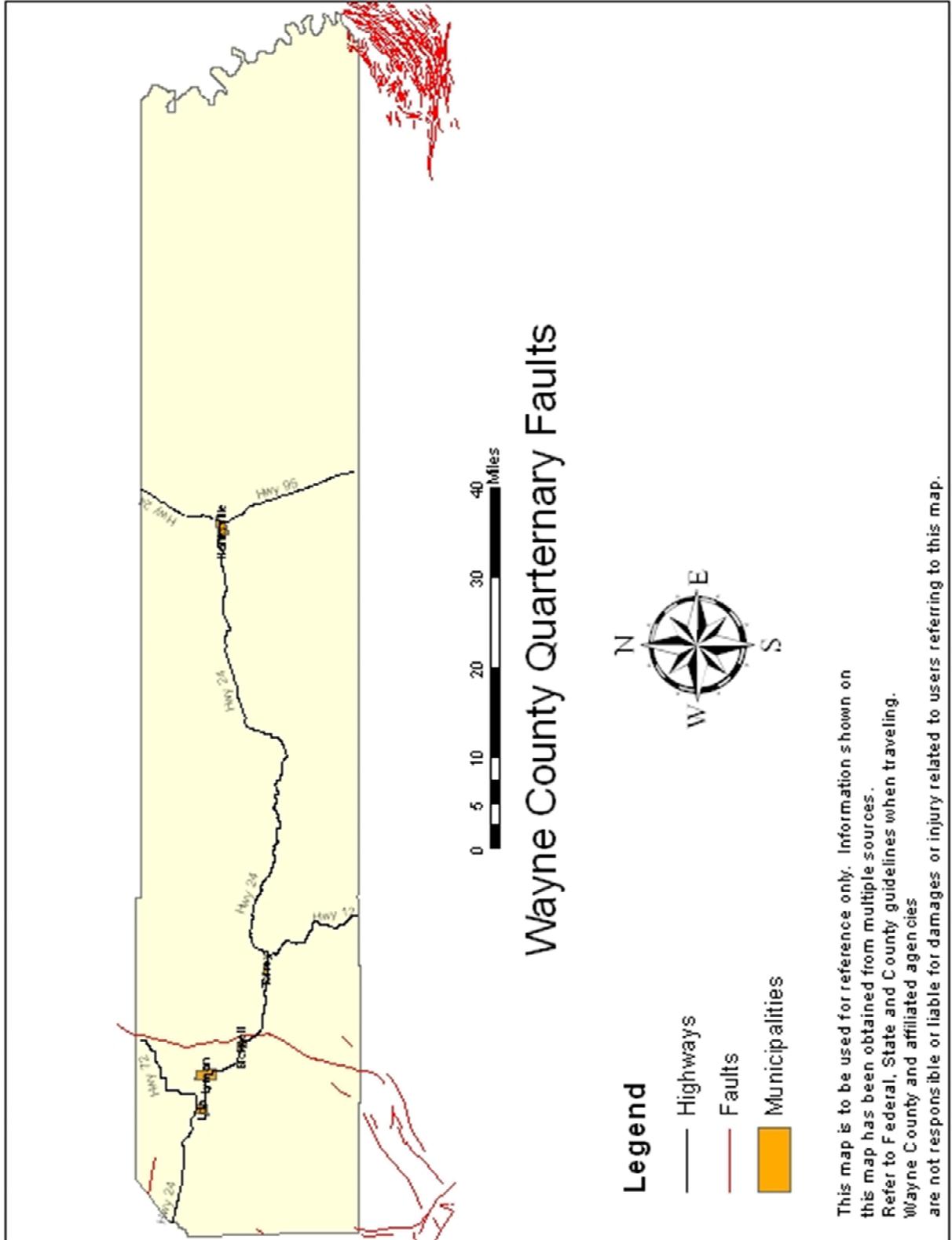


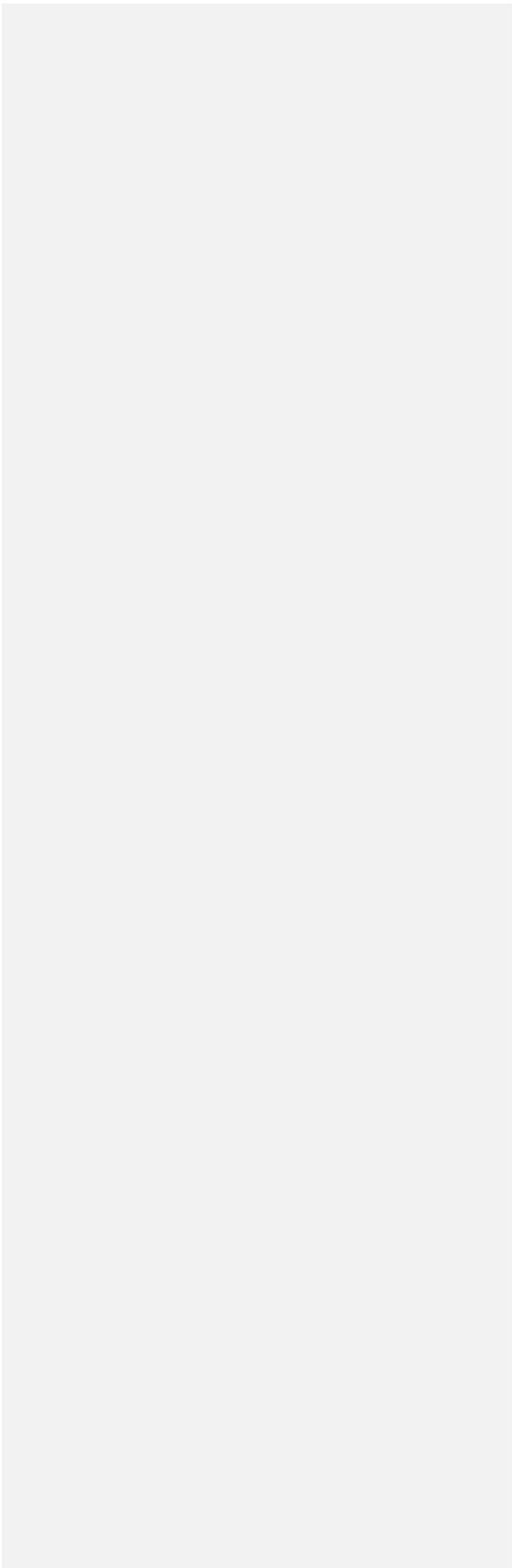
APPENDIX VII: WILDFIRE RISK

Wayne County Wildfire Risk



APPENDIX VIII: QUARTERNARY FAULTS





Comments on the 2003 SCAOG Mitigation Action Plan

SECTION 8

Contents

Millard County 2003 Strategies	2
Millard County Earthquake Mitigation Goals	2
COMMENTS:.....	3
Millard County Flood Mitigation Goals	3
Millard County Landslides Mitigation Goals	7
Millard County Wildfire Mitigation Goals	8
Millard County Problem Soils Mitigation Goals	9
Millard County Dam Failure Mitigation Goals	10

This comment section only explains what has been done with the Millard County Plan. The counties of Juab, Piute, Sanpete, Sevier, and Wayne did not provide comment on what strategies from the 2003 plan has been acted on.

Millard County 2003 Strategies

Millard County Earthquake Mitigation Goals

Goal 1 Reduce Risk of Damage due to Potential Earthquakes

Problem Identification: Millard County has numerous identified earthquake faults, including populated areas.

Objective 1.1 Reduce threat to population and structures from earthquake damage.

Action: Control new construction in known fault areas by ordinance and zoning.

Time Frame: Ongoing

Funding: Existing planning/zoning budget funds, grants as identified and awarded

Estimated Cost: Minimal

Staff: Existing planning/zoning, Building Inspection, and Emergency Management departments

Background: Much of the identification of existing faults are identified and mapped in State of Utah and/or Federal Geologic surveys. Development of protective/restrictive ordinances to control building in those identified areas could be a natural extension of the above listed Millard County departments.

Action: Educate citizenry through existing Community Emergency Response Teams.

Time Frame: Ongoing

Funding: Millard County, DES/FEMA

Estimated Cost: \$3,000

Staff: Millard County Emergency Management CERT Trainers

Background: Although an initial response to catastrophic damages/casualties may be limited by ongoing funding constraints, the citizenry can and is being educated to begin the process of taking care of themselves and neighbors until responders can be mobilized.

Objective 1.2 Minimize damage due to earthquake activity in existing buildings on faults

Action: Retrofit existing buildings on fault lines.

Time frame: Depends on funding available

Funding: TBD

Estimated Cost: TBD

Staff: TBD

Background: Funding, costs, and staff requirements would be an unknown until these structures are identified as public, private, etc., and the priorities determined.

COMMENTS:

There have been ongoing efforts to educate the public through existing Community Emergency Response Teams as mentioned in the second action of Objective 1.1. Zoning ordinances have been enforced as well (first action of Objective 1.1). Both of these projects can be considered ongoing. Existing buildings have not been retrofitted

Millard County Flood Mitigation Goals

Goal 1 Reduce Risk of Potential Flooding

Problem Identification: About 30 percent of Millard County’s population lives in unincorporated areas of the county. Many live in the areas surrounding Delta and Fillmore. Development should be avoided adjacent to Sevier and Beaver Rivers (and their tributaries) where the threat of flooding is greatest. Unincorporated Millard County has a FEMA designation of Zone D, “Areas of undetermined but possible flood hazards”. Principle Lakes/Reservoirs include DMAD, Fool Creek, Clear Lake, and Gunnison Bend, Scipio, and Sevier (Dry) Lake.

Objective 1.1 Minimize future flood damage in the county.

Action: Nonstructural measures appear to be the most prudent option for the county to implement in the unincorporated areas. Zoning to prevent development of structures near all rivers, creeks, and lakes would be prudent (100 ft minimum setback or greater) as well as not allowing development on alluvial fans. New development near canals should also be discouraged, as there have been several potentially deadly flood events in the state due to flooding caused by canal failures. The cost of modifying county regulations and ordinances to include these recommendations is \$20,000 and the benefits substantial. It should be anticipated that there would be a small percentage of the population that will oppose any zoning or other changes in the regulations and ordinances.

Time Frame: Based on funding.

Funding: TBD

Estimated Cost: \$20,000

Staff: County/Contractual

Action: Encourage 100 foot setbacks in areas of undetermined flood risk.

Time Frame: 1-3 years

Funding: Unknown

Estimated Cost: Unknown

Staff: County Building Officials, County Planning and Zoning

Background: Defined setbacks will protect structures from flooding.

Comments:

These are ongoing projects. Nothing substantial has been done to fulfil these objectives and actions.

Objective 1.2 Promote flood insurance throughout the County

Action: Create outreach document promoting flood insurance and include in local newspaper(s), libraries, and other public buildings.

Time Frame: 1 year

Funding: Minimal

Estimated Cost: Unknown

Staff: County Engineer, State Floodplain Manager, DES

Background: General public is usual not aware they can purchase flood insurance.

Comments:

This Action was not implemented. It will be included on the 2015 plan.

Objective 1.3 Reduce threat of unstable canals throughout the County. Identify County-wide canal systems.

Action: Map and assess for structural integrity canal systems in the County.

Time Frame: 3-5 years

Funding: Federal grants

Estimated Cost: Unknown

Staff: County Engineer, County Public Works, County Information and Technology, County Emergency Management

Background: Private and Public canals are used for transportation and dispersion of water as well as flood control.

Objective 1.4 Ensure Emergency Operations Center(s) (EOC) is/are equipped to respond to flooding.

Action: Obtain communication equipment that will allow for timely response to flooding.

Time Frame: 1 year

Funding: Federal Grants

Estimated Cost: \$30,000

Staff: County Sheriff, County Emergency Management

Comments:

All canals in Millard County are privately owned and maintained. This action has not been fulfilled, and it is unlikely to use government funding for mitigation, and to have owners accept a canal project.

Problem Identification: Lynndyl is situated on a plateau well above and away from the Sevier River floodplain. It is definitely eligible for a FEMA No Special Flood Hazard Area designation.

Objective 1.5 Officially recognize Lynndyl as a NSFHA

Action: Draft and adopt a NSFHA ordinance
Time Frame: TBD
Funding: TBD
Estimated Cost: Minimal
Staff: County/Contractual

Comments:
This has not been implemented, Lynndyl has no participation in NFIP. This has been added to the 2015 action plans.

Problem Identification: Chalk Creek at Fillmore* has a drainage area of about 67 square miles. The creek channel is highly incised through much of the community. Structural inventory taken in 1994 indicates as many as 90 structures could be vulnerable to flooding. Vulnerable structures are primarily located where Chalk Creek crosses Highway 99 and downstream to I-15.

Objective 1.6 Reduce flood threat from Chalk Creek within Fillmore City

Action: Maintain and improve existing levee along Chalk Creek.
Time Frame: Six months to one and a half years
Funding: Routine maintenance, County public works
Estimated Cost: Minimal
Staff: County Public Works

Background: Flatten the side slopes, filling in depressions and rodent holes, and removing any deep-rooted plants along the levee. Fill and protect locations where the levee is eroded with riprap or other armoring.

Action: Add a levee or floodwall upstream from Highway 99 to prevent breakout flows

Time Frame: Two years
Funding: HMGP
Estimated Cost: Minimal
Staff: Contractual

Action: Maintenance of channels and bridge openings

Time Frame: Immediate
Funding: Routine maintenance
Estimated Cost: Minimal
Staff: City Staff

Background: Keep all bridge openings and upstream channels free of debris to prevent constriction during high flows.

Action: Initiate floodplain-mapping study to determine whether a flood threat does exist.

Time Frame: Three to five years

Funding: State Division of Emergency Services

Estimated Cost: Minimal

Staff: State and Contractual

Background: Fillmore has a FEMA No Special Flood Hazard Areas (NSFHA) designation.

Action: Advise residents of the availability of flood insurance.

Time Frame: Immediate

Funding: County

Estimated Cost: Minimal

Staff: Floodplain Manager

Background: Inform residents adjacent to the channel of the potential risk of flooding and advise them flood insurance is available. Because of Fillmore's designation flood insurance is priced very reasonably.

*Fillmore mitigation recommendations from Sevier River and Tributaries, Utah Reconnaissance Report prepared by the US Army Corp of Engineers Sacramento District March, 1994.

Comments:

This has not been implemented. If it is a considerable action plan for the future, funding would have to be the responsibility of Fillmore City and private water owners. The County can/will coordinate any mitigation, but cannot fund it.

Objective 1.7 Minimize future flood damage due to flooding along county roads

Action: Minor Flood Channeling, in conjunction with county roadwork.

Time Frame: Depends on funding.

Funding: TBD

Estimated Cost: TBD

Staff: County

Background: None.

Objective 1.8 Minimize future flood damage due to flooding on Scipio Canal

Action: Clean Scipio Canal

Time Frame: Depends on funding.

Funding: TBD

Estimated Cost: TBD

Staff: TBD

Background: None

Comments:

This has not been implemented. It will be added to the 2015 plan as a consideration.

Millard County Landslides Mitigation Goals

Goal 1 Reduce Risk of Damage due to Potential Landslides

Objective 1.1 Obtain better and more detailed scientific data in areas of landslides

Action: Require geological and geotechnical reports for any proposed developments in the designated landslide areas with the possibility of independent reviews of the reports.

Time Frame: With development engineering plans for the area

Funding: Developer

Estimated Cost: Unknown

Staff: Licensed Geology and Geotechnical Firms

Background: This should be required through an Ordinance.

Comments:

Not implemented. Added to the 2015 plan

Objective 1.2 Ensure new developments in areas of landslide concern are protected utilizing scientific data

Action: Require developers to install developments according to recommendations from the geological and geotechnical reports provided and approved.

Time Frame: As landslide areas develop

Funding: Developer

Estimated Cost: Unknown

Staff: Developer and Contractor

Comments:

Not implemented. Added to the 2015 plan

Objective 1.3 Reduce structural damage due to landslides in existing buildings

Action: Remove existing buildings from landslide zones; Resettle population in safer zone.

Time frame: Immediate

Funding: TBD

Estimated Cost: Unknown

Staff: TBD

Background: None

Comments:

Not implemented.

Millard County Wildfire Mitigation Goals

Goal 1 Reduce Risk of Potential Fire

Problem Identification: Millard County has a moderate wildfire risk in the county. Areas of concern include: Delta, Fillmore, Holden, Leamington, and Scipio. Range fires are also of concern.

Objective 1.1 Reduce risk of damage by fire in Fillmore.

Action: Clear-cut trees and brush to establish fire break east of Fillmore city.

Time Frame: Depends on Funding

Funding: TBD

Estimated Cost: TBD

Staff: TBD

Background: None.

Comments:

Some fire break work has been done by local fire marshal in cooperation with Utah Division Fire and Forestry.

Commented [FR1]: Some fire break work has been done by local fire marshal in cooperation with Utah Division Fire & Forestry.

Objective 1.2 Reduce threat and impact of wildland fire at the local level

Action: Create community fire safe councils and implement the “Community Fire Planning” process.

Time Frame: Ongoing

Funding: Obtain grant monies and alternative sources of funding through various grants and foundation.

Estimated Cost: \$5,000.00 per plan

Staff: Unknown

Background: The “Community Fire Planning” process was implemented through the Utah Division of Forestry, Fire, and State Lands in support of on-going efforts under the National Fire Plan to educate and empower landowners to take action to reduce the threat of wildfires within a community.

Comments:

No implemented. Added to the 2015 Update.

Objective 1.3 Develop fuel modification program

Action: Implement fuel modification program and projects.

Time Frame: Ongoing

Funding: Grants and private landowners

Estimated Cost: Variable based on acreage and type of materials being removed.

Staff: State, County, Cities, Towns and residents

Commented [FR2]: Some completed in Oak City area by fire marshal in cooperation with Utah Division of Fire & forestry.

Background: Through the creation of defensible space in and around communities, the threat of catastrophic wildfires will be greatly reduced.

Comments:
Some completed in Oak City area by fire marshal in cooperation with Utah Division of Fire and Forestry.

Objective 1.4 Educate and inform the community of fire prevention

Action: Develop and implement community outreach fire prevention program.

Time Frame: Immediate and ongoing

Funding: Unknown

Estimated Cost: \$5,000.00 per year

Staff: County Planning and Zoning, Building Department, Fire Warden

Background: Education is the key to informing homeowners about the risk of wildfires. Through a comprehensive education program, homeowners can take independent action to protect values at risk and understand the effects of wildfires.

Comments:
Not Implemented. Added to 2015 Plan.

[Millard County Problem Soils Mitigation Goals](#)

Goal 1 Reduce Risk of Damage due to Problem Soils

Objective 1.1 Reduce risk to new construction from problem soils

Action: Development in problem soil zones should be limited by ordinance.

Time Frame: Depends on funding.

Funding: TBD

Estimated Cost: \$20,000

Staff: County/Contractual

Action: Plant trees west of Hinckley, Leamington, Lynndyl, and Oak City to prevent spread of silica dunes.

Time Frame: Depends on funding.

Funding: TBD

Estimated Cost: Unknown

Staff: County/Contractual

Background: None

Comments:
Neither action items have been implemented.

Millard County Dam Failure Mitigation Goals

Goal 1 Reduce Risk of Dam Failure

Problem Identification: Millard County has 14 dams with various amounts of impoundment. Most are earthen berm construction. Some would impact residential structures if failure occurred; all would have economic impact if lost.

Commented [FR3]: Technically 15 now, with impoundment created by Magnum Gas near IPP.

Objective 1.1 Minimize damage to new and existing buildings due to Dam Failure

Action: Emergency Management will actively participate with Utah Department of Natural Resources (DNR) on dam inspections.

Commented [FR4]: This is regularly done presently.

Time Frame: Ongoing

Funding: TBD

Estimated Cost: Minimal

Staff: Millard County Emergency Management & dam owners

Background: DNR annually inspects all dams within Millard County and suggests or mandates safety actions when necessary. With participation and follow up visits from local emergency management to ensure suggested and/or mandated actions are taken, dam owners may recognize local impact beyond loss of irrigation water.

Comments:
There are now 15 dams. Presently EM regularly actively participates with the DNR on dam inspections.

Objective 1.2 Identify areas of impact

Action: Initiate review of dam inundation mapping to identify impact areas.

Time frame: 3 years

Funding: TBD, possible FEMA grants

Estimated Cost: TBD

Staff: Emergency Management, Building Inspection, Planning/Zoning

Background: Current inundation maps need to be reviewed to make sure they reflect the risk.

Comments:
Not Implemented. Will be included in 2015 Plan.

Section 9

Mitigation Strategies

Pre-Disaster Mitigation Plan of the Six County Region

Chelsea Bakaitis
[Date]

About

The mitigation strategies of this document have an emphasis on new and existing buildings and infrastructure. The mitigation strategies provide plans of action on how they will be implemented. . Communities prioritized the strategies they submitted.

The elected officials and staff of jurisdictions have provided strategies for mitigating the hazards they consider to be in their communities. Those communities not listed have chosen to not participate.

- Bicknell Town
- Central Valley Town
- Circleville Town
- Delta City
- Ephraim City
- Fountain Green
- Glenwood Town
- Gunnison City
- Hanksville Town
- Hinckley Town
- Holden Town
- Juab County
- Leamington Town
- Loa Town
- Lyman Town
- Lynndyl Town
- Manti City
- Marysvale Town
- Mona City
- Nephi City
- Oak City Town
- Redmond Town
- Rocky Ridge Town
- Sanpete County
- Sevier County
- Spring City
- Torrey Town
- Millard County
- Juab County
- Sevier County
- Sanpete County

The following Jurisdictions participated in providing strategies:

C o u n t y	J u a b C o u n t y	Mitigation Action/Project Title	H a z a r d s A d d r e s s e d	Background/Issue	Ideas for Integration	Resp onsib le Age ncy	Partners	Potenti al Fundin g	Cost Estimat e	Benefits: (Losses Avoided)	Timeli ne	P r i o r i t y	Work sheet Com plete By:
J u a b C o u n t y	J u a b C o u n t y	Emergency Backup Generator for Juab County Road Department Shop	G e n e r a l , E a r t h q u a k e	We power is out: communications are down, overhead doors cannot be opened, and air compressor and, fuel system is inoperable. When lights are not on unsafe conditions exist in shop.	Hire licensed electrical contractor to purchase the appropriate generator for our needs and to correctly install the generator to code.	Juab County	None	Federal Grants	\$58,255	The Juab County Road Department will be able to function as normal if severe weather storms, high winds, snow, earthquakes, flooding, fire, etc. knocks out the power service the road shed. The backup generator will make it possible to be able to assist where needed during these emergency situations.	6 months	H i g h	Lynn Ingram, Juab County Road Department
J u a b C i t y	M o n a C i t y	Additional fuel storage for sewage treatment plant back-up generator	G e n e r a l , E a r t h q u a k e	Community on septic tank system, but has new membrane technology treatment facility. There is concern about ability to operate plant during utility outage such as may occur in earthquake. In the case of an outage there would be health and safety issues.	designed and constructed fuel tank for 1 week of storage. Working with treatment plant staff to develop operation plans.	Mona City	None	Out sewer budget is presently over-taxed and is unable to accommodate this project	Approximately \$49,000	Give time in an emergency to abate or create additional plans, and address sanitation issues. If treatment facility cannot operate, there will be serious health, safety, and environmental issues.	As soon as is possible	H i g h	Jonathan B Jones, Councilman

J	M	Stockpile of 12-inch water pipe (300 feet & supplies)	E	The primary water supply comes from a spring that flows to water tanks, treatment facility, and distribution lines. The water line crosses the Wasatch Fault and is highly susceptible to disruption in earthquake. In the event of a major earthquake it may be difficult to obtain pipe or quickly repair it. This water reserve will be quickly depleted in event water supply is disrupted. There is concern about ability of water storage tanks to withstand earthquake forces. Tanks have structural issues and need to be supplemented or replaced at some point.	Pipe will be purchased, along with associated materials to install. These materials will be stockpiled inside city maintenance shed. The city will rely on contractor to make repair.	Mona City	None	We do have a small budget for such projects, but there is much to do and minimal budget to accomplish everything	~\$7,000 for pipe and supplies	Ability to quickly repair water supply line to meet water needs of community, and maintain sufficient fire flows for public safety.	Immediate	High	Jonathan B Jones, Councilman
J	M	New city water tank	E	Water tanks are deteriorating and serious concern that earthquake would cause these tanks to fail. If this occurs, we lose the ability to meet the water needs of community, including flows for fire suppression.	50,000 gallon water storage tank will be designed and constructed to meet current building standards for seismic zone	Mona City	None	Grants	\$900,000	Water storage is critical to health and safety needs of community. Without water storage it is impossible to meet both short-term and long-term needs, including maintaining sufficient fire flows for public safety.	Within next two years	High	Jonathan B Jones, Councilman
J	M	Financial Help with New Water Line	W	The primary water supply for Mona City comes from a spring which flows to our water tanks, treatment facility, and distribution lines. Until recently, we have only had one line feeding water into our city. This water line crosses under the I-15 freeway to get from storage tanks to the city.		Mona City, Utah	The water line has been installed. We will seek out financial help to offset some of these costs. The project costs city	Project has been paid for with reserved funding, but doing so has stressed our financial situation	\$400,000	We have been very concerned that a failure of this water line could create an immediate long-term outage that would leave our city without water for culinary, sanitation, and safety needs, including flows for fire suppression.	Immediate	High	Jonathan Jones, Councilman

							about \$400,000. Annual Town Budget is \$500,000.	to uncomfortable levels					
J u a b	M o n a C i t y	Earthquake Retrofit Town Hall	E a r t h q u a k e	Our City building, although generally adequate for most of our needs, is in need of replacement or upgrading. Our primary concern at this time, is one of safety. This building is constructed or reinforced masonry, and will likely not survive a moderate to large earthquake. This creates concern for the safety of our staff and for the people of our town. Our city building is where we conduct our city business. It is also our command post in the event of an emergency. We desire to either renovate the existing building, or to build a new building that will safely accommodate these important purposes. As a small community, we have limited financial resources. These resources have recently been stretched thin as we have addressed significant health and safety issues, particularly the construction of a redundant water line to the city. It is our hope that we can obtain some financial assistance to help us address this safety concern.	We desire to have our engineering contractor design a building renovation or replacement to meet current seismic code.	Mona City	We have no cost share partners, but do work with engineering and construction contractors to accomplish objectives	We have minimal budget, and are hopeful to get some assistance to make this project possible	\$700,000	It is important to safe-guard our staff and public with a building that is structurally sound and able to function in the event of an earthquake, which is a large risk factor for our region.	In the next two years	H i g h	Jonat han Jones, Coun cilma n
J u a b	N e a p h	Flood Channel Cleaning	F l o o d	Big Hollow is designated flood channel running east and west through Nephi. Trees growing in the	Scope of work to be developed and force-account or	Nephi City	U.S. Army Corps of Engineers	local budget, grants	\$45,000	Channel cleaning will prevent flood waters from being pushed through and out of	Octobe r 15, 2015 throug	H i g h	Rand y McK night,

	i C i t y			channel and other debris need to be removed.	contract labor and equipment secured					channel walls	h March 15, 2016		City Admi nistrat or
J u e a p h i C i t y	N e p h i C i t y	Plan Coordination	G e n e r a l	Nephi City and Juab County both have emergency response plans that overlap. Nephi City has a multiple master plans that need to be coordinated.	Coordination among multiple agencies and plans	Nephi City	Juab County, Utah Division of Emergency Managem ent	Local Budget, grants	\$10,000	Coordination of plans and ordinances	Septem ber 1, 2015 throug h August 31, 2016	H i g h	Rand y McK night, City Admi nistrat or
J u e a p h i C i t y	N e p h i C i t y	Flood Channel Culvert Renovation	F l o o d	Culverts crossing city streets along Big Hollow need renovation in order to accommodate projected flows.	Scope of work to be developed integrating Corps of Engineers policies and city's drainage master plan	Nephi City	U.S. Army Corps of Engineers	grants	\$480,000	Culverts can be modified to accommodate flows projected in storm water drainage master plan, allowing safe flows through town.	March 1, 2016 throug h Decem ber 31, 2017	M e d i u m	Rand y McK night, City Admi nistrat or
J u e a p h i C i t y	N e p h i C i t y	Detention Basin Capacity Restoration	F l o o d/ D e b r i s F l o w	A structure installed across Salt Creek east of Nephi traps gravel and other debris as the stream flow slows. The basin in front of the structure has filled up, and gravel and debris need to be removed.	Scope of work to be developed in conjunction with the Corps of Engineers.	Nephi City	U.S. Army Corps of Engineers	Local funding, grants	\$670,000	Debris retention capacity of the basin will be restored, holding debris away from the community where deposits create flooding	Decem ber 1, 2016 throug h Decem ber 31, 2017	H i g h	Rand y McK night, City Admi nistrat or
J u e a p h i C i t y	N e p h i C i t y	Retention Basin Cleaning	F l o o d	A retention basin constructed to receive storm-flow run-off from Miller Canyon has filled up with silt. The silt needs to be removed.	Scope of work to be developed in coordination with participating agencies and Juab County	Nephi City	Utah State Engineer, NARCS, other Rural Developme nt Agencies, and Juab County	Local funding, grants	\$100,000	The holding capacity of the Miller Canyon storm water detention basin will be restored to prevent flash flooding	Januar y 1, 2017 throug h Decem ber 31, 2017	M e d i u m	Rand y McK night, City Admi nistrat or
J u e a p h i C i t y	N e p h i C i t y	Stormwater Management Plan Implementation	F l o o d	Phase 1 includes detention basins and connecting piping.	Coordination with plan partner Juab County	Nephi City	NRCS, other Rural Developme nt agencies, Juab County	Local Funding , partner grants	\$2,031,0 00	Flood damage from Stormwater events	1 to 3 years	H i g h	Rand y McK night, City Admi

	ity												nistrat or
J u a c k b	R o c k y R i d g e T o w n	Educate residences of dangers from fire and earthquakes	E a r t h q u a k e	700 residents- lots of young people with little understanding of potential dangers	publication to be distributed, speakers to address the issues, banners and signaling cards in every home	Rocky Ridge Town	Town and SCAOG	Grants	\$3-5K	Public awareness and action plans	1-2 years	m e d i u m	Kent Allred, Mayor
J u a c k b	R o c k y R i d g e T o w n	Fire Break	W i l d f i r e	We have wild lands on two sides of our community and need a fire break to protect against these things (fire) historically it has happened twice before.	We would grade 50 ft. wide	Town or Juab Fire District	Town, State, Juab Fire Strict	Grant-Labor Match	\$60,000	Loss of homes within 500 ft. of wild lands	1-2 years	H i g h	Kent Allred, Mayor
J u a c k b	R o c k y R i d g e T o w n	Additional means of evacuation	G e n e r a l	We have only one paved and one grand exit from town--both cross the railroad in a rail event we would be stuck	work with neighbors to north and south to develop additional egress routes	Rocky Ridge Town	Santaquin City, private property owners, Rocky Ridge Town	Grants-To purchase easements and improve driving surfaces	\$100,000	Evacuation when primary Exits are blocked	1-5 years	H i g h	Kent Allred, Mayor
M i c	D e l t a	Delta City Sewer Main Upgrade	E a r	Delta City has some old sewer mains that were	Replace old pipe with PVC or	Delta City	None	FEMA, CIB,	\$2 million	Newer PVC or HDPE sewer mains would be less likely to be		H i g	Travis

I l a r d	l t C i t y		th q u a k e	originally put in as ground water drainage pipes. These pipes are old and fragile and any small earthquake or disaster could possibly collapse the mains	HDPE pipe or reline the existing pipe to better withstand disaster			CDBG, Delta City		damaged in a disaster and would be easier to repair than the old concrete and clay tile sewer mains	h	Stanworth/ Delta City Public Works	
M i l l a r d	D e l t a C i t y	Delta City Culinary Water System Upgrade	E a r t h q u a k e, F l o o d	Some of the city's water line are in need of upgrading to larger diameter pipe to meet fire flow in the event of a disaster, and some of the older pipes would not handle the stress of an earthquake or flooding.	Replace the fragile and under size pipe with new PVC or HDPE pipe that would better handle a disaster	Delta City Corp	None	FEMA, CIB, CDBG	\$2 million	Old asbestos cement pipe, and lead caulk joint pip would be replaced to be able to better handle a disaster. Also the smaller pipe would be replaced with larger pipe to be able to handle fire flow.	M e d i u m	Travis Stanworth/ Delta City Public Works	
M i l l a r d	H i n c k l e y T o w n	Standby Generator for Critical Facilities	S e v e r e W e a t h e r	Hinckley Town, and the unincorporated communities of Oasis and Deseret experience frequent short-term and potential long-term power outages due to high winds. These outages disrupt water service from the central well and water treatment facility supporting these communities. These outages also cause failure of the sewer lift stations in Hinckley Town.		Hinckley Town	Oasis and Deseret (unincorporated Communities)	\$80,000	Uninterrupted water services and reduce risk of raw sewage overflowing.	Coordination of plans and ordinances	2016	H i g h	Brian Flora ng, Hinckley City Council
M i l l a r d	H o l l d e n T o w n	Division Ditch, Engineering	F l o o d i n g	Flooding (erosion-vegetation eroded on east side of town, debris flow)	utilize current facility	local	local, Millard county	FEMA, CIB	\$300,000	Debris flow eliminated	on-going, stated in 2005	l o w	Brent Bennett, Former Mayor
M i l l a m	L e a m	Historic Town Hall	E a r t h q	Seismic activity, flood damage	Historic, Rail Road	Leamington Town	CIB, FEMA, Historical Society	CIB, UT Historic Society	\$1 million	Historical Preservation, Preserve Town Hall, Museum and youth	2015-2016	H i g h	Marlow Plum/ Coun

i	il	construction in known fault areas by ordinance and zoning	earthquake	of existing faults are identified and mapped in State of Utah and/or Federal Geological surveys.	protective/restrictive ordinances to control building in those identified areas could be a natural extension of listed Millard County departments.	ng planning/zoning, Building Inspection, Emergency Management Department	s	Funds		population and structures from earthquake damage.	g	st Roper, SCAOG Emergency Manager
M	Millard County	Educate Citizenry through existing Community Emergency Response Teams	Earthquake	Although an initial response to catastrophic damages/casualties may be limited by ongoing funding constraints, the citizenry can and is being educated to begin the process of taking care of themselves and neighbors until responders can be mobilized.	Millard County EM, CERT	Jurisdictions	County Funds	\$3,000	Reduce the threat to population and structures from earthquake damage.	Ongoing	Forrest Roper, SCAOG Emergency Manager	
M	Millard County	Retrofit existing buildings on fault lines	Earthquake	Funding, costs, and staff requirements would be unknown until these structures are identified as public, private, etc. and the priorities determined	Millard County	None	County Funds and Grants	Unknown	Minimize damage due to earthquake activity in existing buildings on faults	Depends on funding available	Forrest Roper, SCAOG Emergency Manager	
M	Millard County	Non Structural Measures to prevent flooding. Includes, zoning and limiting development	Flood	30% of population lives in unincorporated areas. The threat of flood is greatest adjacent to the Sevier River. Unincorp. Area is designated Zone D (NFIP).	Millard County	Contracted	FEMA, County Funds, CIB	\$20,000 (cost of modifying county regulations and	Protect people and property from flooding.	Depends on funding available	Forrest Roper, SCAOG	

d	C o u n t y						ordinanc es.					Emer gency Mana ger
M i l l a r d	M i l l a r d C o u n t y	Encourage 100 ft. setbacks in areas of undetermined flood risk	Fl o o d	30% of population lives in unincorporated areas. The threat of flood is greatest adjacent to the Sevier River. Unincorp. Area is designated Zone D (NFIP).	Milla rd Count y	County Building Officials, County Planning and Zoning	County Funds	Unknow n	Defined setbacks will protect structures from flooding	1-3 years		Forre st Roper , SCA OG Emer gency Mana ger
M i l l a r d	M i l l a r d C o u n t y	Promote Flood Insurance	Fl o o d	General public is not aware they can purchase flood insurance	Count y Engin eer, State Flood plain Mana ger, DES	None	County Funds, FEMA	Unknow n	Prevent high costs of flooding to homeowners.	1 year		Forre st Roper , SCA OG Emer gency Mana ger
M i l l a r d	L y n n d y l T o w n	Draft and adopt a NSFHA ordinance	Fl o o d	Lynndyl is situated on a plateau well above and away from the Sevier River floodplain. It is definitely eligible for a FEMA No Special Hazard Area designation	Lynn dyl Town	County/Con tractual	FEMA, County Funds, CIB	Minimal	Lynndyls flood risk will be fully examined.	1 year		Forre st Roper , SCA OG Emer gency Mana ger
M i l l a o	F i l l m o	Maintain and improve existing levee along chalk creek	Fl o o d	Chalk Creek has a drainage area of 67 square miles, and channel is incised through community. Vulnerable structures are located where Chalk Creek crosses Highway 99 and downstream to I-15.	Fillm ore City	County Public Works	Fillmore City and private land owners	minimal	prevent flooding	routine maintenanc e, six months to a year		Forre st Roper , SCA

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M	F	Add Levee or floodwall upstream from Highway 99	Fl o o d	Chalk Creek has a drainage area of 67 square miles, and channel is incised through community. Vulnerable structures are located where Chalk Creek crosses Highway 99 and downstream to I-15.	Fill ore City	County Public Works	FEMA	Minimal	Prevent breakout floods	two years		Forre st Roper , SCA OG Emer gency Mana ger
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M	F	Maintenance of channel and bridge openings	Fl o o d	Keep all bridge openings and upstream channels free of debris to prevent constriction during high flows	Fill ore City	Millard County	Routine Mainten ance	Minimal	Orient constriction during high flows	Immed iate		Forre st Roper , SCA OG Emer gency Mana ger
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M	F	Initiate floodplain-mapping study to determine whether a flood threat does exist	Fl o o d	Fillmore has a FEMA NSFHA designation	Fill ore City	State and Contractual	State Division of Emerge ncy Services	Minimal	More accurately depict flooding in Fillmore City	Three to five years		Forre st Roper , SCA OG Emer gency Mana ger
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M	F	Advise residents of the availability of flood insurance	Fl o o d	Fillmore's designation flood insurance is priced very reasonably	Fill ore City Flood plain Mana ger	Millard County	County	Minimal	Less economic loss in the event of a large flood.	immedi ate		Forre st Roper , SCA OG Emer gency Mana ger
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M	M	Minor flood	Fl		Milla	None	FEMA,	Unknow	Minimize future	Depends on		Forre

Millard County	channeling in conjunction with county roadwork	ordinance			Millard County		CIB	None	flood damage due to flooding along county roads	funding available	Forrest Roper, SCAOG Emergency Manager
Millard County	Clean Scipio Canal	Flood			Scipio Town	Millard County	FEMA, CIB	Unknown	Minimize future flood damage on the Scipio Canal	Depends on funding available	Forrest Roper, SCAOG Emergency Manager
Millard County	Require geological and geotechnical reports for any proposed developments in the designated landslide areas with the possibility of independent reviews of the reports	Landslide	Required through an ordinance		Millard County	Licensed Geology and Geotechnical Firms	FEMA	Unknown	Obtain better and more detailed scientific data in areas of landslides	Unknown	Forrest Roper, SCAOG Emergency Manager
Millard County	Require developers to install developments according to recommendations from the geological and geotechnical reports provided and approved.	Landslide			Millard County	Developers and contractors	FEMA	Unknown	Ensure new developments in areas of landslide concern are protected utilizing scientific data	Immediate	Forrest Roper, SCAOG Emergency Manager
Millard County	Create community	Wildfire	The "Community Fire Planning" process was		Millard County	Jurisdiction	FEMA,	\$5,000	Reduce the risk of	Ongoing	Forrest Roper, SCAOG Emergency Manager

Millard County	fire safe councils and implement the "Community Planning Process"	implemented through the Utah Division of Forestry, Fire, and State Lands in support of ongoing efforts under the National Fire Plan to educate and empower landowners to take action to reduce the threat of wildfires within a community.	rd County	s	and other grants	per plan	damage by fire in Fillmore.	g	st Roper, SCAOG Emergency Manager
Millard County	Clear-cut trees and brush to establish fire break east of Fillmore City		Fillmore City	Millard County	FEMA, and other grants	Unknown	Reduce risk of damage by fire in Fillmore.	Depends on funding available	Forrest Roper, SCAOG Emergency Manager
Millard County	Implement Fuel Modification Program and Projects	Develop fuel modification program.	Millard County	State, County, Cities, Towns, and residences	grants and private landowners	variable based on acreage and types of materials being removed	The threat of catastrophic wildfires will be greatly reduced	Ongoing	Forrest Roper, SCAOG Emergency Manager
Millard County	Develop and implement community outreach fire prevention program.	Through a comprehensive education program, homeowners can take independent action to protect values at risk and understand the effects of wildfires	County Planning and Zoning, building department, fire warden	State, County, Cities, Towns, and residences	FEMA, and other grants	\$5,000 per year	Educate and inform the community of fire prevention.		Forrest Roper, SCAOG Emergency Manager

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M	M	Initiate review of dam inundation mapping to identify impact areas	D	Current inundation maps need to be reviews to make sure they reflect the risk.		Emerg ency Mana geme nt, Build ing Inspe ction, Plann ing/Z oning	None	FEMA, and other grants	Unknow n	Areas of impact are identified to further guide policy.	3 years		Forre st Roper , SCA OG Emer gency Mana ger
P	C	Sevier River, Flooding Mitigation	F	River Froze, water backed up flooding town	Diversion	River water users	Piute County, Division of Water, NRCS	NRCS	\$375,000	Loss of Personal Property	One Year	H	Darin Bush man, Com missioner
P	M	Pine Circle/ Bullion Canyon Wildfire Mitigation	W	No fire break between community and mountains, been discussed with USFS for past three years	Thinning project	USFS , State Fire	City, USFS, State Fire, County, NRCS	USFS, State Fire, SRC	\$400,000	Eliminate Heart of wildfire in wilderness and town	next 18 months	H	Darin Bush man, Com missioner
P	M	Beaver Creek/ Wildfire Mitigation	W	No fire break between community and mountains, been discussed with USFS for past three years	Thinning project	USFS , State Fire	City, USFS, State Fire, County, NRCS	USFS, State Fire, SRC	\$400,000	Eliminate Heart of wildfire in wilderness and town	next 18 months	H	Darin Bush man, Com missioner

	I e T o w n												
P i u t e	M a r y s v a l e T o w n	Flood Retention Pond	Flood	Heavy Floods out of Drainages		Town of Marysvale	None	FEMA, CDBG, CIB	\$2,000,000	Flooding in town	5 to 10 years	Medium	Wade Fautin, Mayor
S a p h p r e t e	E p h r a i m C i t y	Repairing Tunnel	Earthquake	There is also a tunnel that provides 65% of potable drinking water, and 20% of agricultural water. Water from this tunnel generates electricity in four hydro-generating electricity plans. Tunnel was constructed in late 1930's and has been deteriorating at an accelerating pace. Even a small earthquake would collapse the tunnel and completely city off water supply. At that point the remaining sources of water (35% of supply) would not be sufficient to provide water for town.	allow tunnel to withstand small earthquakes and last another 80 years	Ephraim Water and Sewer	None	FEMA	\$4 Million	Loss of 65% of water supply	immediately, as soon as funding is secured	1	Bryan Kimball, Community Development Director/City Engineer
S a p h p r e t e	E p h r a i m C i t y	Drilling new wells in town	Earthquake	Biggest impact from earthquake is infrastructure, especially water delivery system. All of water provided by mountain springs, and earthquake could disrupt supply with landslides etc. in drought,	provide redundancy in water system in case spring water supply is lost due to landslide or tunnel collapse	Ephraim Water and Sewer	None	FEMA	\$1 Million (first phase) to purchase water rights and	prevents loss of water supply in earthquake event	0-2 years	2	Bryan Kimball, Community Development

	C i t y		l a n d s l i d e, d r o u g h t	spring flows reduce or stop entirely. In these times remaining water supply is not enough to provide for basic needs of community. There is an emergency well, but well is tested to have unsafe arsenic levels by EPA standards, and well is not capable of supplying water to entire city.					design/c o n s t r u c t a w e l l a n d r e l a t e d i n f r a s t r u c t u r e t h a t c a n f e e d w a t e r s u p p l y				nt D i r e c t o r/ C i t y E n g i n e e r
S a p h r a i m C i t y	E p h r a i m C i t y	Complete new FEMA flood mapping	F l o o d	Unable to secure funding with major floods in 2011-2012. Need better data about flood hazard in area	to get a current idea of what areas are at risk	Ephraim City Com munit y Devel opme nt	None	FEMA	\$350,000	better understanding of where risks are to better mitigate future flooding	2016: currently working with the USACE	M e d i u m	Bryan Kimball, Com munit y Devel opme nt Direct or/ C i t y E n g i n e e r
S a p h r a i m C i t y	E p h r a i m C i t y	Improve existing flood channel	F l o o d	The existing channel runs above and along the town, placing nearly the entire town at risk if an embankment were to collapse. The embankment has eroded in places, and there are bottlenecks at bridges and other culverts that restrict the flow. The current capacity of the flood channel is not enough to handle a 100 year flood		Ephraim City Water	None	FEMA	roughly \$6M-10M	Protect the town against embankment collapse.	Timeli ne: 5-10 years, pending acquisition of funding	M e d i u m	Bryan Kimball, Com munit y Devel opme nt Direct or/ C i t y E n g i n e e r
S a p h r a i m C i t y	E p h r a i m C i t y	Construct a new flood Channel to handle flood waters in areas of new growth south of town	F l o o d	Current flood channel does not have enough capacity for a 100 year flood,		Ephraim City Water	None	FEMA	roughly \$4-\$8M	adding a second channel would allow us to split the flow and divert water directly through town in an adequate channel rather than	5-15 years	M e d i u m	Bryan Kimball, Com munit y Devel

	C i t y									across and above town, and			opment Director/City Engineer
S a p p r e a i t i m C i t y	E	Improve storm drainage facilities and repair/replace deteriorated facilities	Flood	There are various ditches that need to be cleaned/piped, culverts to replace, detention ponds to retrofit, etc.	upsized capacity	Ephraim City Water	None	FEMA	\$50K-\$100K per year on an ongoing basis	prevent flooding, upsized capacity	per year on an ongoing basis	Medium	Bryan Kimball, Community Development Director/City Engineer
S a p p r e a i t i m C i t y	E	Consider purchasing additional water trucks to haul water in times of extreme water shortage	Drought			Ephraim City	None	FEMA	\$250K for each truck	preparedness in time of water shortage		Medium	Bryan Kimball, Community Development Director/City Engineer
S a p p r e a i t i m C i t y	E	Extend airport runway	Wildfire	During recent Fairview fires, air tankers wanted to land at Ephraim airport to refuel, and replenish fire retardant, but could not because runway was too small to land/take off. They had to fly to Richfield or to Provo in order to do so, the next closest airport that was large enough to land there.	Currently completing a multi-million dollar extension to the runway that should accommodate the larger planes, but still need additional facilities such as	Ephraim City	None	FEMA	\$250K-\$1M	escalation of fire, because not enough time to refuel air tankers		Medium	Bryan Kimball, Community Development Director/City

					large refueling facilities, etc. to support such an operation.								y Engineer
S a p p r e t i e	E m C i t y	Purchase additional firefighting equipment, capable of off road maneuvering, as well as water tanker trucks that can deliver water to crews battling fires.	W i l d f i r e	Usually with drought the area is prone to wildfires. Fires devastate vegetation and usually lead to massive flooding as soon as it rains the first time after a fire, due to vegetation no longer slowing/soaking up the rain.	Ephraim City	None	FEMA	\$500K-\$2M	Prevent Wildfire in residential areas	3-10 years	M e d i u m	Bryan Kimball, Community Development Director/City Engineer	
S a p p r e t i e	E m C i t y	Purchase seed that can be stored locally, to re-vegetate/re-seed burned areas quickly without having to wait multiple weeks to order seeds	W i l d f i r e, L a n d s l i d e, F l o o d	Usually with drought the area is prone to wildfires. Fires devastate vegetation and usually lead to massive flooding as soon as it rains the first time after a fire, due to vegetation no longer slowing/soaking up the rain.	Ephraim City	None	FEMA	\$100K-\$500K	Prevent Wildfire in residential areas	3-10 years	M e d i u m	Bryan Kimball, Community Development Director/City Engineer	
S a p p r e t i e	E m C i t y	Consider and Aquifer and storage and recovery project; begin feasibility study; final project would be infiltration basins near foothills where water can recharge the aquifers, wells,	D r o u g h t	No reservoir storage system in town. to store water underground in the aquifer during times of high water, and then pump it out again in times of drought	Ephraim City	None	FEMA	\$75K for study; \$1-\$10M for completing all phases of implementation, depending on method/a	Once the snow melts and dries up there is no more reservoir storage system. This develops a new system.	Study to begin in 2015. Construction possibly to begin in 0-5 years	M e d i u m	Bryan Kimball, Community Development Director/City	

		and monitoring equipment to monitor ground water levels, and treatment facilities.							Alternative chosen				Engineer
S a n p e t e	F o u n t a i n G r e e n T o w n	Flood Control Break West Side and North side (Salt Creek)	Flood	Fires in Past- resulted in flooding/potential wildfire	Develop a flood channel to mitigate future events	City-Federal-Private Agencies	USDA, FEMA	Local, Federal	\$500,000	Avoid flooding Homes, City	within 10 years	High - West side; Med - North	Michelle Walker-City Recorder
S a n p e t e	F o u n t a i n G r e e n T o w n	Alternative Water Supply (Well)	Earthquake	Wasatch Fault- if earthquake could shut off water supply	Secure a second source of water by a water well	City	USDA, Water Agencies	CIB, Local, other, Federal/State Grants	\$648,000	secondary water supply	In process, complete within 1 year	High	Michelle Walker-City Recorder
S a n p e i	G u n n i s o n C i t y	Command Center Power Source	General	Gunnison City does not have a backup power source for City Hall, and will require a backup power source to full function as the	Contacted Rocky Mountain Power to find amount of generated power	Gunnison City	None	Grants	\$30,000 (Generator, Automatic	Ability to control, organize and facilitate emergency actions and personnel in preparation for	Spring 2016 for purchase and	1	Janell Braithwaite, City Recorder

t e o n C i t y				city's command center	needed to facilitate this action, equipment researched with possible installation				Transfer Switch Box and Installation)	disasters in coordination with the Gunnison Valley Fire Department (Readiness Station in State of Utah	installa tion		der
S a n p e t e o n C i t y	G u n n i s o n C i t y	River Bend Subdivision emergency groundwater lowering	Fl o o d	Basements in a subdivision near the San Pitch River may be prone to flooding due to the rising groundwater condition during flooding conditions in the river	Drain system between the San Pitch River and the River Bend Subdivision	Gunnison City	None	Grants	\$25,000 to study groundwater conditions; \$1,000,000 for plan implementation	Flooding and loss of basements in the River Bend Subdivision	Study Completed-2016; Implement mitigation measures recommended from study-2017	2	Garri ck Willd en, Jones & DeMi lle Engin eering
S a n p e t e C i t y	M a n t i C i t y	Northeast quadrant storm & run-off drainage	Fl o o d	as development has occurred in the area, natural drainages have disappeared and during periods of heavy rainfall or springtime run-off from the mountain face, we have experienced free flowing water in the streets, yards and interior blocks and have had some flooding of homes	We desire to install a storm drainage system along 100 North St from 600 E to 100 E to carry the drainage away from the affected areas	Manti City Water and Sewer	None	FEMA	\$150,000	Losses avoided would be property damage (including homes, outbuildings and years). Depending on the storm or amount of spring run-off, dozens of homes could be affected	Summe r/fall 2016; approx imately 30-day project	1	Kent Barto n, City Admi nistrat or
S a n p e t e C i t y	M a n t i C i t y	City Creek Channel Redevelopment	Fl o o d	City Creek is the natural historic drainage from Manti Canyon, through Manti City on a northwest course towards the Sanpitch River. Sidewalls built from stone and mortar many years ago are eroding and deteriorating. Approximately ten culvert bridges where the creek flows through the city are also in need of major repair	We desire to make needed sidewall repairs or in the channel or possibly pipe the channel. Also we would like to replace or repair of culverts that carry the creek underneath city streets as well as	Manti City Water and Sewer	Manti City Creek Water Users Association	FEMA	\$1.2 Million	Losses avoided would be property damage (including homes, outbuildings and yards) resulting from the flooding. Also protection of citizens from injury do to bridge crossings that are unsafe or could possibly be washed out during periods of high water	desire to comple te a study to determi ne best course of action- i.e. channe	2	Kent Barto n, City Admi nistrat or

				or replacement. These repairs are necessary in order to keep the creek flowing through the city without flooding homes, businesses and other public and private property.	repair bridges that cross over the creek.						l repair vs. piping of the channel		
S a n p e t e	S a n p e t e C o u n t y	Manti Canyon Flash Flood Control	Flood	Manti Canyon has a long history of flash flooding over the road during heavy rainstorms. The North side of the canyon rises above the bottom more than 2000 ft., much of it is bare of vegetation.	Install larger culverts to allow the flood water to travel under the road instead of over. Install rock to help with erosion issues.	Sanpete County Road Department	Manti City	Grants	\$5,000	Access for the public to summer cabins, and recreation areas. Manti City has a power plant where some of the flooding occurs.	Project could be started at any time.	High	Sgt. Jayson Albee, Emergency Management Director, Sanpete County Sheriff's Office
S a n p e t e	S a n p e t e C o u n t y	Professional Risk Assessment, Flooding, Fire, Earthquake, Assessment, Mapping.	General	The last known in depth assessment of Sanpete County was done around 2009. An updated assessment would help update the County's Emergency Operations Plan and Hazard Mitigation Plan.	An updated list would provide need information for new mitigation projects.	Sanpete County Road Department	None	Grants	\$50,000-\$100,000. Contracted	Hazards identified and mitigated could save untold lives and dollars.	5 yr. plan	High	Sgt. Jayson Albee, Emergency Management Director, Sanpete County Sheriff's Office

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S a n p e t e	S p r i n g C i t y	Wildfire- Fuel Load Fire Break	W i l d f i r e	Extreme fuel load in local mountains	cut using chainsaws, fire breaks around forest and residential interface	Spr i n g C i t y/ B L M/ U S F S	Spring City Citizen Corps/ Spring City Wildfire Group/BLM/Sanpete County Fire	FEMA	\$200,000	Millions in personal property, Fire could destroy our local water and power systems	12-24 months	1	Keith Chandler/ Jack Monnett
S a n p e t e	S p r i n g C i t y	Flood Dam, Canal Canyon, Oak Creek Canyon	F l o o d	Seasonal Flooding	High Water Flood Dam to control run off and flooding	Spr i n g C i t y	Horseshoe Mountain Irrigation	FEMA	\$500,000	Millions in residential property damage loss of our local hydro power and water systems, culinary irrigation	12-48 months	2	Keith Chandler/ Jack Monnett
S a n p e t e	S p r i n g C i t y	Enlarging and clearing flood channels	F l o o d	wildfire fuel load/extreme	expanding flood and drainage systems	Spr i n g C i t y	Sanpete County, Horseshoe Mt. irrigation	FEMA	\$250,000 (for cleaning and expanding)	Residential Property Loss, City water and Hydro Power Systems	12-24 months	H i g h	Keith Chandler
S a n p e t e	S a n p e t e C o u n t y	Indianola Valley EAS siren	G e n e r a l	There is no outdoor public alert system for this is very rural, isolated area of the County. The rest of the county has a siren for each of the municipalities.	Mount an external siren on a tower near the Indianola Fire Station.	Sa n p e t e C o u n t y	Indianola Fire Department , SCAOG RRT	Grant	\$60,000	Catastrophic loss of property and life due to lack of warning	1 year	h i g h	Sgt. Jayson Albee , Emergency Management Director, Sanpete County Sheriff's Office

S	S	Snotel Site	Flo	Many of the large canyons have a potential on a heavy snow pack year to flood.	Installation of the snotel sites would allow closer monitoring of the snow pack and allow the county and cities opportunity to mitigate potential flooding.	NRC S	Sanpete County, Forest Service, Municipalities County Wide	Grants	Unknow	Flooding of municipalities, damage to property, critical infrastructure, potential loss to life	2 years	H	Sgt. Jayson Albee, Emergency Management Director, Sanpete County Sheriff's Office
S	C	Back-up generator for pump house	Gen	Loss of commercial power would leave town short of water		Central Valley Town	None	CIB, FEMA, Local	\$25,000	Loss of water to town	2016	H	Mike Peterson, Mayor
S	G	Retention Pond Flood Control Basin Through Town	Ret	In study done by the NRCS it was determined that a flood control is needed into pipe.		Glenwood	NRCS, other Rural Development agencies, Juab County	CIB, NRCE (funding 65% of project), Dam Safety	Several Million	Prevents flood in town from four directions	Design completed in 2015, building from June-July 2016,	H	Jake Albrecht, Mayor

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Sevier Redmond Town	River	Temporary Sewer Line over Sevier River	Flood	Redmond Town Main Sewer Line crosses the Sevier River East of Town. If high water or flood, the sewer line could wash out. We would then need a method to pump sewer to the lagoon.	Obtain and install a temporary sewer line across the river on the county road bridge. Fitting and valves integrated into the existing line would be required	Redmond Town	Sevier County, Redmond Town	FEMA, CIB	\$5000 for piping and valuing (pumps already purchased)	Would prevent discharge of raw sewage into the Sevier River in the event that the high water took out our sewer line.	2016	High	Paul Christensen, Redmond Mayor
Sevier County	Watershed Program Project Waitlist	Flat Canyon Watershed Program Project Waitlist	Flood	Two major flood out of Flat Canyon this last year. These floods have impacted farmers, homes, and property in Richfield City and throughout the county. UDOT channeled water under freeway, impacting property owners		Sevier County Emergency Watershed Program Committee	UDOT, NRCS, FEMA	NRCS, FEMA, CIB	\$7.8 Million	prevent flooding of Flat canyon to prevent homes and infrastructure	2016	High	Tooter Ogden, Commissioner
Wynne Town	Cottonwood West Structure	Cottonwood West Structure	Flood	Cottonwood west intersects the highly ditch on the NE side of town. A large flood would wash out the ditch sending water toward houses and school.	Build a structure to carry flood water under the ditch	Bicknell Town, Wayne County Emergency Management	Possibly Remont Irrigation Company	Town, County, State, Federal	To be determined	Houses and high School grounds protected	to be determined	High	Gil Hunt, Mayor of Bicknell Town
Wynne Town	Sand wash and 1st East Street Structure	Sand wash and 1st East Street Structure	Flood	Sand wash crosses under 1st East Street culvert not adequate to handle large floods.	build structure or culvert big enough to handle large floods	Bicknell Town, Wayne County	Possible County Road Department	Town, County, State, Federal	To be determined	Avoid flooding houses near and south of culvert and avoid street washout	to be determined	High	Gil Hunt, Mayor of Bicknell Town

	T o w n					y E m e r g e n c y M a n a g e m e n t							
W a y n e	H a n k s v i l l e T o w n	Bridge, Water levees	F l o o d	Bull Creek Experiences Flooding	UDOT, BLM	Hanksville Town	BLM, UDOT, State CIB	BLM, CIB, UDOT	\$750,000	Decrease flooding of residences and business	Jul-16	H i g h	Lisa Wells, Clerk
W a y n e	H a n k s v i l l e T o w n	Dam Hanksville (Diversion)	F l o o d	Flooding Fremont River; 100-year Flood		Hanksville Canal Company	Wayne County, UDOT, USACE, Canal Company	FEMA, CIB	\$1 million	Agriculture, Residential Units	2017	H i g h	Lisa Wells, Clerk
W a y n e	L o a T o w n	Upgrade drainage and install bigger culverts to handle flood water on many streets in Loa Town.	F l o o d	Previous flooding issues in Loa.	Drainage that has been started on worst areas.	Loa Town	Fremont Irrigation	FEMA, CIB (grants)	\$250,000	Save lives, prevent drowning-upgrade canals this will save homes and businesses from flooding.	1st November-1st May	1	Michelle Brian, Loa Town Clerk
W a y n e	L o a T o w n	Improve Water System	S e v e r e W e a	old piping, not adequate if freezing happens	None	Loa Town	None	CIB, Division of Drinking Water, FEMA	\$300,000	flooding in homes and businesses	Fall to Spring	2	Michelle Brian, Loa Town Clerk

			ther, Flood										
Wayne Town	L o a T o w n	Hazard/Community facility (showers, kitchen)	General	None	None	Loa Town	None	CIB, FEMA (grants)	\$500,000	This building could provide temporary shelter, showers and food prep in the event of an emergency.	Anytime	3	Michelle Brian, Loa Town Clerk
Wayne Town	T o r r e y T o w n	Bridge- replace infrastructure, deliver water	Flood	creek flooding, wash out pipes, bridge (water transmission)	consultants and construction contractors, county-coordinate water resources	Wayne County Bridge- Bridge; Torrey- water delivery	State Water Resources, USFS	Federal, State, County and local	\$1.5 million	avoid cutting off residences	Jul-16	H i g h	Pat Kearney/ City Council
Wayne Town	T o r r e y T o w n	Main Street Tree Project	Severe Weather	High Velocity wind danger to main road (Highway 24)		Torrey Town	UDOT, Fed and State (FEMA, Board of water Resource)	UDOT, CIB	\$100 K	Transportation, traffic flow, water	Spring 2017	L o w	Pat Kearney/ City Council