2019 UPDATE TO
MULTI-HAZARD MITIGATION PLAN

FOR

SANDERS COUNTY, MONTANA
AND
CITY OF THOMPSON FALLS AND
TOWNS OF PLAINS & HOT SPRINGS

***Prepared for*:**

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EXECUTIVE SUMMARY

Disasters can strike at any time in any place. In many cases, actions can be taken before disasters strike to reduce or eliminate the negative impacts. These actions, termed mitigation, often protect life, property, the economy, and other values. This 2019 update to the Sanders county Multi-Hazard Mitigation Plan (MHMP) addresses the major hazards with respect to risk and vulnerabilities and supersedes the 2012 Sanders County Pre-Disaster Mitigation Plan.

A multi-disciplinary Planning Team contributed their expertise in the development of this Plan. This group represents the various local, state, tribal, and federal partners, as well as emergency responders and local industry involved in hazard mitigation in Sanders County. The Planning Team met bi-weekly between November 2018 to February 2019 to identify and prioritize the hazards profiled in this Plan and to update the mitigation strategy. This group comprises the Sanders County Local Emergency Planning Committee (LEPC) and will meet annually to discuss the MHMP, share mitigation opportunities, and collaborate on projects.

Eight (8) natural and manmade hazards are profiled in the 2019 Sanders County MHMP. They are presented below according to their prioritized rank with their ranking from the 2012 Plan listed in parenthesis:

1. Wildfire (#1)
2. Hazardous Material Incidents (#3) and Transportation Accidents (#2)
3. Severe Weather (#7, #10) and Drought (#6)
4. Flooding (#4)
5. Terrorism, Violence, Civil Unrest and Cyber Security (new hazard for 2019 MHMP)
6. Communicable Disease (new hazard for 2019 MHMP)
7. Landslide (#5)
8. Dam Failure (#11)

Each hazard is profiled in terms of a hazard description, history of occurrence, probability and magnitude, mapping (where possible), vulnerabilities to, projected variability associated with a changing climate, data limitations and other factors. Vulnerabilities to critical facilities, the general building stock, population and future development are evaluated for each hazard with loss estimates presented where appropriate.

This 2019 update to the Sanders County MHMP contains vastly improved hazard analysis based not only on the availability of 2017 U.S. Census estimates, but on a refined risk assessment methodology that utilizes a spatial structures database that was linked to parcel data to analyze building exposure. This approach is a more accurate representation of the vulnerability of the general building stock to the various hazards because structure locations are pinpointed within each parcel. A significant effort was employed to correct redundant structure values in the database in order to present a more accurate exposure analysis. The methodology for estimating at-risk population was also modified and utilizes U.S. Census estimates for the number of individuals residing in each residential structure including those under 18 years and over 65.

The 2019 Sanders County mitigation strategy was updated with input from the Planning Team. One goal was established for each hazard along with an All Hazard goal. Mitigation objectives were

updated in accordance with FEMA planning guidance to include prevention, property protection, structural, natural resource protection, public education and awareness, emergency service, and mapping/planning project types. Implementation details were established including planned activities over the next five years, and progress made was documented. The mitigation section of the Plan also discusses the county's administrative, technical and financial capabilities to perform hazard mitigation as well as the county's mitigation accomplishments.

The final section of the Plan discusses the county's approach to maintaining this MHMP to make certain it remains relevant. A process to monitor and evaluate mitigation projects has also been refined to ensure accountability and communication of mitigation successes. A commitment from the County Commissioners, Mayors, and MHMP Planning Team, will move hazard mitigation forward in Sanders County.

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

LIST OF TABLES

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ACRONYMS

AFG	Assistance to Firefighter Grant
BLM	Bureau of Land Management
CDBG	Community Development Block Grant
CDC	Centers for Disease Control
CDP	Census Designated Place
CEIC	Census and Economic Information Center
CPRI	Calculated Priority Risk Index
CRS	Community Rating System
CSKT	Confederated Salish and Kootenai Tribe
CWPP	Community Wildfire Protection Plan
DEQ	Department of Environmental Quality (Montana)
DES	Disaster and Emergency Services
DFIRM	Digital Flood Insurance Rate Map
DHS	U.S. Department of Homeland Security
DMA	Disaster Mitigation Act
DNRC	Department of Natural Resources and Conservation (Montana)
DOI	U.S. Department of Interior
DPHHS	Department of Public Health and Human Services (Montana)
EAP	Emergency Action Plan
EMPG	Emergency Management Performance Grant
EMS	Emergency Medical Services
EOC	Emergency Operations Center
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right to Know Act
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FMA	Flood Mitigation Assistance
FMAG	Fire Management Assistance Grant
FP&S	Fire Prevention & Safety
FSA	U.S. Farm Service Agency
FWS	U.S. Fish and Wildlife Service
GIS	Geographic Information Systems
HES	High Emission Scenario
HMGP	Hazard Mitigation Grants Program
IBC	International Building Code
ICS	Incident Command System
IDSA	Infectious Disease Society of America
IRC	International Residential Building Code
IT	Information Technology
LEPC	Local Emergency Planning Committee
LERD	Lands, Easements, Rights-of-way, Relocations, and Disposal
LES	Low Emission Scenario

LIST OF ACRONYMS

MBMG	Montana Bureau of Mines and Geology
MDOR	Montana Department of Revenue
MDT	Montana Department of Transportation
MHMP	Multi-Hazard Mitigation Plan
MRL	Montana Rail Link
MSU	Montana State University
NCDC	National Climatic Data Center
NDRP	National Drought Resilience Partnership
NF	National Forest
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NOAA	National Oceanic and Atmospheric Administration
NPR	National Public Radio
NRCS	Natural Resources Conservation Service
NRIS	Natural Resource Information System (Montana)
NTSB	National Transportation Safety Board
NWS	National Weather Service
OEM	Office of Emergency Management
PDM	Pre-Disaster Mitigation
PDMC	Pre-Disaster Mitigation Competitive (grants program)
RFA	Rural Fire Assistance
RFD	Rural Fire Department
SHELDUS	Spatial Hazard Events and Losses Database for the United States
SPLC	Southern Poverty Law Center
TRI	Toxic Release Inventory
USACE	U. S. Army Corps of Engineers
USBR	U.S. Bureau of Reclamation
USDA	U. S. Department of Agriculture
USDOT	U. S. Department of Transportation
USFS	U. S. Forest Service
USGS	U. S. Geological Survey
VFA	Volunteer Fire Assistance
VFD	Volunteer Fire Department
WRN	Weather Ready Nation
WUI	Wildland Urban Interface
YPL	Yellowstone Pipe Line

SECTION 1. INTRODUCTION

1.1 Background

In response to the requirements of the Disaster Mitigation Act of 2000 (DMA 2000), Sanders County, the City of Thompson Falls, and the towns of Plains and Hot Springs have developed this Multi-Jurisdictional Multi-Hazard Mitigation Plan (MHMP). DMA 2000 amends the Stafford Act and is designed to improve planning for, response to, and recovery from, disasters by requiring State and local entities to implement hazard mitigation planning and develop MHMPs. The Federal Emergency Management Agency (FEMA) has issued guidelines for development of Hazard Mitigation Plans. The Montana Disaster and Emergency Services (DES) supports plan development for jurisdictions in the State of Montana.

> ***Hazard Mitigation*** is any sustained action taken to reduce or eliminate the long-term risk and effects that can result from specific hazards.
>
> FEMA defines a ***Hazard Mitigation Plan*** as the documentation of a state or local government evaluation of natural hazards and the strategies to mitigate such hazards.

Sanders County completed a Pre-Disaster Mitigation (PDM) Plan in 2005 to help guide and focus hazard mitigation activities; however, this Plan did not meet FEMA guidelines and was therefore, not adopted. The County prepared a new PDM Plan in 2012 that was approved by FEMA and adopted by the County and incorporated communities. The County, working together with Tetra Tech Inc., has prepared this 2019 MHMP update to satisfy the requirement that hazard mitigation plans be updated every five years. The updated Sanders County MHMP profiles significant hazards to the community and identifies mitigation projects that can reduce those impacts. The purpose of the updated MHMP is to promote sound public policy designed to protect residents, critical facilities, infrastructure, private property, and the environment from natural and man-made hazards. The updated Sanders County MHMP includes resources and information to assist residents, organizations, local government, and others interested in participating in planning for natural and man-made hazards. This 2019 updated MHMP supersedes the 2012 and 2005 PDM Plans.

1.2 Authority

The Sanders County MHMP update has been developed pursuant to the requirements in the Interim Final Rule for hazard mitigation planning and the guidance in the State and Local Plan Interim Criteria under DMA 2000. The Plan also meets guidance developed by FEMA in March of 2013 for Local Mitigation Planning.

The Sanders County Board of County Commissioners have adopted this MHMP. Also adopting the Plan are the incorporated communities of Thompson Falls, Plains, and Hot Springs. These governing bodies have the authority to promote sound public policy regarding natural and man-made hazards in their jurisdictions. Copies of the signed resolutions are included as **Appendix A** to this plan. The MHMP was adopted at the regularly scheduled County Commission and City/Town Council meetings, which were open to the public and advertised through the typical process the jurisdictions use for publicizing meetings.

Sanders County will be responsible for submitting the adopted MHMP to FEMA for review. Upon acceptance by FEMA, Sanders County and the incorporated communities of Thompson Falls, Plains, and Hot Springs will remain eligible for mitigation project grants and post-disaster hazard mitigation grant projects.

1.3 Acknowledgements

Many groups and individuals have contributed to development of the Sanders County MHMP. The Sanders County Office of Emergency Management (OEM) provided support for all aspects of plan development including providing digital locations and obtaining insurance values for the critical facilities and infrastructure used in the MHMP analysis. The MHMP Planning Team, comprised of various members of the Local Emergency Planning Committee (LEPC) and other community members, met on a regular basis to guide the project, identified the hazards most threatening to the County, developed and prioritized mitigation projects, reviewed draft deliverables and attended the public meetings. The local communities participated in the planning process by attending meetings and contributed to plan development by reviewing and commenting on the draft plan.

1.4 Scope and Plan Organization

The process followed to prepare the Sanders County MHMP update included the following:

- Review and prioritize disaster events that are most probable and destructive,
- Update and identify critical facilities,
- Review and update areas within the community that are most vulnerable,
- Update and identify new goals for reducing the effects of a disaster event,
- Review and identify new projects to be implemented for each goal,
- Review and identify new procedures for monitoring progress and updating the MHMP,
- Review the draft MHMP, and
- Adopt the updated MHMP.

The MHMP is organized into sections that describe the planning process (Section 2), community profile (Section 3), risk assessment (Section 4), mitigation strategies (Section 5) and plan maintenance (Section 6). Appendices containing supporting information are included at the end of the plan.

SECTION 2. PLANNING PROCESS

The updated Sanders County MHMP is the result of a collaborative effort between Sanders County, the incorporated communities of Thompson Falls, Plains, and Hot Springs, utilities, local agencies, non-profit organizations, businesses, and regional, state and federal agencies. The planning effort was facilitated by the contractor, Tetra Tech. Public participation played a key role in development of goals and mitigation projects, as outlined below. For the purposes of this planning effort, the public is defined as residents of Sanders County, local departments, state and federal agencies that support activities in the County, neighboring communities and local partners.

2.1 MHMP Planning Team

All project stakeholders were invited to be part of the Planning Team to update the Sanders County MHMP. Stakeholders who participated on the Planning Team members are listed in **Appendix B**. The affiliation of these participants is presented in **Table 2.1-1.**

Table 2.1-1. Agencies Represented on the MHMP Planning Team

Organization / Department / Position	Type of Organization
Sanders County / Office of Emergency Management / Emergency Manager	County Government
Sanders County / Commission / Commissioner	County Government
Sanders County / Commission / Executive Assistant	County Government
Sanders County / Sheriff's Office / Sheriff	County Government
Sanders County / Land Services / Floodplain Administrator & Planner	County Government
Sanders County / Environmental Health / Sanitarian	County Government
Sanders County / Public Health / Nurse	
City of Thompson Falls / Mayor	City/Town Government
City of Thompson Falls / Council Person	City/Town Government
Town of Plains / Mayor & Floodplain Administrator	City/Town Government
Town of Hot Springs / Emergency Planning Committee	City/Town Government
Town of Hot Springs / Public Works	City/Town Government
Town of Hot Springs / Public Library	City/Town Government
Fire / Plains-Paradise Rural Fire Dept.	County Response
Confederated Salish & Kootenai Tribe / Emergency Manager	Tribal Government
U.S. Forest Service / Lolo National Forest / Wildfire Specialist	Federal Government
National Weather Service / Warning Meteorologist	Federal Government
MT Disaster & Emergency Services / Preparedness Planning Coordinator	State Government
Noxon Ambulance	Medical Response
Clark Fork Valley Hospital / Administrator	Medical
Avista Corp.	Utility / Business
Montana Rail Link	Railroad / Business
Phillips 66	Business

Responsibilities of the Planning Team included attending conference calls to discuss update of the Plan, providing data for analysis in the risk assessment, attending public meetings, providing input and feedback on mitigation strategies, reviewing the draft plan document, and supporting the plan throughout the adoption process. The MHMP Planning Team will assist the Sanders County OEM in updating the Plan in the future.

The Planning Team met five times over the course of the project; once to rank the hazards, once to review critical facility and hazard impact maps, and three other times to update the mitigation

strategy, capability assessment, and review the plan maintenance process. Planning Team conference calls were held on November 28 and December 13, 2018 and January 9 & 23 and February 6, 2019. In advance of each conference call, an agenda and/or material to be discussed (i.e. hazard maps, hazard ranking matrices, example mitigation strategies, etc.) were emailed to meeting participants. Planning Team conference call notes are presented in **Appendix B**.

2.2 Project Stakeholders

The planning process was initiated by preparing a stakeholders list of individuals whose input was needed to help prepare the MHMP. Planning partners on the stakeholders list received a variety of information during the project including meeting notices, documents for review, and the draft mitigation strategy. **Appendix B** presents the stakeholders list for this project.

On the County level, project stakeholders included: the County Commissioners, the County Attorney/Public Administrator, Emergency Manager, and representatives from the Sheriff's Office, Road Districts, Public Health, Land Services, Sanitation, Volunteer Fire Departments (VFDs)/Rural Fire Districts, Extension Agent, Information Technology, and the Superintendent of Schools. These entities participated in the planning process by either providing data, attending public meetings, participating on the Planning Team, and/or reviewing the draft MHMP.

Stakeholders from the City of Thompson Falls included the Mayor, City Council members, Clerk, Public Works Director, Police Dept., and Airport Manager. These entities participated in the planning process by either providing data, attending public meetings, participating on the MHMP Planning Team, and/or reviewing the draft MHMP.

Stakeholders from the Town of Plains included the Mayor/Floodplain Administrator, Town Council member, Clerk, Public Works Director, Police Dept., and Airport Manager. These entities participated in the planning process by either providing data, attending public meetings, participating on the MHMP Planning Team, and/or reviewing the draft MHMP.

Stakeholders from the Town of Hot Springs included the Mayor/Fire Chief, Town Council members, Planning Dept./Floodplain Administrator/Water Dept., Public Works Director, Town Clerk, Airport Manager, and Librarian. These entities participated in the planning process by either providing data, attending public meetings, participating on the MHMP Planning Team, and/or reviewing the draft MHMP.

Stakeholders from federal agencies included representatives from the National Weather Service (NWS) and U.S. Forest Service (USFS). These agencies provided data for plan development, attended meetings, participated on the MHMP Planning Team, and/or reviewed the draft MHMP.

Stakeholders from state agencies included individuals from Montana DES and Montana Dept. of Natural Resources and Conservation (DNRC). These entities were available to support the project; however, most did not attend project meetings or offer comments on the draft MHMP.

Non-governmental stakeholders including non-profits/local organizations, utilities, the media, medical facilities, and other businesses in the community. Businesses included Phillips 66, Montana Rail Link, and Avista Corp. Utilities included NorthWestern Energy. Media sources included the Sanders County Ledger. Medical facilities included Clark Fork Valley Hospital. Non-profits and local

organizations included the American Red Cross. Several of these entities attended the public meetings, participated on the MHMP Planning Team, and/or reviewed the draft MHMP update.

Planning partners from adjoining jurisdictions included emergency managers from Flathead, Lake, Mineral, and Missoula Counties in Montana and Shoshone and Bonner Counties Idaho. The emergency manager from the Confederated Salish and Kootenai Tribe (CSKT) was also invited to participate in the project. These entities did not offer input on the Sanders County MHMP update.

2.3 Review of Existing Plans and Studies

At the initiation of the project, planning documents, regulations, and studies completed for Sanders County, the incorporated communities of Thompson Falls, Plains, and Hot Springs, and the region were obtained from relevant websites and/or provided by the OEM office. The documents were reviewed in order to determine how hazard mitigation is integrated into local land use planning, ordinances, and programs. Contributing plans, regulations, and studies reviewed by the contractor included:

DAMS

- Emergency Action Plan, Noxon Rapids Dan
- Emergency Action Plan, Thompson Falls Dam
- Emergency Action Plan, Upper Dry Fork Dam
- Emergency Action Plan, Lower Dry Fork Dam
- Emergency Action Plan, Séliš Ksanka Qíispé Dam (formerly Kerr Dam, Lake County)
- Emergency Action Plan, Hungry Horse Dam (Flathead County)
- Emergency Action Plan, Hubbart Dam (Flathead County)

EMERGENCY OPERATIONS

- Sanders County Emergency Operations Plan, Hazard Specific Annexes, 2010

FLOODPLAIN STUDIES

- Flood Insurance Study, Sanders County and Incorporated Areas, 2011

GROWTH POLICIES, ORDINANCES & REGULATIONS

- Sanders County Capital Improvement Plan, 2013
- Town of Plains Growth Policy, 2014
- Town of Hot Springs Growth Policy, 2014
- Sanders County Subdivision Regulations, 2013
- Town of Hot Springs Subdivision Regulations, 2014
- Town of Plains Subdivision Regulations, 1999
- Town of Hot Springs Zoning Ordinance, 2014
- Town of Hot Springs Building Codes, 2014
- Sanders County Floodplain Regulations, 2016
- Town of Hot Springs Floodplain Regulations, 2014

HAZARD MITIGATION

- Sanders County Pre-Disaster Mitigation Plan, 2012
- Sanders County Community Fire Protection Plan, 2005
- CSKT Pre-Disaster Mitigation Plan, 2017

Data obtained from the plan and regulation review was incorporated into various sections of the MHMP. A summary of land use implementation tools is presented in *Section 3.7.1*. *Section 4.0* contains reference to the plans and ordinances affecting hazard management and future development. *Section 6.3* includes a discussion on how mitigation can be implemented through existing programs.

2.4 Project Website

A website was set up at the start of the project to provide information to the Planning Team, project stakeholders and the citizens of Sanders County. The project website can be viewed at: www.countypdm.com/ (password: Thompson Falls). The website remained active during the course of the project through adoption of the Plan.

The website contained a Home page and pages for: Contacts, Planning Team, Meetings, Draft MHMP, Maps, and References. The Home page contained a letter inviting participation in development of the Plan. The Contacts page contained information on Tetra Tech and County personnel involved in management of the project. The Planning Team page contained the meeting schedule, agendas, handouts, and notes from the Planning Team meetings. The Meetings page contained the public meeting schedule, notes, handouts and presentations from the public meetings. The Draft MHMP page contained sections from the draft plan for stakeholder review. The Maps page contained draft versions of the critical facility and hazard maps prepared for the project. The References page contained the 2012 Sanders County PDM Plan, the 2012 Sanders County Community Wildfire Protection Plan, FEMA guidance on preparing multi-jurisdictional hazard mitigation plans, the FEMA Region 8 Plan Review Guidance dated September 2011, FEMA Mitigation Ideas Handbook dated January 2013, FEMA Local Mitigation Planning Handbook dated March 2013, and links to the State of Montana Multi-Hazard Mitigation Plan and FEMA websites.

2.5 Project Meetings

Two public meetings were conducted during development of the MHMP. The first public meeting was held to kick-off the project. At this meeting, the 2012 PDM plan was reviewed and hazard events over the past five years were discussed. The second public meeting was held to review the final risk assessment and mitigation strategy and present the plan to the jurisdictions prior to adoption. Sign-in sheets, handouts, presentations, and meeting notes are contained in **Appendix B** and posted on the project website.

The first public meeting was held on November 7, 2018 at the Sanders County Court Room in Thompson Falls and in Noxon at the Avista Corp. Multi-Purpose Room. The November 1, 2018 edition of the Sanders County Ledger and November 17, 2018 edition of the Clark Fork Press newspapers published articles on the MHMP project and advertised the public meetings. A meeting notice was sent via e-mail to all project stakeholders and the meeting was posted on the project website. Media documentation is presented in **Appendix B**.

During the first public meeting, Tetra Tech made a presentation which reviewed and analyzed each section of the 2012 Sanders County PDM plan, outlined the background and rationale for updating the Plan, the process and methodology for the update, and the project schedule. **Table 2.5-1** describes the outcome of the 2012 PDM Plan review.

The meeting presentation was placed on the project website for stakeholders who could not attend the meeting (**Appendix B**). Approximately 16 individuals attended the public meeting held in Thompson Falls and seven (7) attended the meeting in Noxon. Meeting attendees included representatives from: Sanders County OEM, Public Health Dept., the County Extension Agent, the Floodplain Administrator-County Planner, a County Commissioner, representatives from the Plains-Paradise and Dixon Rural Fire Districts; the Preston-Hot Springs librarian; state and federal representatives included the U.S. Forest Service; businesses and non-profit organizations included representatives from Avista Corp. Clark Fork Valley Hospital, the American Red Cross, and Sanders County Ledger; and two members of the public.

Table 2.5-1. Review and Analysis of 2012 Pre-Disaster Mitigation Plan

2012 PDM Sections	How Reviewed and Analyzed
Section 1 - Introduction	Reviewed existing section through discussion at kick-off meeting. No analysis needed.
Section 2 - Planning Process	Reviewed and analyzed existing section through discussion during public meeting and Planning Team meetings. Reviewed and updated critical facility maps and bridges. Re-scored hazards using updated Calculated Priority Risk Index. Reviewed and updated hazards updating sections with recent hazard data.
Section 3 – Community Profile	Updated section with climate change discussion. Incorporated discussion on updated land use planning mechanisms.
Section 4 – Risk Assessment and Vulnerability Analysis	Reviewed and analyzed existing section through discussion during kick-off meeting and Planning Team conference calls. Reviewed and updated hazard profiles and analysis of building stock, critical facilities and populations. Incorporated discussion on climate change.
Section 5 - Mitigation Strategy	Reviewed by Planning Team during the course of kick-off meeting and subsequent conference calls. New projects developed, existing projects re-worded and/or deleted, completed projects documented.
Section 6 - Capability Assessment	Reviewed and analyzed existing section through discussion during public meeting and Planning Team meetings. Expanded section incorporating additional programs and funding sources.
Section 7 - Plan Maintenance Procedures	Reviewed and analyzed existing section through discussion during kick-off meeting and Planning Team conference calls. Determined that plan maintenance procedures outlined in previous plan were implemented but not documented.

A second public meeting to review the updated MHMP was held on June 4, 2019 at the Hot Springs Town Hall and on June 5, 2019 at the Sanders County Courthouse in Thompson Falls. A notice of the meeting was sent via email to the project stakeholders and advertised in the local newspapers, via social media and posted on the project website. Tetra Tech presented results of the MHMP risk assessment and updated mitigation strategy to the County and jurisdictions prior to Plan adoption. The public meeting in Hot Springs was held in conjunction with a town council meeting and was attended by nine individuals including the mayor, council members, Sanders County Emergency Manager, and several members of the public. Eight (8) individuals attended the meeting in Thompson Falls including two County Commissioners, the Emergency Manger, a representative from the County Public Health Dept., the mayor of Thompson Falls, representatives from the Montana

DNRC and U.S. Forest Service, and the local newspaper. Public meeting attendees networked before and after the meeting, listened to the presentation, and asked questions.

2.6 Plan Review

The planning process for the MHMP began on October 25, 2018 and lasted approximately seven months. The Plan update was on an accelerated schedule in order for Sanders County to qualify for funding associated with a Fire Management Assistance Grant.

The public was provided at least two opportunities for comment prior to adoption of the Plan. The first opportunity was during the drafting process. A notice was placed in the newspaper, on the project website, and communicated via social media regarding availability of the draft MHMP. The notice indicated the Plan was available in hard copy at the Sanders County OEM office, electronically on compact disk (CD) upon request, or available on the project website. An e-mail announcement was sent to the project stakeholders with instructions on how to comment on the draft MHMP. The draft document was produced with line numbers to aid in the review process. Reviewers were asked to submit their comments on the draft plan to the Sanders County OEM Director after a review period of approximately 60 days (February 28 to April 30, 2019). During this period, the draft plan was also submitted to Montana DES for their review and comment. Comments received from the first review of the draft Plan were addressed in a plan revision (final draft) which was then submitted to FEMA for review and concurrence.

During the FEMA review, the public was offered a second opportunity to review and comment on the plan. The final draft plan was posted on the project website and stakeholders were notified of its availability via an e-mail for a second review from May 1 to May 15, 2019, an approximate 15-day review period. Any final comments were addressed in a revision and the final version of the Plan was provided to the Sanders County Board of County Commissioners, the City of Thompson Falls, and the towns of Plains and Hot Springs for adoption. After adoption, copies of the resolutions were submitted to Montana DES and FEMA.

Future comments on the MHMP should be addressed to:

Sanders County Office of Emergency Management
111 Main Street
P.O. Box 519
Thompson Falls, Montana 59873
(406) 827-6955

SECTION 3. COMMUNITY PROFILE

This section of the MHMP presents an overview of Sanders County and the communities of Thompson Falls, Plains, and Hot Springs, the jurisdictions which comprise this plan. Information is provided on the characteristics of the county, the economy and land use patterns, and presents the backdrop for this mitigation planning process.

3.1 Physical Setting

Sanders County is located in Northwestern Montana. It has a land area of about 2,770 square miles (1,733,000 acres) and is bounded by Mineral and Missoula Counties to the south, Lincoln and Flathead Counties to the north, Lake County to the east, and Bonner and Shoshone Counties, in the Idaho Panhandle on the west. Sanders County is Montana's 18th most populous county with approximately 11,000 residents. Thompson Falls is the county seat and incorporated communities include Thompson Falls, Plains, and Hot Springs. The east portion of Sanders County, including the Town of Hot Springs, is within the Flathead Indian Reservation, home to the Confederated Salish and Kootenai Tribes. **Figures 1, 1A, 1B, and 1C** present location maps for Sanders County, Thompson Falls, Plains, and Hot Springs, respectively.

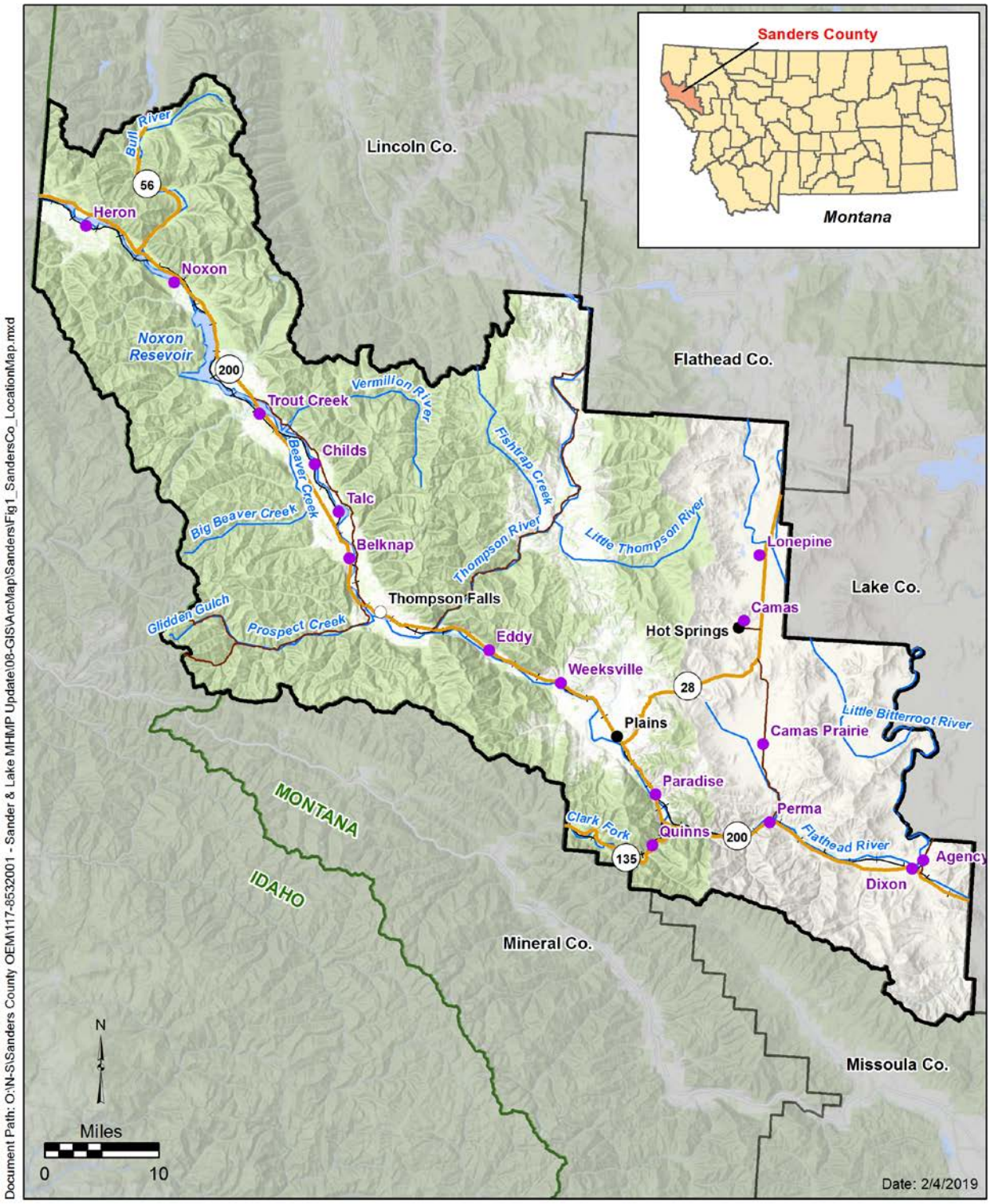
Lofty mountain ranges and broad intermontane valleys provide a wide range of topographic relief in Sanders County. Elevations in the Sanders County range from about 2,200 to 7,500 feet above sea level. The town of Heron is located on the valley floor at about 2,200 feet above sea level. Baldy Mountain, located approximately 20 miles straight-line distance northeast of Thompson Falls, is the tallest peak in the county at approximately 7,500 feet. The Bitterroot Mountains form the south boundary of Sanders County and the Cabinet Mountains are to the north. The county also encompasses the Cabinet Mountain Wilderness and the Lolo and Kootenai National Forests.

The Clark Fork River, a tributary of the Columbia River, flowing from southeast to northwest through the length of Sanders County. The Flathead River flows into the Clark Fork River downstream from Séliš Ksanka Qĺispé dam (formerly Kerr Dam), located on the southwestern tip of Flathead Lake in Lake County. Thompson Falls and Noxon Rapids dams are both located within the county on the Clark Fork River.

Landownership in Sanders County includes some very large landowners. The U. S. Government owns 52.2 percent of the land, of which is 922,235 acres is administered by the Forest Service. Indian trust land accounts for 16.5 percent or 62,827 acres. The State of Montana owns 3.2 percent of the land in and private land accounts for 26.6 percent of the ownership. Sanders County has a population density of 4.1 persons per square mile compared to 6.8 for the State of Montana. **Figure 2** displays land ownership in Sanders County and **Figure 2A** presents population density. Details on the towns in Sanders County are presented below:

Dixon - MT Highway 200 at mile post 70; 34 miles west of Missoula, MT; 123 miles east of Sandpoint, ID. Elevation: 2,523 feet. Population: 198.

Heron: MT Highway 200; 123 miles west of Missoula; 31 miles east of Sandpoint, ID. Elevation: 2,251 feet. Population: 67.



Legend

- County Seat
- Incorporated Community
- Places
- MT Highway
- Secondary Road
- Railroad
- River
- Lake/Reservoir
- County Boundary

Figure 1
Location Map
Sanders County, Montana
Multi-Hazard Mitigation Plan

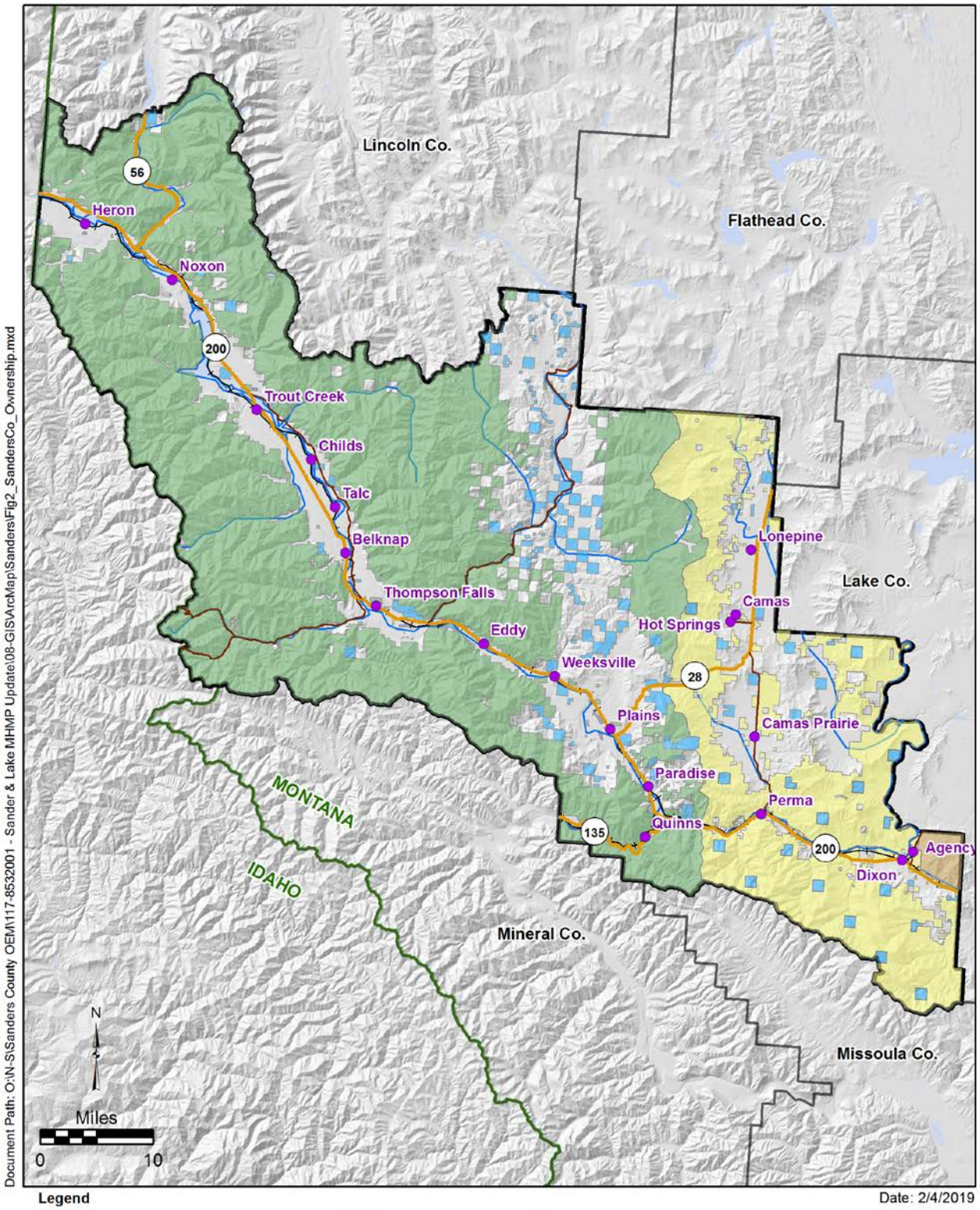


Figure 2
Land Ownership
Sanders County, Montana
Multi-Hazard Mitigation Plan

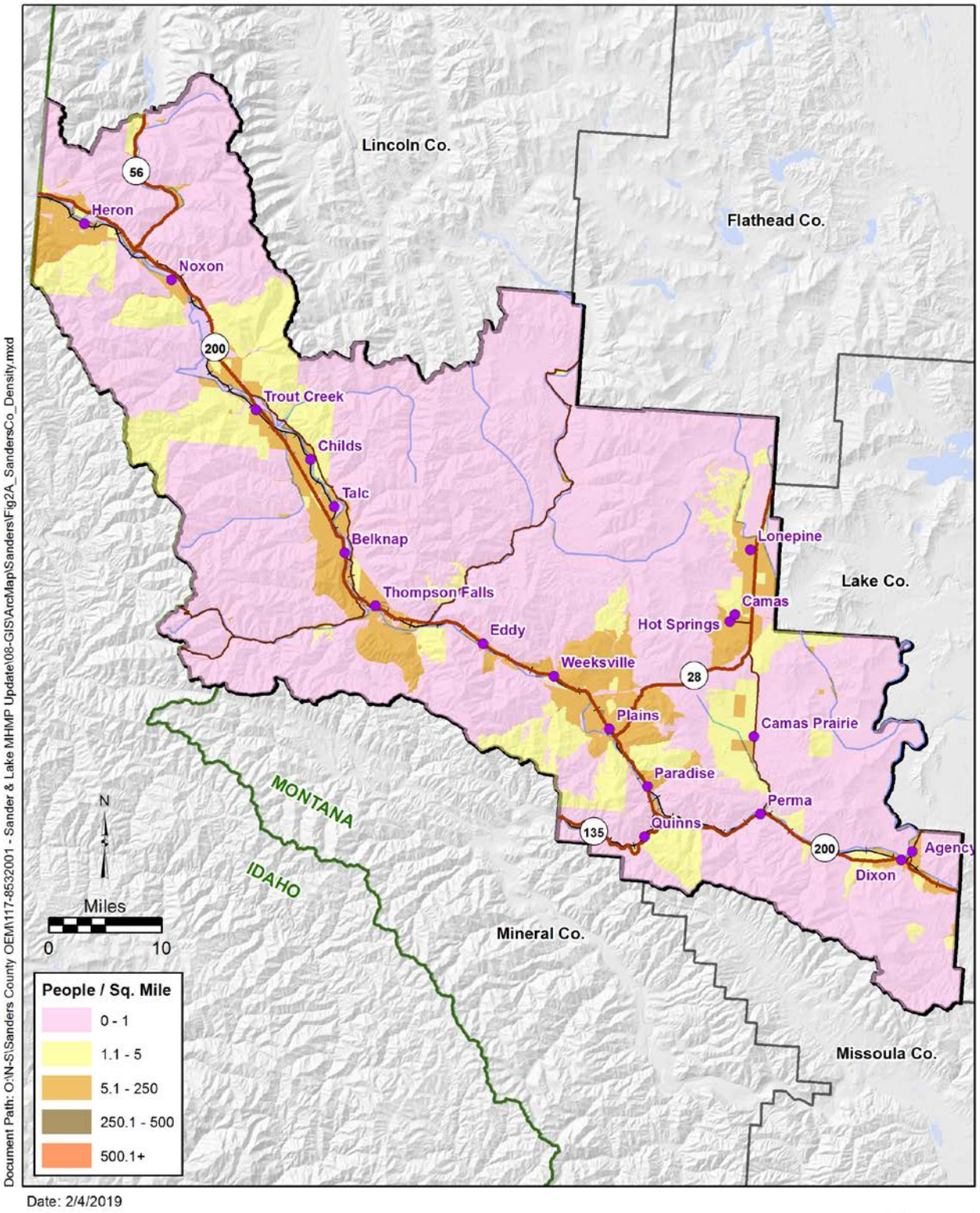


Figure 2A
Population Density
Sanders County, Montana
Multi-Hazard Mitigation Plan

Hot Springs - MT Highway 28 via Highway 200; midway between Flathead Lake and Plains; 60 miles north west of Missoula. Elevation: 2,841 feet. Population: 562.

Noxon - MT Highway 200; 115 miles west of Missoula; 41 miles east of Sandpoint, ID. Elevation: 2,185 feet. Population: 277.

Paradise - MT Highway 200; 52 miles west of Missoula, MT; 101 miles east of Sandpoint, ID; 23 miles from St. Regis & I-90; 54 miles from Flathead Lake. Elevation: 2,500 feet. Population: 170.

Plains - MT Highway 200 at mile post 70; 58 miles west of Missoula, MT; 96 miles east of Sandpoint, ID. Elevation: 2,480 feet. Population: 1,093.

Thompson Falls - MT Highway 200, Milepost 50; 81 Miles west of Missoula, MT; 73 miles east of Sandpoint, ID; 158 miles east of Spokane, WA. Elevation: 2,556 feet. Population: 1,321.

Trout Creek - MT Highway 200, 100 miles west of Missoula, MT; 60 miles east of Sandpoint, ID; 140 miles east of Spokane, WA. Elevation: 2,372 feet. Population: 291.

3.2 Climate

Western Montana, like the remainder of the northwest U.S., is heavily influenced by the predominant mid-latitude westerly flow aloft. Storm systems embedded in this flow are most frequent and potent in the winter and spring months, and with convection increasing during the warm spring, May and June are typically the wettest months.

The complex terrain also plays a big role in amount and distribution of precipitation. Uplift over the terrain causes increased amounts in the mountains, while down slope drying can greatly reduce amounts in the valleys depending on the flow direction. Therefore, the mountains in western Montana generally receive in excess of 50 inches of water equivalent precipitation annually, while the major valleys get less than 20 inches a year. The mountains along the MT-ID border in Sanders County are particularly good orographic precipitation producers with annual amounts exceeding 80 inches.

Generally, nearly half of the annual long-term average precipitation falls in the months of May, June and July. Most snow falls during the months of November through March. The majority of Montana's river flows occur during the spring and early summer months with the melting of the winter snowpack. Heavy rains during the spring thaw increase the flood threat. Rivers carry floating ice during the late winter or early spring and ice jams usually occur in March during the spring breakup. Relatively low runoff predominates the rest of the year, especially in the dry late summer, and in winter when much of the precipitation falls as snow and remains frozen. Flood flows on the Clark Fork River have been modified by dams.

Temperatures are relatively mild in western Montana compared to locations east of the Continental Divide. Arctic intrusions do occur from the north and east generally a few times every winter, but the cold air rarely lasts long due to the usually active flow from the west. During these arctic events, however, temperatures can drop well below zero. Summers can be hot in the valleys. While average highs are in the 80s in July and August, individual days often rise into the 90s and even low 100s. Table 3.2-1 presents a summary of top weather events in Thompson Falls. **Table 3.2-1** presents climate statistics for the community of Trout Creek.

Table 3.2-1. Sanders County Climate Statistics – Trout Creek

Category	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average High (^{0}F)	33	40	49	58	67	74	83	83	73	58	41	32
Average low (^{0}F)	22	23	28	32	38	44	47	46	40	34	29	21
Avg. Precipitation (Inches)	3.39	2.28	2.24	1.89	2.36	2.36	1.18	1.18	1.26	2.36	3.82	3.5
Average Snowfall (Inches)	18	8	3	0	0	0	0	0	0	0	6	21

Source: https://www.usclimatedata.com/climate/trout-creek/montana/united-states/usmt0338

For the purposes of this mitigation plan, weather is of interest when it threatens property or life and thus becomes a hazard. The NWS provides short-term forecasts of hazardous weather to the public and also records weather and climatic data. Further information on NWS weather warning criteria is presented in the individual hazard profiles in *Section 4.0*.

Climate Change

Climate change will affect the people, property, economy and ecosystems of Sanders County in a variety of ways. The most important effect for the development of this plan is that climate change will have a measurable impact on the occurrence and severity of natural hazards.

In 2017, the Montana Climate Assessment was published (Whitlock, Cross, Maxwell, Silverman, and Wade, 2017) and explored how future projected climate change would affect agriculture, forestry and water resources to better plan for the future. The CSKT Climate Change Strategic Plan (2013) was an initiative addressing the impacts of climate change on the Flathead Reservation which intended to initiate climate change impact mitigation and adaptation solutions.

The CSKT Climate Change Strategic Plan references models that predict warmer temperatures, lower snowpack, more frequent and severe droughts and floods. The following summary lists expected climate trends and potential impacts.

<u>High Certainty</u>

- Up to 5° F warmer by 2035-45
- Lower and extended low stream flow in late summer
- Earlier and greater spring runoff
- Greater likelihood of severe wildfire
- Increased spread of invasive plants and animals

<u>Medium Certainty</u>

- Up to 10° F warmer by 2075-85
- Continued declines in snowpack at lower elevations
- More pest and disease outbreaks such as mountain pine beetle

<u>Low Certainty</u>

- Decline in summer precipitation
- Increase in winter precipitation
- Greater precipitation change at higher elevations

Storm events - Climate change could increase the severity of individual storm events, even if average precipitation levels do not increase. As temperatures warm, more precipitation will fall as rain instead of snow, and more rain-on-snow events could occur. Heavy rainfall and rain-on-snow both increase the risk of flooding. Such storm events can be exacerbated by land use practices and infrastructure failures, making the impacts of flooding more severe. When rainfall occurs in a short period of time, most water runs off quickly without infiltrating soils or recharging groundwater aquifers.

Snowpack – Declines in snowpack are expected across the Rocky Mountains as temperatures increase. Because many current water storage strategies rely heavily on snowpack, a substantial strain on supplies and infrastructure could result.

Hydrology – The snow water equivalent of winter snowpack has declined, stream flow has declined (especially late summer flow), and water temperatures have increased. The time of many events, such as average freeze and thaw dates, has also changed substantially over the last 50-100 years.

Future expected trends include longer and lower summer stream flows, increasing flood risks and more precipitation falls as rain instead of snow, increasing summer stream temperatures, and declining groundwater recharge.

Wildfire - Fire severity can be expected to increase given warmer and drier conditions. An assessment of climate change and forest fires over North America projected 10-50 percent increases in seasonal severity rating over most of the U.S., implying increases in area burned and fire severity. Similarly, a 26-30 percent increase in wildfire is expected in the area, primarily in the higher elevations.

The Montana Climate Change Assessment (2017) evaluated two emission scenarios. The low-emissions scenario (LES) assumes that global emissions of the greenhouse gases that cause changes in climate conditions peak in the year 2040 and then decline. The high-emissions scenario (HES) assumes that global emissions of greenhouse gases remain largely unabated through the 21st century. Climate projections from FEMA and NOAA were analyzed by county for the State of Montana MHMP (DES, 2018). A summary of climate projections for the State and Sanders County are presented below.

Montana is projected to continue to warm in all geographic locations, seasons, and under both emission scenarios throughout the 21st century. By mid-century, Montana temperatures are projected to increase by approximately 4.5 to 6.0°F while by the end of the century, Montana temperatures are projected to increase 5.6 to 9.8°F. These state-level changes are larger than the average changes projected globally and nationally.

- From 1950 to 2006, Sanders County observed less than one day above 95 degrees each year. According to both the LES and HES, Sanders County is projected to see 5 days above 95-degrees each year by mid-century. At the end of the century, Sanders County is projected to see 8 more days above 95-degrees each year according to the LES, and 30 more days above 95-degrees each year according to the HES.

Across the state, precipitation is projected to increase in winter, spring, and fall, and decrease in summer.

- Between 1950 and 2006, Sanders County annually observed an average 4 days with more than 1-inch of precipitation. By mid-century, Sanders County is projected to see 2 fewer days with 1-inch precipitation according to the LES and HES. At the end of the century, Sanders County is projected to see 2 fewer 1-inch precipitation days according to the LES and 0.2 more 1-inch precipitation days according to the HES.

Climate change indicators provide useful information about what is occurring in complex systems. These indicators include temperature and growing season, rainfall intensity, snowpack, streamflow, stream temperature, wildland fire occurrence, plants live cycle events, and forest health. The hazard profiles in *Section 4* provide climate change implications as they relate to hazard mitigation.

3.3 Critical Facilities and Infrastructure

Critical facilities are of particular concern because they provide essential products and services that are necessary to preserve the welfare and quality of life and fulfill important public safety, emergency response, and/or disaster recovery functions. Critical facilities include: the 911 emergency call center, emergency operations centers, police and fire stations, public works facilities, sewer and water facilities, communication sites, hospitals and shelters. Critical facilities also include those facilities that are vital to the continued delivery of community services or have large vulnerable populations. These facilities may include buildings such as the jail, law enforcement center, public services buildings, senior centers, community corrections center, the courthouse, and juvenile services building and other public facilities such as hospitals and schools.

Critical facilities in Sanders County are identified in **Appendix C.** Replacement values were collected where readily available; however, time and resource constraints prohibited the collection of values for all structures. A geographic information system (GIS) layer of the critical facilities was used in the hazard risk assessment. This GIS layer should be updated on a regular basis for use in future analysis. Further details on the county's critical facilities and infrastructure from the Sanders County Capital Improvement Plan (2013), the Town of Plains Growth Policy (2014), and the Town of Hot Springs Growth Policy (2014) are presented below.

3.3.1 Water and Wastewater Services

The primary water source for the City of Thompson Falls is a series of springs located northeast of the city. The secondary source are two wells located east of the city. The City of Thompson Falls sewer system currently serves only 20 percent of its residents. The other 80 percent use individual septic systems of which most do not comply with today's treatment standards. A wastewater system improvement project is proposed that will expand the collection system to approximately 334 service connections on the west side of the north hill and abandoning existing individual septic systems and connecting individual services to the new system.

The water distribution system in the Town of Plains consists of six and eight-inch mains. The two sources of water are wells, one located near the intersection of 5th Avenue and Willis Street, and the second (Balch well) located on 4th Street, near Central Avenue. The community has a storage capacity of 500,000 gallons of water. Pressure in the water lines is approximately 85 pounds, which is adequate for all current needs, including fire hydrants. The Town of Plains' wastewater system was constructed in 1981-1982 and upgraded in 2005 and 2009. The design capacity of the wastewater

treatment plant is for 1,730 people. Some infiltration into the system is reported during high groundwater events (generally seasonal).

Three wells serve as the water source for the Town of Hot Springs. The storage facility has adequate capacity for current usage and future growth. At present, Hot Springs is not required to treat its water. Wastewater is treated in one, three-celled lagoon, and the Town has a permit to discharge effluent into Hot Springs Creek. The Town is currently pursuing a loading study to determine actual capacity of the system.

Water and wastewater for unincorporated parts of the county are provided by wells and individual septic systems.

3.3.2 Utilities

Electricity in Sanders County is provided by Northern Lights, NorthWestern Energy and Mission Valley Power. Northern Lights is a cooperative enterprise organized to bring electricity to rural areas in northern Idaho and western Montana. NorthWestern Energy was formed in 2002 when the company bought the Montana Power electric and natural gas transmission and distribution system and became partial owner of Colstrip Unit 4. Mission Valley Power is a federally-owned electrical utility operated and maintained by the CSKT. There is no natural gas in Sanders County.

The Town of Hot Springs has only one electrical feed providing electricity to the town. Essential services provided by the town would be disrupted if the substation was rendered inoperable. The town council is concerned over this vulnerability and is seeking assistance to develop a redundant system which make the community more resilient.

3.3.3 Transportation

Transportation in Sanders County is dependent on the major highways which include Highway 200 which runs from the Lake County line to the Montana/Idaho border through the majority of the communities in Sanders County; Highway 28 from the Lake County line to Plains, passing two miles from the community of Hot Springs; and, Highway 56 which runs north from the community of Heron to Lincoln County.

Sanders County has three roads districts including District #1 in Plains which maintains county roads from Plains to Thompson Falls including Cherry Creek Road; District #2 in Hot Springs which maintains county roads in the Hot Springs, Dixon and Paradise area; and District #3 with shops in Thompson Falls and Heron which maintain county roads in the west end of the county beginning west of Thompson Falls to the state line.

Sanders County has three active airports in Thompson Falls, Plains, and Hot Springs. The Thompson Falls airport completed a new fuel system in 2016 which is comparable to other Montana general aviation airports.

Rail service in Sanders County is provided by Montana Rail Link (MRL) railroad. The MRL rail line provides commercial and industrial transportation. There is no passenger rail service in Sanders County.

3.3.4 Law Enforcement and Emergency Services

The Sanders County Sheriff's Department is located in Thompson Falls and is responsible for law enforcement services throughout the county. The county detention center is also located in Thompson Falls.

Fire Services

There are four kinds of wildland fire protection agencies in Sanders County; Sanders County Fire Departments, Montana DNRC, Confederated Salish & Kootenai Tribes, Kootenai National Forest, and Lolo National Forest. Through mutual aid agreements, firefighters from each of these agencies are able to unify and assist each other with wildfires in the Valley. Every effort is made to stop wildfires before they reach housing areas, but only county volunteer departments are qualified to provide direct structure fire suppression.

Sanders County has an all-volunteer fire fighting force. There are nine fire districts and nine fire companies or departments: Dixon Rural Fire Department (RFD); Heron RFD; Hot Springs RFD; Noxon Volunteer Fire Department; Plains City Fire Department; Plains/Paradise RFD; Thompson Falls City Fire Department; Thompson Falls RFD; and, Trout Creek RFD. All fire departments train in both Wildland and Structural firefighting and maintain mutual aid agreements through the Sanders County Association of Firefighters.

Disaster and Emergency Services

The Sanders County Office of Emergency Management is the lead agency for disaster related services and coordination. The OEM Director serves as the County Fire Warden and Chair of the LEPC. OEM represents the County for disaster-related incident command functions, emergency operations planning, preparedness grant funding activities, and serves as Chair of the Local Emergency Planning Committee. Sanders County utilizes volunteers to meet many of its emergency service needs.

3.4 Population Trends

Sanders County is the 18th most populous in Montana with a population of 11,413 according to the 2010 U.S. Census. Thompson Falls, the county seat, is the state's 50th largest city, with a population of 1,313 (2010). The population of Sanders County grew dramatically from 1970 to 1980. After a decade of slight population loss from 1980 to 1990, the population in the County was once again growing with a 15.2 percent increase from 1990 to 2000 and a 10.4 percent increase from 2000 to 2010. **Table 3.4-1** illustrates the change in population in Sanders County compared to the United States and State of Montana.

Table 3.4-1. County, State and National Population Trends

Year	Sanders Co. Population	% change from previous census	State of Montana Population	% change from previous census	United States Population	% change from previous census
2017 est.	11,711	2.61%	1,050,493	6.17%	325,719,178	5.50%
2010	11,413	11.60%	989,415	9.67%	308,745,538	9.71%
2000	10,227	17.97%	902,190	12.91%	281,424,602	13.15%
1990	8,669	-0.07%	799,065	1.57%	248,709,873	9.79%
1980	8,675	22.30%	786,690	13.29%	226,542,199	11.43%
1970	7,093	3.10%	694,409	2.91%	203,302,031	13.37%

Source: U.S. Census Bureau, 2018

Table 3.4-2 presents population statistics for the incorporated communities and the Census Designated Places (CDP) within Sanders County.

Table 3.4-2. Sanders County Community Population Trends

Incorporated Community /CDP	1980	% Change Since Last Census	1990	% Change Since Last Census	2000	% Change Since Last Census	2010	% Change Since Last Census	2016/7 Est.	% Change Since Last Census
Belknap CDP	-	-	-	-	-	-	158	-	291	84.18%
Dixon CDP	-	-	-	-	216	-	203	-6.4%	198	-2.46%
Heron CDP	-	-	-	-	149	-	282	47.2%	67	-76.24%
Hot Springs, Town	601	-46.2%	411	22.6%	531	2.4%	544	2.4%	562	3.31%
Niarada CDP	-	-	-	-	50	-	27	-85.2%	10	-62.96%
Noxon CDP	-	-	-	-	230	-	218	-5.5%	277	27.06%
Old Agency CDP	-	-	-	-	95	-	107	11.2%	115	7.48%
Paradise CDP	-	-	-	-	184	-	163	-12.9%	170	4.29%
Plains, Town	1,116	-12.5%	992	11.9%	1,126	-7.4%	1,048	-7.4%	1,093	4.29%
Thompson Falls, City	1,478	-12.1%	1,319	0.2%	1,321	-0.6%	1,313	-0.6%	1,378	4.95%
Trout Creek CDP	-	-	-	-	261	-	242	-7.9%	191	-21.07%
Weeksville CDP	-	-	-	-	-	-	83	-	61	-26.51%

Notes: CDP = Census Designated Place; -- = data not available; Source: U.S. Census Bureau, 2018

Census estimates from 2016/17 show that the populations in the City of Thompson Falls and Towns of Plains and Hot Springs have increased since 2010. Census designated areas which have increased in population since the 2010 census include Belknap, Noxon, Old Agency and Paradise.

3.5 Housing Stock

The U.S. Census estimates that in 2016, Sanders County had 6,653 housing units. The median value of the occupied housing units was $183,100. A further breakdown of the housing units from the census is presented in **Table 3.6-1.**

Table 3.5-1. U.S. Census Housing Data – 2016 Estimates; Sanders County

Category	Sanders County	Thompson Falls (City)	Plains (Town)	Hot Springs (Town)
Total Number of Housing Units	6,673	575	516	380
Median Value Housing Units	$183,100	$119,800	$123,400	$83,100
Year Structure Built				
2014 or later	10	0	0	0
2010 to 2013	94	0	0	6
2000 to 2009	1,467	39	65	28
1990 to 1999	1,059	70	55	24
1980 to 1989	965	85	51	33
1970 to 1979	1,115	128	56	53
1960 to 1969	458	73	54	22
1950 to 1959	593	73	89	58
1940 to 1949	323	37	29	85
1939 or earlier	589	70	117	71

Source: U.S. Census, 2018 (American Community Survey 2012 – 2016). Notes: "-"= data not available.

The housing data shows that 70 percent of the homes in Sanders County were constructed prior to 1970.

3.6 Economy

Forestry, timber, agriculture and mining traditionally have dominated economic conditions through the history of Sanders County. The county has been one of the top timber producing counties in the State. Harvest occurs on National Forest lands, corporate timber lands, State and Tribal land and other private holdings. Agriculture enterprise is evident throughout the county ranging from traditional agriculture of crops and livestock to experimenting with new types of apples, fruit trees, and wholesale nursery products. Hydroelectric dams play a significant role in Sanders County economy. The reservoirs from several operations are significant contributors to the growing recreation and tourism industry in the county. **Table 3.6-1** presents economic indicators for Sanders County and the incorporated communities in 2016.

Table 3.6-1. Sanders County 2016 Economic Indicators

Indicator	State of Montana	Sanders County	Thompson Falls (City)	Plains (Town)	Hot Springs (Town)
Per capita income (2012-2016)	$27,309	$20,810	$19,149	$18,733	$16,571
Median household income (2012-2016)	$48,380	$34,336	$30,556	$31,667	$21,111
Persons living below poverty level	13.3%	16.4%	22.4%	24.7%	28%

Source: U.S. Census, 2018 (American Community Survey 2012 – 2016).

According to the Montana Dept. of Labor, the unemployment rate in Sanders County fluctuates seasonally and was at 10.2 percent in January 2018 and 4.5 percent in October 2018. The U.S. Census Bureau estimated that in 2016, 16.4 percent of the county population was living below the poverty level compared to 13.3 percent for the State of Montana.

3.7 Land Use and Future Development

Sanders County is predominantly a rural county. Urban development is concentrated in the incorporated communities of Thompson Falls, Plains, and Hot Springs and in a number of small towns along the Flathead and Clark Fork rivers. Thompson Falls is the largest city and most densely developed. Residential development along the Clark Fork River is increasing rapidly. Because of the steep valley walls, development generally occurs in the valley bottom which may be prone to flooding.

Land use in Sanders County is primarily agriculture (timber, crop and livestock production), with small communities and individual homes and farms interspersed. Croplands primarily produce small grains and hay. Native rangeland and planted pastures provide forage for livestock. Livestock obtain water from dugout impoundments, wells, and surface water.

3.7.1 Land Use Implementation Tools

Industrial, commercial and residential land use is managed with zoning and subdivision regulations in accordance with guidelines set forth in the County and city growth policies. These documents recognize natural hazards require regulations to ensure safe growth. Building codes also play an important role to ensure structures are built to minimum safety standards.

Growth Policies

Sanders County and the City of Thompson Falls do not have growth policies at this time. Growth policies were completed to guide land use decisions in the Towns of Plains (2014) and Hot Springs (2014). Details from these growth policies, as they apply to hazard mitigation, are summarized in the section below with further details on guidelines for future development in *Section 4.0*.

The **Town of Plains** Growth Policy discusses several hazards with the following statements.

Floodplain Areas:

- Undeveloped floodplain areas should remain undeveloped.
- No subdivision should be approved in a floodplain area determined by the Town Council to be unsuitable by reason of flooding, erosion, inadequate drainage, or impact on areas of riparian resource, or any other feature likely to be harmful to the health, safety, and welfare of the future residents of the proposed subdivision and the residents of the Plains area.
- Construction related development should be discouraged in the floodplain, wetland, and riparian areas due to possible damage from flooding and protection of water resources.
- Agricultural lands within the 100-year floodplain should remain as such in perpetuity.

Conservation, Parks, and Open Spaces:

- Areas that are unsuitable for development because of excessive slopes, of flood, fire, or other natural hazards should be preserved in their natural condition to the extent possible.
- Land areas within the Town and its extra-territorial area with a slope of greater than 15 percent should be preserved as open space due to the unsuitability of this land for development.

Natural Resources:

- Geological, topographical and floodplain limitations should be incorporated in decisions on specific land uses, including industrial and residential use.
- Geological and topographical limitations preclude the use of slopes of 15 percent or more as building sites on the northeast side of Town.
- Sites other than floodplain areas should be developed to avoid further construction in the floodplain.

The **Town of Hot Springs** Growth Policy has one goal related to wildfire, as follows:

Goal 11: Wildfire Risks Are Minimized

- Objective: Needs of local firefighting service providers are assessed to keep pace with growth. Community is informed about wildfire protection plans. The town develops an interagency Wildfire Management Plan.
- Implementation: The town and community members work with the U.S. Forest Service, CSKT, and Montana DNRC to increase wildfire preparedness.
- Indications of success: First responder teams are trained. The Town develops standards for new developments and subdivisions for wildfire protection and emergency access. There are

appropriate water flows for firefighting. There is a buffer where wildland and town areas meet for purposes of wildfire protection.

Zoning Regulations

Zoning is a tool used by local government to control and direct land use in communities, in order to protect the public health, safety and welfare. Sanders County, the City of Thompson Falls, and the Town of Plains do not have zoning ordinances. Development within the Town of Hot Springs is subject to municipal zoning regulations. Details from these regulations, as appropriate, are presented in the hazard profiles in *Section 4*.

Subdivision Regulations

Landowners wishing to subdivide tracts of land in or out of incorporated communities must follow the subdivision regulation process outlined by the 2013 Sanders County Subdivision Regulations. The City of Thompson Falls does not have subdivision regulations. The Towns of Plains and Hot Springs have adopted the State of Montana's model subdivision regulations.

Proposed subdivisions are required to complete an environmental assessment that describes various environmental features, provides responses to questions and reference materials. Required topics relevant to hazard management include the Effects on the Natural Environment and the Effects on Public Health and Safety, as described below.

Effects on the Natural Environment – Identification of possible natural hazards the subdivision could be subject to (e.g., natural hazards such as flooding, rock, snow or landslides, high winds, severe wildfires, or difficulties such as shallow bedrock, high water table, unstable or expansive soils, or excessive slopes).

- Any areas subject to flood hazard, or in delineated 100-year floodplain.
- Any existing or proposed streambank alteration from any proposed construction or modification of lake beds or stream channels.
- An evaluation of suitability for the proposed land uses including any areas with highly erodible soils or slopes in excess of 15 percent grade, unstable slopes, and expansive soils.

Effects on the Public Health and Safety – Identification of any health or safety hazards on or near the subdivision, such as: natural hazards, lack of water, drainage problems, heavy traffic, dilapidated structures, high pressure gas lines, high voltage power lines, or irrigation ditches.

- Any known hazards affecting the development which could result in property damage or personal injury due to: falls, slides or slumps -- soil, rock, mud, snow, rock outcroppings, seismic activity, or high-water table.

The subdivision regulations provide *Design and Improvement Standards* for flooding and wildfire hazards. Details from these standards are presented in the hazard profiles in *Section 4*.

Building Codes

Building codes are also a tool to control future development. The main purpose of building codes are to protect public health, safety and general welfare as they relate to the construction and occupancy of buildings and structures. They comprise a set of rules that specify the minimum acceptable level

of safety for buildings and often contain requirements for roof construction associated with snow and wind loads. Building codes are generally intended to be applied by architects and engineers, but are also used by building inspectors. Sanders County does not have a building department and as such, does not enforce building codes. The State of Montana does building inspections in Sanders County for commercial construction and residential four-plex units or larger. Building codes have not been adopted by Sanders County or the communities of Thompson Falls or Plains. The State of Montana's Building Codes are used in lieu of local codes.

The Town of Hot Springs has building codes including a Fire Prevention Code and Flood Protection Code. The Fire Prevention Code stipulates the Town of Hot Springs endorses the most recent version of the National Fire Protection Association Fire Code and violations are subject to penalty. The Flood Protection Code states that the town shall participate in the National Flood Insurance Program and adopts the most recent edition of the Flood Insurance Rate Map as the basis for determining designated floodplain areas.

Floodplain Regulations

Recurrent flooding of land resources causes loss of life, damage to property, disruption of commerce and governmental services, and unsanitary conditions. These are all detrimental to the health, safety, welfare, and property of the occupants of flooded lands. It is in the public interest to manage regulation of flood prone lands and waters in a manner consistent with sound land and water use management practices which will prevent and alleviate flooding threats to life and health and reduce private and public economic losses.

Sanders County and the Towns of Plains and Hot Springs participate in the National Flood Insurance Program (NFIP). In return for the local adoption and enforcement of floodplain management regulations that meet the minimum criteria of the NFIP, FEMA provides the availability of flood insurance coverage within these jurisdictions. The floodplain regulations regulate all construction and development in the floodplain and floodway. Uses are delineated as to which uses are permitted, permitted conditionally or prohibited and have a high degree of impact on land use decisions. The City of Thompson Falls does not participate in the NFIP because there are no areas of regulated floodplain in the municipal city limits.

3.8.2 Future Development

Sanders County is not predicted to sustain significant growth over the next 20 years. Incorporated communities are implementing infrastructure projects to accommodate growth within their city limits and a few subdivisions have been platted over the past 10 years in rural locations. *Section 4.10* presents a hazard analysis of the proposed future development projects in Sanders County.

SECTION 4. RISK ASSESSMENT AND VULNERABILITY ANALYSIS

Sanders County is exposed to many hazards both natural and man-made. A risk assessment and vulnerability analysis were completed to help identify where mitigation measures could reduce loss of life or damage to property in the County, City of Thompson Falls, and towns of Plains and Hot Springs.

This section includes a description of the risk assessment methodology and a hazard profile for eight hazards organized from high to low by county priority, as follows: wildfire; hazardous material incidents and transportation accidents; severe weather and drought; flooding; terrorism, violence, civil unrest and cyber security; communicable disease; landslide; and dam failure. The section is concluded with a risk assessment summary and discussion on future development projects. Supporting documentation is presented in **Appendix C**.

4.1 Risk Assessment Methodology

A risk assessment was conducted to address the requirements of DMA 2000. DMA 2000 requires that a vulnerability evaluation be conducted to estimate potential losses to critical facilities and property resulting from natural hazard events. In addition to the requirements of DMA 2000, the risk assessment approach taken in this study evaluated risks to vulnerable population and also examined the risk presented by several man-made hazards. The goal of the risk assessment process is to determine which hazards present the greatest risk and what areas are the most vulnerable to loss from hazard events.

The risk assessment approach used for this plan entailed using GIS software and data to develop vulnerability models for people, structures and critical facilities, and evaluating those vulnerabilities in relation to mapped hazard locations. This type of approach to risk assessment is dependent on the detail and accuracy of the data used during the analysis. Additionally, some types of hazards are extremely difficult to model. Data limitations are described in *Section 4.1.7*.

4.1.1 Critical Facilities and Building Stock

Critical facilities were mapped using coordinates provided by Sanders County. Mapping of these facilities allowed for the comparison of their location to the hazard areas where such hazards are spatially recognized. Construction type of critical facilities (e.g. steel, wood, masonry, etc.) has not been compiled and was therefore, not considered in the analysis. This data should be collected for future updates of this plan.

Infrastructure, including bridges, water and wastewater facilities, and communication sites had digital mapping available and were therefore included in the analysis. Critical facility values were obtained, where readily available, from municipal departments and insurance companies. Replacement values for privately-owned critical facilities were used in the risk assessment where this information was readily available from the Montana Dept. of Revenue's (MDOR) Cadastral Mapping Program. **Figures 3, 3A, 3B and 3C** present the location of critical facilities in Sanders County, Thompson Falls, Plains, and Hot Springs, respectively.

Bridge data was obtained from the Montana State Library, Natural Resource Information System (NRIS) and the National Bridge Inventory. Bridge replacement values were extrapolated using unit costs for span length and width. **Figure 4** presents the bridge locations in Sanders County. **Appendix C-2** presents a key to the bridge inventory. Sanders County may wish to enhance the bridge data for the 2024 MHMP update by adding the major culverts in the county.

Building stock data was downloaded from the Montana State Library, NRIS Structure Framework dataset. This dataset consists of a routinely updated database of primary structures/buildings and addresses across the state of Montana. For the hazard risk analysis, important information within this dataset includes structure type and parcel number. Structure type indicates building function, e.g., agricultural, residential, commercial, churches, schools, etc. The four structure types retained for the hazard analysis included residential, commercial, industrial, and agricultural. The dataset provides spatial locations of structures within each parcel.

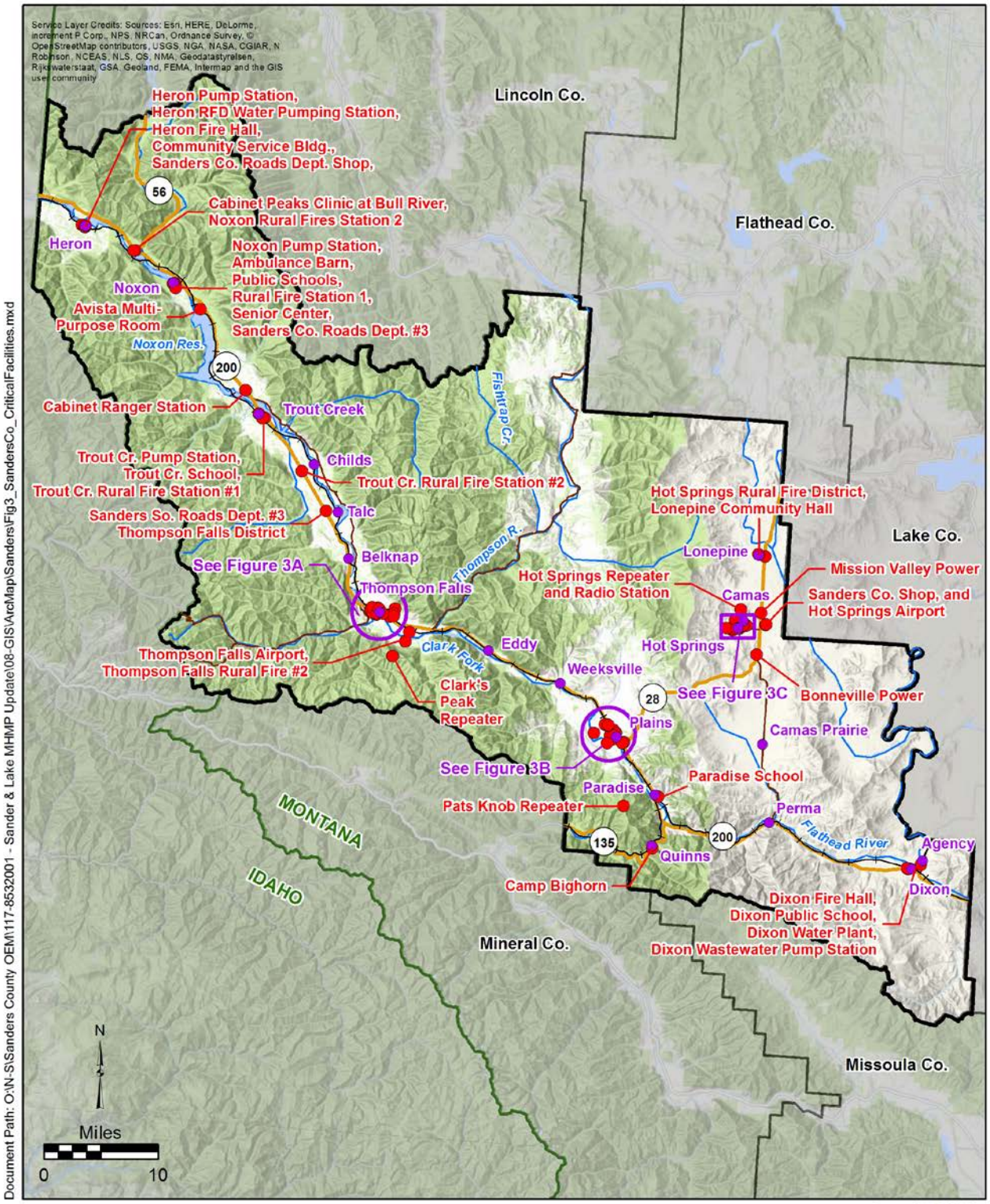
The NRIS Structures Framework dataset does not contain building values, an important factor in the MHMP vulnerability analysis. However, the dataset does contain parcel numbers which were related to the MDOR Cadastral Mapping Program dataset which contains both parcel numbers and building values. Building exposure in the risk assessment is presented for Sanders County, Thompson Falls, Plains, and Hot Springs.

4.1.2 Vulnerable Population

Using the number of residential structures in each hazard impact area, vulnerable population was estimated by assigning recent U.S. Census county estimates on number of persons residing in each structure, percent of population over age 65 years, and under age 18. The number of residential buildings within a hazard impact area was multiplied by its respective county average number of people residing in a household in Montana (U.S. Census Quick Facts). Exceptions include structures typed as "Multi-Family" residential dwellings and "Nursing Home". Multi-Family structures (e.g., apartment buildings) were estimated at 18 people and nursing homes were estimated at 40 people. Census data also provided county percentages for persons under 18 years and persons 65 years and over. These percentages were multiplied by the total population number within a hazard area to calculate people at risk under 18 and age 65 years or more.

4.1.3 Hazard Identification

The 2012 Sanders County PDM Plan (Tetra Tech, 2012) identified 11 hazards including: wildfire, railroad accidents, hazardous material incidents, flooding, landslides, drought, severe winter weather, structure fire, earthquakes, severe summer weather and dam failure. These hazards were reviewed for the 2019 MHMP by the Planning Team who considered what other hazards might be of consequence since development of the 2012 PDM Plan.



Date: 2/11/2019

Legend

- Town
- Critical Facility
- Railroad
- MT Highway
- Secondary Road
- River
- Lake/Reservoir
- County Boundary

Figure 3
Critical Facilities
Sanders County, Montana
Multi-Hazard Mitigation Plan

Document Path: O:\N-S\Sanders County OEM\117-8532001 - Sander & Lake MHMP Update\08-GIS\ArcMap\Sanders\Fig3A_ThompsonFalls_CriticalFacilities.mxd

Date: 2/11/2019

Figure 3A
Thompson Falls - Critical Facilities
Sanders County, Montana
Multi-Hazard Mitigation Plan

Legend

● Critical Facility

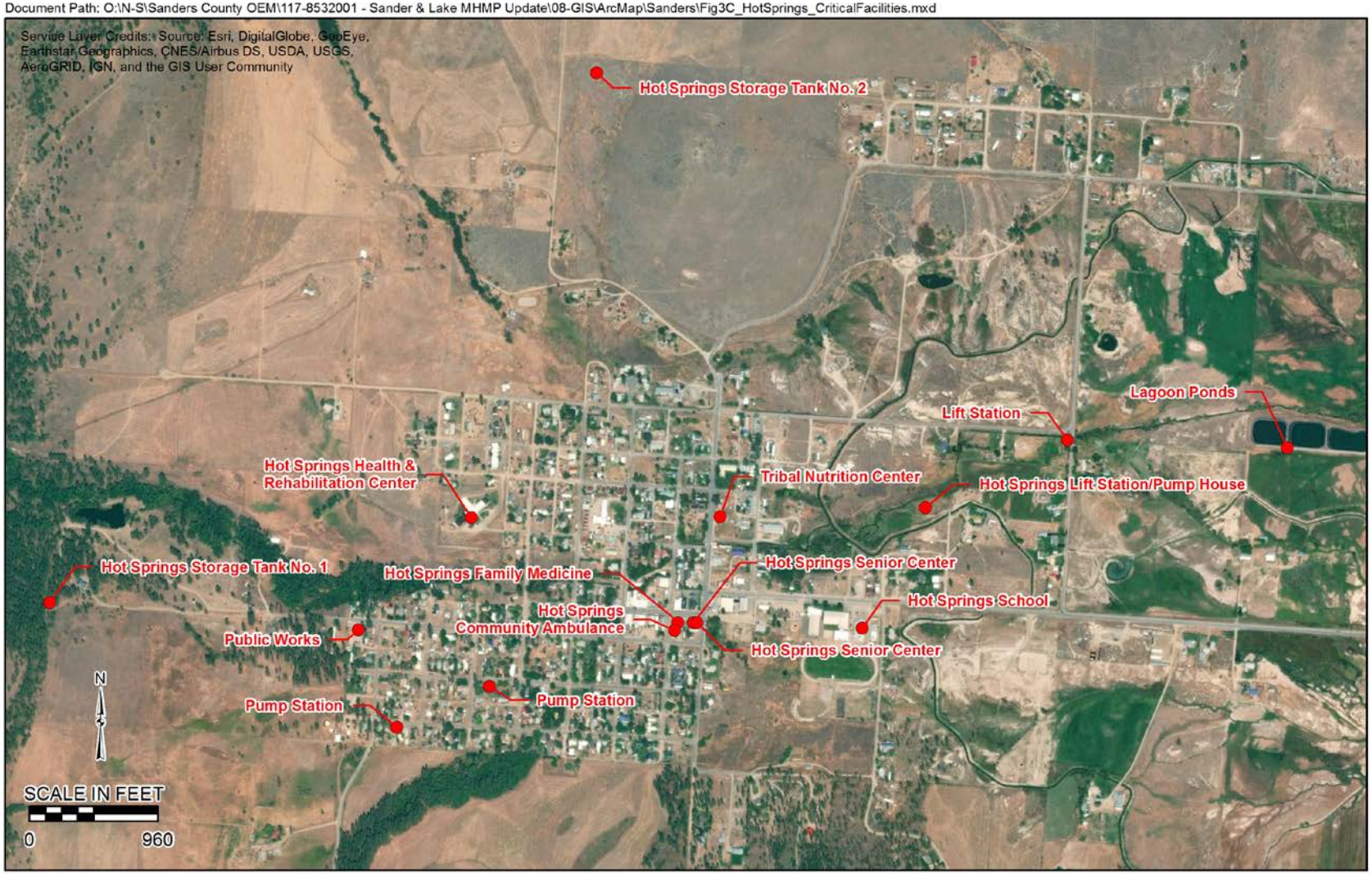
Document Path: O:\N-S\Sanders County OEM\117-8532001 - Sander & Lake MHMP Update\08-GIS\ArcMap\Sanders\Fig3B_Plains_CriticalFacilities.mxd

Date: 2/11/2019

Figure 3B
Plains - Critical Facilities
Sanders County, Montana
Multi-Hazard Mitigation Plan

Legend

● Critical Facility

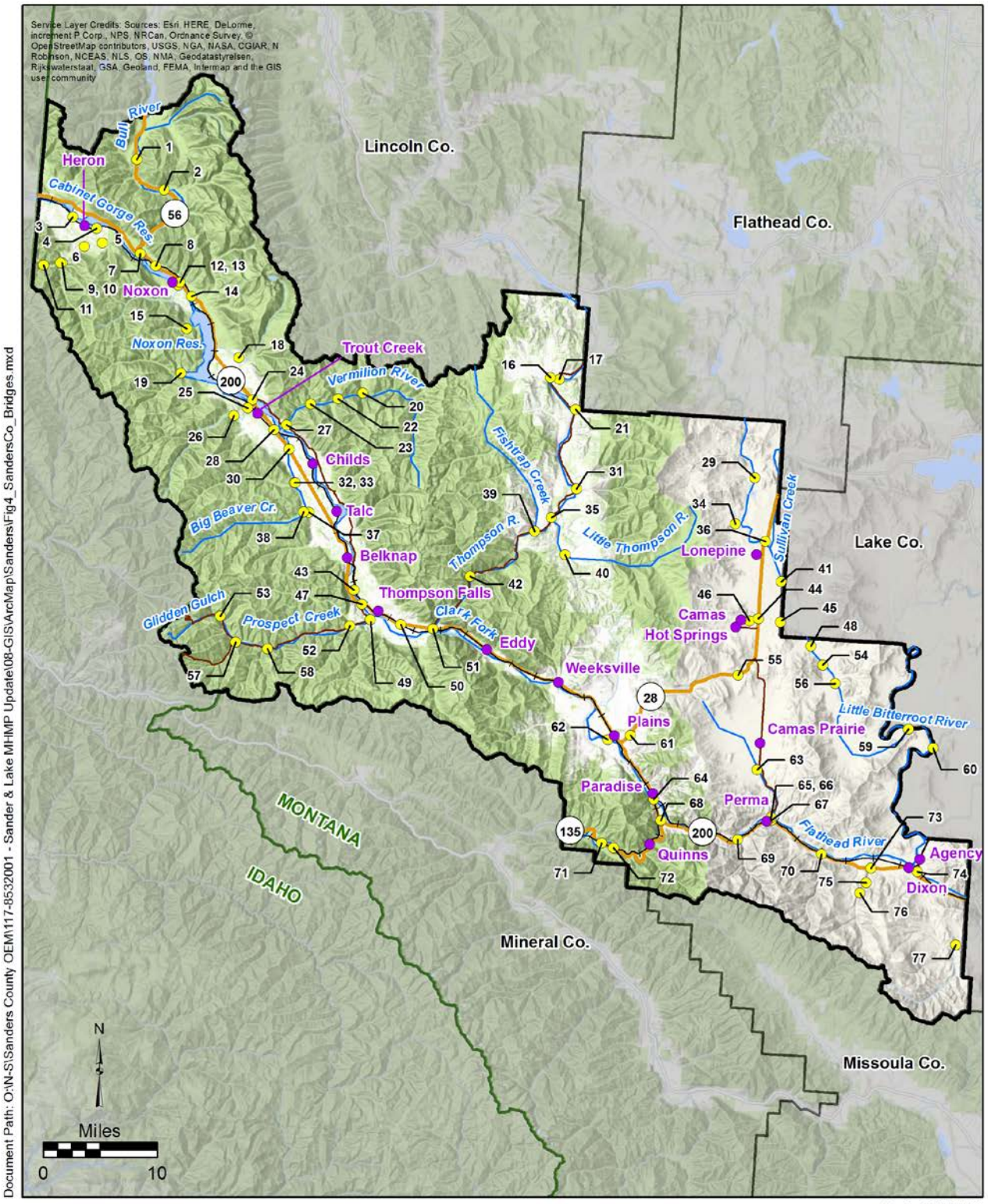


Date: 2/11/2019

Figure 3C
Hot Springs - Critical Facilities
Sanders County, Montana
Multi-Hazard Mitigation Plan

Legend

● Critical Facility



Date: 2/4/2019

Legend

- Town
- Bridge
- Railroad
- MT Highway
- Secondary Road
- River
- Lake/Reservoir
- County Boundary

Figure 4
Bridge Inventory
Sanders County, Montana
Multi-Hazard Mitigation Plan

Hazards profiled in the 2019 MHMP update include those from the 2012 PDM Plan with the following changes: drought, summer weather and winter weather are combined into a severe weather hazard profile; and, hazardous material incidents and railroad accidents are combined into one hazard profile with the profile expanded to include all transportation-related accidents. Two new hazards are profiled for the 2019 MHMP: disease and terrorism/violence/civil unrest/cyber security. The Planning Team decided that the structure fire and earthquake hazards should be de-emphasized in the 2019 MHMP because they either occur locally or don't occur with a frequency and/or magnitude to damage property or impact public safety.

4.1.4 Hazard Profiles

Hazard profiles were prepared for each of the identified hazards and are presented within this section according to their prioritized rank (see *Section 4.1.6*). The level of detail for each hazard is generally limited by the amount of data available.

Each hazard profile contains a description of the hazard and the history of occurrence, the vulnerability and area of impact, probability and magnitude, an evaluation of how future development is being managed to reduce risk, and how climate change may impact hazard probability and magnitude in the future. The methodology used to analyze each of these topics is further described below.

Description and History

A number of databases were used to describe and compile the history of hazard events profiled in this plan. This data was supplemented by input from the public, local officials, newspaper accounts, and internet research. The two primary databases used included the National Climatic Data Center (NCDC) Storm Events Database and Spatial Hazard Events and Losses Database for the United States (SHELDUS).

The NCDC Storm Events database receives storm data from the National Weather Service. The NWS receives their information from a variety of sources, including county, state and federal emergency management officials, local law enforcement officials, skywarn spotters, NWS damage surveys, newspaper clipping services, the insurance industry, and the general public. Storm Data is an official publication of the National Oceanic and Atmospheric Administration (NOAA) which documents the occurrence of storms and other significant weather phenomena having sufficient intensity to cause loss of life, injuries, significant property damage, and/or disruption to commerce.

SHELDUS is a county-level hazard data set for the United States for 18 different natural hazard event types. For each event, the database includes the date, location, property losses, crop losses, injuries, and fatalities that affected each county. The database includes every loss-causing and/or deadly event between 1960 through 1975 and from 1995 onward. Between 1976 and 1995, SHELDUS reflects only events that caused at least one fatality or more than $50,000 in property or crop damages. In order to compensate for the under-reporting of losses in general and to provide more loss-info for rural counties, SHELDUS now reports U.S. Department of Agriculture (USDA) data, which breaks down losses by floods, droughts, etc. just like the traditional SHELDUS data. However, the USDA data are all insured losses, i.e. disaster crop insurance payments (indemnity payments).

Vulnerability and Area of Impact

Vulnerabilities are described in terms of critical facilities, structures, population, and socioeconomic values that can be affected by the hazard event. Hazard impact areas describe the geographic extent to which a hazard can impact a jurisdiction and are uniquely defined on a hazard-by-hazard basis. Mapping of the hazards, where spatial differences exist, allows for hazard analysis by geographic location. Some hazards can have varying levels of risk based on location. Other hazards cover larger geographic areas and affect the area uniformly.

Probability and Magnitude

Probability of a hazard event occurring in the future was assessed based on hazard frequency over a 100-year period. Hazard frequency was based on the number of times the hazard event occurred divided by the period of record. If the hazard lacked a definitive historical record, the probability was assessed qualitatively based on regional history and other contributing factors. Probability was broken down as follows:

- Highly Likely – greater than 1 event per year (frequency greater than 1).
- Likely – less than 1 event per year but greater than 1 event every 10 years (frequency greater than 0.1 but less than 1).
- Possible – less than 1 event every 10 years but greater than 1 event every 100 years (frequency greater than 0. 01 but less than 0.1).
- Unlikely – less than 1 event every 100 years (frequency less than 0.01)

The magnitude or severity of potential hazard events was evaluated for each hazard. Magnitude is a measure of the strength of a hazard event and is usually determined using technical measures specific to the hazard. Magnitude was calculated for each hazard where property damage data was available. Magnitude is expressed as a percentage according to the following formula:

- (Property Damage / Number of Incidents) / $ of Building Stock Exposure

Future Development

The impact to future development was assessed based on potential opportunities to limit or regulate development in hazardous areas such as zoning and subdivision regulations. The impacts were assessed through a narrative on how future development could be impacted by the hazard. Plans, ordinances and/or codes currently in place were identified that could be revised to better protect future development in Sanders County from damage caused by natural and man-made hazards.

Climate Change

An essential aspect of hazard mitigation is predicting the likelihood of hazard events in a planning area. Typically, predictions are based on statistical projections from records of past events. This approach assumes that the likelihood of hazard events remains essentially unchanged over time. Thus, averages based on the past frequencies of, for example, floods are used to estimate future frequencies: if a river has flooded an average of once every 5 years for the past 100 years, then it can be expected to continue to flood an average of once every 5 years.

For hazards that are affected by climate conditions, the assumption that future behavior will be equivalent to past behavior is not valid if climate conditions are changing. As flooding is generally associated with precipitation frequency and quantity, for example, the frequency of flooding will not remain constant if broad precipitation patterns change over time. Specifically, as hydrology changes, storms currently considered to be a 1 percent annual chance event (100-year flood) might strike more often, leaving many communities at greater risk. The risks of, landslide, severe storms, extreme heat and wildfire are all affected by climate patterns as well. For this reason, an understanding of climate change is pertinent to efforts to mitigate natural hazards. Information about how climate patterns are changing provides insight on the reliability of future hazard projections used in mitigation analysis.

At the end of each hazard profile is a discussion on climate change. The information provides insight on how the hazard may be impacted by climate change and how these impacts may alter current exposure and vulnerability for the population, property, and critical facilities.

4.1.5 Hazard Ranking and Priorities

In ranking the hazards, the Planning Team completed a Calculated Priority Risk Index (CPRI) Work Sheet. The CPRI examines five criteria for each hazard (probability, magnitude/severity, economic impact, warning time, and duration); the risk index for each, according to four levels, then applies a weighting factor (**Table 4.1-1**). The result is a score that has been used to rank the hazards. Each hazard profile presents its CPRI score with a cumulative score sheet included in **Appendix C**. **Table 4.1-2** presents the results of the CPRI scoring for all hazards. The CPRI was updated since it was used in the 2012 PDM Plan to evaluate the economic impact of hazard events.

Table 4.1-1. Calculated Priority Risk Index

CPRI Category	Degree of Risk			Assigned Weighting Factor
	Level ID	Description	Index Value	
Probability	Unlikely	Rare with no documented history of occurrences of events. Annual probability of less than 0.01.	1	30%
	Possible	Infrequent occurrences with at least one documented or anecdotal historic event. Annual probability that is between 0.1 and 0.01	2	
	Likely	Frequent occurrences with at least two or more documented historic events Annual probability that is between 1 and 0.1	3	
	Highly Likely	Common events with a well-documented history of occurrence. Annual probability that is greater than 1	4	
Magnitude/ Severity	Negligible	Negligible property damages (less than 5% of critical and non-critical facilities and infrastructure). Injuries or illnesses are treatable with first aid and there are no deaths. Negligible quality of life lost. Shut down of critical facilities for less than 24 hours.	1	25%
	Limited	Slight property damages (greater than 5% and less than 25% of critical and non-critical facilities and infrastructure). Injuries or illnesses do not result in permanent disability and there are no deaths. Moderate quality of life lost Shut down of critical facilities for more than 1 day and less than 1 week.	2	
	Critical	Moderate property damages (greater than 25% and less than 50% of critical and non-critical facilities and infrastructure). Injuries or illnesses result in permanent disability and at least one death. Shut down of critical facilities for more than 1 week and less than 1 month	3	
	Catastrophic	Severe property damages (greater than 50% of critical and non-critical facilities an infrastructure). Injuries or illnesses result in permanent disability and multiple deaths. Shut down of critical facilities for more than 1 month.	4	
Economic Impact	Negligible	Little to no annual economic impact.	1	20%
	Limited	<$1 million annual economic impact.	2	
	Critical	<$1 billion but >$1 million in annual economic impact.	3	
	Catastrophic	>$1 billion annual economic impact.	4	
Warning Time	Less than 6 hours	Self-explanatory.	4	15%
	6 to 12 hours	Self-explanatory.	3	
	12 to 24 hours	Self-explanatory.	2	
	More than 24 hours	Self-explanatory.	1	
Duration	Less than 6 hours	Self-explanatory.	1	10%
	Less than 24 hours	Self-explanatory.	2	
	Less than one week	Self-explanatory.	3	
	More than one week	Self-explanatory.	4	

Table 4.1-2. Calculated Priority Ranking Index Summary; Sanders County

Hazard	Probability	Magnitude/ Severity	Economic Impact	Warning Time	Duration	CPRI Score
Wildfire	Highly Likely	Limited	Critical	<6 hours	<1 week	3.2
Dam Failure	Unlikely	Catastrophic	Catastrophic	<6 hours	<24 hours	2.90
Highway Accidents	Highly Likely	Critical	Negligible	<6 hours	<6 hours	2.85
Railroad Accidents	Possibly	Critical	Critical	<6 hours	<24 hours	2.75
Structure Fire (urban fires)	Possibly	Critical	Critical	<6 hours	<24 hours	2.75
Haz-Mat Incidents	Likely	Limited	Limited	<6 hours	<24 hours	2.60
Communicable Disease	Likely	Critical	Limited	>24 hours	>1 week	2.60
Severe Weather/Drought	Likely	Limited	Limited	<6 hours	<6 hours	2.50
Flooding	Likely	Limited	Limited	12-24 hours	>1 week	2.50
Terrorism/Violence/Civil Unrest	Possibly	Critical	Limited	<6 hours	<6 hours	2.45
Aircraft Accidents	Likely	Limited	Negligible	<6 hours	<24 hours	2.40
Severe Winter Weather	Likely	Critical	Limited	>24 hours	<24 hours	2.40
Earthquake	Unlikely	Critical	Limited	6-12 hours	>1 week	2.35
Volcanic Ash	Possibly	Limited	Limited	<6 hours	<24 hours	2.35
Landslides	Possibly	Limited	Critical	<6 hours	<6 hours	2.30
Cyber Security	Possibly	Negligible	Limited	<6 hours	<1 week	2.15
Pipeline Spills	Unlikely	Negligible	Critical	<6 hours	<6 hours	1.85

The Calculated Priority Risk Index scoring method has a range from 0 to 4. "0" being the least hazardous and "4" being the most hazardous situation.

The Planning Team felt that the CPRI ranking did not accurately represent hazard priorities for Sanders County. As such, the hazards were prioritized, and the top eight hazards profiled in this Plan. **Table 4.1-3** shows the hazard priority for the 2019 MHMP compared to how hazards were ranked in 2012.

Table 4.1-3. Prioritized Hazards for 2019 MHMP

2019 Hazard Rank	Hazard Profile	2012 Hazard Rank / Comments	Section in 2019 Plan
#1	Wildfire	#1	Section 4.2
#2	Haz-Mat Incidents & Transportation Accidents	Railroad Accidents (#2) and Hazardous Material Incidents (#3) were profiled separately in 2012 Plan.	Section 4.3
#3	Severe Weather & Drought	Drought (#6), Winter Weather (#7) and Summer Weather (#10) were profiled separately in the 2012 Plan.	Section 4.4
#4	Flooding	#4	Section 4.5
#5	Terrorism/Violence/Civil Unrest/Cyber Security	New hazard for 2019 MHMP	Section 4.6
#6	Communicable Disease	New hazard for 2019 MHMP	Section 4.7
#7	Landslide	#5	Section 4.8
#8	Dam Failure	#11	Section 4.9

The structure fire (formerly #8) and earthquake (formerly #9) hazards were deemed lower priority and are not profiled in the body of this MHMP. Their hazard profiles from the 2012 Sanders County PDM Plan are included in **Appendix C-3**.

4.1.6 Assessing Vulnerability – Estimating Potential Losses

The methodology used in the vulnerability analysis presents a quantitative assessment of the building stock, population, and critical facility exposure to the individual hazards. For hazards that are not uniform across the jurisdiction and instead occur in specific areas (e.g. wildfire, flooding, hazardous material incidents, landslide, dam failure) the hazard area factored into the loss estimation calculations. Building stock data, available from the NRIS Structures Framework and MDOR Cadastral Mapping Program was used in the analysis. Linking these two data sources enabled the location of structures within land parcels to be connected to their appraised value. When a structure had no appraised value, a county average for a home or commercial property was assigned. Using GIS, hazard risk areas were intersected with the building stock data to identify the number of structures and exposure due to each hazard. Hazard risk areas were also intersected with critical facility data (including infrastructure such as water and wastewater systems) to determine the number and exposure of critical facilities to each hazard. A separate analysis was completed for Sanders County's bridges. Using the number of residential structures in each hazard area, vulnerable population was estimated by assigning U.S. Census county estimates for number of persons residing in each structure, percent of population over age 65 years, and under age 18.

For hazards that are uniform across the jurisdiction which had documented property damage (i.e. severe weather) the methodology presented below was used to determine annualized property loss.

- Exposure x Frequency x Magnitude

Where:

- Exposure = building stock, vulnerable population, or critical facilities at risk
- Frequency = annual number of events determined by calculating the number of hazard events / period of record
- Magnitude = percent of damage expected calculated by: (property damage/# incidents)/ building stock or critical facility exposure

For hazards without documented property damage (i.e. communicable disease, terrorism), magnitude could not be calculated and therefore, only the exposure of the building stock or population was computed. Annualized loss estimates cannot be calculated without property damage using this risk assessment approach.

4.1.7 Data Limitations

Risk assessment and vulnerability analysis results are only a general representation of the potential loss that may be experienced from a hazard event and there are many inherent inaccuracies with the methodology used. Output is only as good as the data sources used and Sanders County may wish to consider alternate data for future MHMP updates.

The remainder of this section presents hazard profiles organized in general accordance with county priority followed by a risk assessment summary. Loss estimates, where applicable, are summarized at the end of this section.

4.2 Wildfire

CPRI SCORE = 3.2

Description and History

A wildfire is an unplanned fire, a term which includes forest fires, grass fires, and scrub fires, both man-caused and natural in origin. Severe wildfire conditions have historically represented a threat of potential destruction within the region. Negative impacts of wildfire include loss of life, property and resource damage or destruction, severe emotional crisis, widespread economic impact, disrupted and fiscally impacted government services, and environmental degradation.

Wildfire risk is the potential for a wildfire to adversely affect things that residents value - lives, homes, or ecological functions and attributes. Wildfire risk in a particular area is a combination of the chance that a wildfire will start in or reach that area and the potential loss of human values if it does. Human activities, weather patterns, wildfire fuels, agricultural practices, values potentially threatened by fire, and the availability (or lack) of resources to suppress a fire all contribute to wildfire risk. Varied topography, a changing climate that has resulted in less precipitation and higher temperatures, and numerous human-related sources of ignition make this possible.

Major wildfires can occur at any time of year. **Table 4.2-1** presents warning and advisory criteria for wildfire and a description of prohibitions that land management agencies can put into effect to reduce fire risk and prevent wildfires during periods of high to extreme danger.

Table 4.2-1. Warning, Advisories and Restrictions for Wildfire

Warning/Advisory/ Restriction	Description
Fire Weather Watch	A fire weather watch is issued when Red Flag conditions (see Red Flag Warning) are expected in the next 24 to 72 hours.
Red Flag Warning	A red flag warning is issued when Red Flag criteria are expected within the next 12 to 24 hours. A Red Flag event is defined as weather conditions that could sustain extensive wildfire activity and meet one or more of the following criteria in conjunction with "Very High" or "Extreme" fire danger: • Sustained surface winds, or frequent gusts, of 25 mph or higher; • Unusually hot, dry conditions (relative humidities less than 20%); • Dry thunderstorm activity forecast during an extremely dry period; • Anytime the forecaster foresees a change in weather that would result in a significant increase in fire danger. For example, very strong winds associated with a cold front even though the fire danger is below the "Very High" threshold.
Fire Warning	A fire warning may be issued by local officials when a spreading wildfire or structure fire threat ens a populated area. Information in the warning may include a call to evacuate areas in the fire's path as recommended by officials according to state law or local ordinance.
Dense Smoke Advisory	Dense smoke advisories are issued when the widespread visibilities are expected at a ¼ mile or less for a few hours or more due to smoke.
Stage 1 Fire Restriction	No building, maintaining, attending, or using a fire, campfire, or stove fire without a permit except in Forest Service developed camp or picnic grounds. No smoking unless in an enclosed vehicle or building, a developed recreation site, or while stopped in an area at least three feet in diameter that is barren or cleared of all flammable material. No operation of welding, acetylene, or other torch with an open flame. No operation or using any internal or external combustion engine without a spark arresting device properly installed, maintained and in effective working order.

Table 4.2-1. Warning, Advisories and Restrictions for Wildfire

Warning/Advisory/ Restriction	Description
Stage 2 Fire Restriction	No building, maintaining, attending or using open fire campfires or stove fires. No smoking unless in an enclosed vehicle or building, a developed recreation site, or within a three-foot diameter cleared to mineral soil. No operation of welding, acetylene, or other torch with an open flame. No operation or using any internal or external combustion engine without a spark arresting devise properly installed, maintained and in effective working order.

Source: National Weather Service (NWS, 2018); National Interagency Fire Center, 2018 (gacc.nifc.gov/.../r2ftc/documents/Fire_Restriction_Chart.pdf)

Sanders County has witnessed a number of large wildfires that have destroyed property, timber resources, scenery and air quality. Between 1986 and 2018, over 40 fires greater than 100 acres burned more than 242,598 acres in the county. The 2018 State of MT MHMP ranks the Chippy Fire in Sanders County in 2007, among the top 15 wildfires in the state at 99,090 acres. **Table 4.2-2** presents wildfire listings over 100 acres in Sanders County from the Montana DNRC and U.S. Forest Service.

Table 4.2-2. Wildfire Listings >100 Acres in Sanders County

Date	Name	Cause	Acres	Date	Name	Cause	Acres
8/10/1986	No Name	Lightning	100	7/25/2005	Baker	Equipment use	2,333
9/6/1987	Minton Peak	Other	175	7/31/2007	Chippy Creek	Undefined	99,090
10/4/1989	No Name	Lightning	200	7/18/2010	Siegel	Warming Fire	124
9/30/1993	Weeksville #2	Other	200	9/2/2012	Blacktail Ridge	Miscellaneous	300
7/1/1994	Robertson Creek	Other	765	08/01/2014	Koo Koo Sint 1	Lightning	493
7/26/1994	Henry Peak	Fireworks	8,203	08/02/2014	Spruce 2	Lightning	1,277
8/14/1994	Devil's Club #2	Lightning	800	08/21/2015	Mt. Silcox	Lightning	100
8/14/1994	Pillick Ridge	Trash Burning	500	8/14/2015	Poplar Point	Lightning	1,005
8/14/1994	Goat Rocks	Lightning	450	8/14/2015	Chippewa	Lightning	565
8/14/1994	Devil's Dad	Lightning	430	8/14/2015	Government	Lightning	376
8/14/1994	Lost Girl #2	Lightning	400	8/14/2015	Berray Mtn	Lightning	4,966
8/14/1994	Lost Girl #1	Trash Burning	200	8/13/2015	Napoleon 1	Lightning	8,967
8/14/1994	Blacktail	Powerline	100	07/30/2016	Copper King	Warming Fire	28,553
8/14/1994	South Alaska Peak	Brakeshoe	100	08/29/2017	Sheep Gap	Lightning	24,816
4/30/1995	S. Fk. Bull River	Lightning	395	08/30/2017	Deep Creek	Lightning	16,327
9/2/1998	Boyer	Pyromania	7,038	7/8/2017	Lazier Creek 3	Lightning	1,145
8/10/2000	Green Mountain	Lightning	510	8/30/2017	McCully	Lightning	607
8/10/2000	Engle	Lightning	225	08/30/2017	Cub Creek	Lightning	5,839
4/26/2001	Wilson	Slash Burning	160	08/30/2017	Miller Creek	Lightning	4,700
8/6/2003	Cherry Creek	Lightning	4,000	9/9/2017	Moose Peak	Lightning	13,887
8/19/2003	Teepee Creek	Lightning	177	8/8/2018	Hot Springs	NR	2,000

Source: DNRC, 2017; USFS, 2018; Notes: "- "indicates no data available; NR = Not Reported

State and federal wildfire disasters were declared in Sanders County including: the Clear Creek Divide Complex and Town of Hot Springs Fires (EO 18-00) and Northwest Zone 1 Fire Complex (FEMA-2320-FSA-MT) in 2000; and the Cherry Creek Fire (FEMA-2488-FM-MT) in 2003 (DES, 2018). FEMA authorized Fire Management Assistance Grants (FMAGs) in Sanders County to help with firefighting suppressing costs for the Moose Peak Fire in 2017 (FM-5211), and the Highway 200 Fire Complex (FM-5210) in 2017. Accounts of several significant wildfires in Sanders County are presented below.

Fire of 1910 - The summer of 1910 was unusually dry with fires beginning as early as June that year. Steady heat through July and August caused the forest to become extremely tinder dry. At that time,

the Forest Service was still in its infancy, and did not have the manpower to staff the Forests. Available crews were already battling many small blazes in Idaho and western Montana during the summer. Firefighters had to use pack trains to bring in crews and equipment. No major roads were yet in place, and the terrain was forested and steep. In August, strong southwest winds flamed the many small fires and turned them into raging infernos, merging small blazes into larger ones that swept through the country with unbelievable speed. Calls for help were relayed by telegraph and thousands of firefighters, homesteaders and miners fled the area for their lives to the safety of Missoula or Spokane, WA.

Scientists figured out that these incredible firestorms, which lasted two days, burned three million acres (they were stopped by a well-needed rain/snow storm). In just two days, the fires burned 4,700 square miles in northeast Washington, northern Idaho and western Montana including parts of the Bitterroot, Cabinet, Clearwater, Coeur d'Alene, Flathead, Kaniksu, Kootenai, Lewis and Clark, Lolo, and St. Joe National Forests. The fires were known to go on runs of more than 50,000 acres, and throw fire brands, that would often start new fires, 10 miles in front of the fire. The winds blew at horrific speeds, up to 80 mph and these firestorms were producing the energy equivalent to a Hiroshima-type atomic bomb exploding every two minutes. The death toll as a result of the firestorm in 1910 included 78 firefighters and 8 civilians. The amount of forest that burned was estimated to be an astounding 8 billion board feet of timber. The fires of 1910 caused drastic changes in the policy that the Forest Service had, because everything had burned, and many people had lost their lives. They turned into a complete fire suppression mode and put out any fire they could.

Cherry Creek Fire – August 2003. On August 11, strong afternoon winds caused the Cherry Creek fire to grow from 550 acres to 2,000 acres in a few hours. About 165 firefighters and four helicopters were working the fire, which was burning about 15 miles southwest of Plains and 10 miles southeast of Thompson Falls in the Cherry Creek drainage. The steep timbered terrain of beetle-killed lodgepole pine provided fuel for the fire. While the fire remained about seven miles from the nearest community, the Sanders County Commissioners issued a warning to residents in the Eddy Creek area that they should be ready to evacuate should the fire start moving down the creek. There is only one road in and one road out of the drainage. (Missoulian, *Plains Fire Grows to 2,000 Acres*, August 11, 2003).

Clark Fork Complex – August 2015. Located five miles north of Noxon, the Clark Fork Complex was a combination of six fires burning on the Idaho Panhandle and Kootenai National Forests in northern Idaho and northwestern Montana. The fire started from lightning on August 13th and required 173 firefighters to extinguish the blaze. When the fire was 75 percent contained, fire behavior was limited to interior creeping and smoldering. Pockets of large fuels continued burning and forecasted northeast winds caused occasional single-tree torching, especially on the south side of the Napoleon Fire. A shaded fuel-break along Highway 200 was completed and equipment from that area was moved to the northeast side of the Government Fire to strengthen the line along private property. Hose-lays were completed through the Ross Creek Cedars as a precautionary measure. Structure protection activities were also completed in the Eagle View Estates. Aggressive mop-up activities targeted the few remaining hot-spots along the Highway 56 corridor. Over 15,744 acres were consumed in the blaze. (NPR News, *Montana Wildfire Roundup*, September 4, 2015).

Chippy Fire - July 2007 - The Chippy Creek Fire started Montana DNRC State Trust Lands. The cause of this fire was not determined. The fire started on July 31, 2007 and burned from the west, 10 miles

east across the Cabinet Mountain range, then spread 15 miles north and south, consuming a total of one hundred and fifty square miles. The Chippy Creek Fire burned over 99,000 acres and had a total suppression cost at close to $5 million.

Highway 200 Fire Complex – 2017. The Highway 200 Complex fires were located near the towns of Thompson Falls and Plains. The Sheep Gap fire was approximately two miles west of Plains. The remaining fires (Cub Creek, Readers, Deep Creek, and Miller Creek) were located eight miles north and west of Thompson Falls. The fires threatened 925 homes and businesses in and around Plains as well as buildings, power transmission lines, telephone transmission lines, cellular towers, Conoco Phillips Gas pipeline, buildings, equipment and the Clark Four River watershed in the area. The fire started on August 30, and burned in excess of 50,000 acres of federal, state and private land. The Sanders County Sheriff's Office conducted evacuations on Swamp Creek Road, Glades Ranch, Cat Track Lane to Mountain subdivision and the residences between south of Blackjack Road, and Foothill Lane. More than 300 firefighters were assigned to the incident. https://www.fema.gov/news-release/2017/09/10/fema-authorizes-funds-help-fight-highway-200-complex-fire-sanders-county

In Sanders County there are three wildland fire protection entities: the U.S. Forest Service, Montana DNRC, and the CSKT Division of Fire. These entities and coordination with the seven Rural Fire Districts and three city fire departments provides for efficient wildland fire protection in Sanders County. The Montana DNRC has primary responsibility for fire protection on all private and State lands within Sanders County. They have a reciprocal agreement with the Forest Service where both agencies exchange blocks of land for fire protection purposes. In the agreement, the state agrees to protect an agreed upon number of acres of federal land in exchange for the Forest Service protecting acres of private land within the forest boundary.

Sanders County updated their Community Wildfire Protection Plan (CWPP) in 2012. This document is presented in **Appendix E**. Mitigation projects identified in the CWPP are incorporated herein by reference. MHMP Planning Team members indicated that the CWPP will be updated again soon because recent fires that have changed foliage types in drainages and will require updated fuel modeling.

Vulnerability and Area of Impact

One of the primary concerns during a wildfire event is for the safety of the community's residents. Other concerns include the threat to homes, structures, fences, power lines, communication sites or other infrastructure, and firefighter safety. Homes are often located at the forest edge or in the forest itself; built out of flammable materials (wood siding and other flammable materials); constructed near the end of gulches with only one escape route or on steep hillsides with narrow, winding roads; and built on lands without adequate water. While the site or building material may be chosen for its aesthetic merit, it often has few or none of the qualities essential for the safety of both the home and its occupants in the event of a fire. Should fires occur, these structures within the wildland-urban interface (WUI) are very vulnerable.

The WUI is defined as the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. A WUI exists anywhere that structures are located close to natural vegetation and where a fire can spread from vegetation to

structures, or vice versa. A WUI can vary from a large housing development adjacent to natural vegetation to a structure or structures surrounded by vegetation. As people, homes, and structures continue to occupy the WUI and as hazard fuels continue to accumulate, a high risk and volatile situation results.

According to the Sanders County CWPP (2012), many homes in the WUI do not have ingress/egress suitable for fire protection vehicles or alternate access for evaluation. Bridges are inadequate; roads can be too narrow or too steep and may not be plowed in the winter; and turn-around space near residences may be inadequate to accommodate the emergency vehicles. Often, landowners are not aware of these problems until they need protection assistance.

Fires originating in relatively remote areas can be driven by winds for long distances in a short time. The east-west orientation of many of the drainages in the County coupled with the prevailing westerly winds and the historic lightning patterns often support fires that start on state, federal, and tribal forest lands, and when the conditions are right, move into the WUI where they may threaten private property.

Tens of thousands of acres of fuel treatment have occurred on private, state, and federal lands over the past decade but there is much more to do. One study done by the Montana DNRC and the U.S. Forest Service estimated over 162,000 acres of high-risk forested areas within the County's interface need some kind of treatment to adequately lower fire risk and protect area residents. Once treated, regular maintenance is necessary to maintain the conditions that contribute to lower fire risks (CWPP, 2012). The 2018 Montana MHMP lists Sanders Co. as having the 6th highest wildfire exposure amongst Montana's 56 counties.

Smoke from wildfires has the potential to impact Sanders County residents. Health effects associated with forest fire smoke exposure has been studied by the Centers for Disease Control (CDC). Researchers found the risk of hospital admission for respiratory and circulatory illness was greater during periods of heavy smoke than unexposed areas (CDC, 2001). Smoke blows into Sanders County from the west and Canada. The Montana Dept. of Environmental Quality (DEQ) sends health warnings to schools on hazardous smoke conditions recommending the suspension of athletic events. Smoke also affects things like road safety and tourism.

Wildfires dramatically change landscape and ground conditions, which can lead to increased risk of flooding during heavy rains because the burned ground is unable to absorb the falling rain, producing runoff conditions. Because of this, even modest rainstorms over a burned area can result in flash flooding downstream. Further discussion on this issue is presented in *Section 4.5 - Flooding*.

Probability and Magnitude

The history of wildfires, the terrain, and insect infestations has prompted Sanders County to identify wildfire as a significant hazard. Smoke from fires both within and outside of the County can create poor air quality. Sensitive groups, such as the elderly and residents with respiratory illness can be affected.

Major wildfires can have a tremendous financial impact in any community. Local businesses frequently suffer major losses, particularly when wildfires occur during the peak tourist season. Picturesque views of the forested landscapes and recreational opportunities offered by the forest are

important reasons people live in and visit Sanders County. A wildfire will impact the aesthetics of the area which can further impact property values and economic activity.

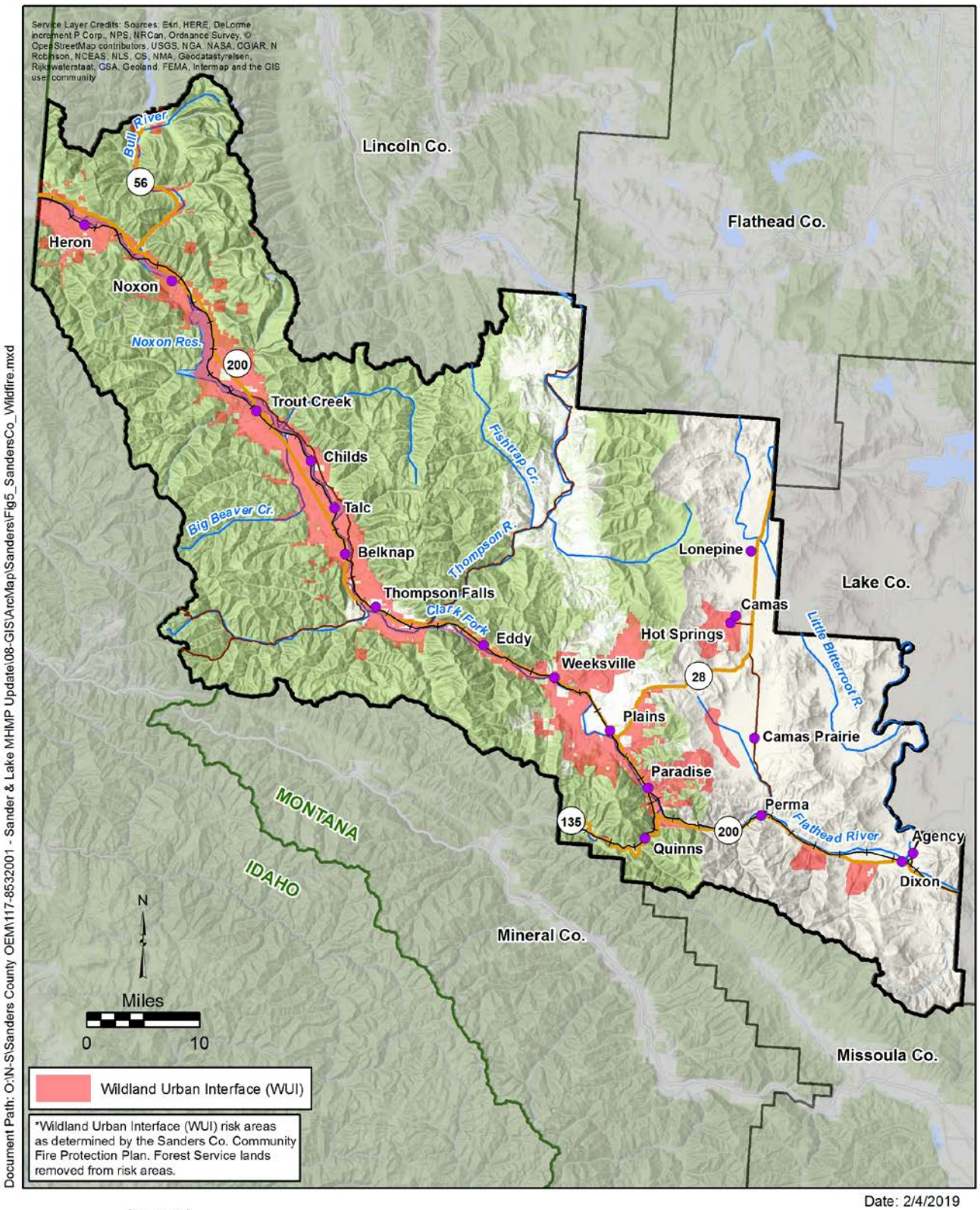
Although the primary concern is to structures and the interface residents, most of the costs associated with fires, come from firefighting efforts. As past events have also shown, infrastructure such as power transmission lines and communication towers can also be threatened.

Wildfire does not present a uniform risk across Sanders County with regards to structures. As such, the area of impact used in the MHMP analysis consisted of the WUI layer from the 2012 Sanders County CWPP. The WUI was identified as specific areas at risk from wildfire by rural, state, tribal, and federal agencies with fire protection responsibilities in Sanders County. Once identified these areas were tied into the WUI boundary as established by the Healthy Forest Restoration Act. The WUI boundary extends two miles beyond clusters of private, non-corporate land with known structures. The municipalities of Thompson Falls, Plains, and Hot Springs were not included in the analysis even though they are within WUI boundaries because sufficient fuel breaks surround them to put them at a lower risk of wildfire incursion. Heron, Noxon, and Trout Creek were treated as a part of the WUI. **Figure 5** presents the wildfire hazard impact area used for the MHMP analysis.

To complete the vulnerability analysis for this project, GIS was used to intersect the wildfire hazard area with the building stock and critical facility datasets. Vulnerable population was calculated using U.S. Census county estimates. Exposure values are presented in **Table 4.2-3**. Building exposure reflects only the monetary structure value and does not account for improvements or personal effects that may be lost to wildfire.

Table 4.2-3. Sanders County Vulnerability Analysis - Wildfire

Category	Sanders Co. (balance)	Thompson Falls (city)	Plains (town)	Hot Springs (town)
Residential Property Exposure $	$335,191,155	$0	$0	$0
# Residences at Risk	2,615	0	0	0
Commercial, Ag & Industrial Property Exposure $	$223,710,121	$0	$0	$0
# Commercial, Ag & Industrial Properties at Risk	1,273	0	0	0
Critical Facilities Exposure Risk $	$27,232,422	$0	$0	$0
# Critical Facilities at Risk	26	0	0	0
Bridge Exposure $	$51,708,800	$0	$0	$0
# Bridges at Risk	35	0	0	0
Persons at Risk	3,506	0	0	0
Persons Under 18 at Risk	1,179	0	0	0
Persons Over 65 at Risk	2,032	0	0	0



Legend

- Town
- Critical Facility
- Railroad
- MT Highway
- Secondary Road
- River
- Lake/Reservoir
- County Boundary

Figure 5
Wildfire Hazard Area
Sanders County, Montana
Multi-Hazard Mitigation Plan

GIS analysis of the wildfire risk to Sanders County indicates that 200,473 acres (11.2 percent) are within the wildfire hazard impact area. According to the vulnerability analysis, 2,615 residences, 1,273 commercial/agricultural and industrial buildings, and 26 critical facilities are at risk to wildfire in Sanders County. The *Wildfire* section in **Appendix C-2** lists the critical facilities and bridges within the wildfire hazard area.

Wildfires generally occur more than once per year in Sanders County and therefore, the probability of future events are rated as "highly likely".

Future Development

The Sanders County Subdivision Regulations include Design Standards for fire protection and special requirements for subdivisions proposed in areas of high fire hazard, as summarized below.

Fire Protection

All subdivisions must be planned, designed, constructed, and maintained so as to minimize the risk of fire and to permit the effective and efficient suppression of fires in order to protect persons, property, and forested areas. Measures must include:

- The placement of structures so as to minimize the potential for flame spread and to permit adequate access for firefighting equipment.
- The presence of adequate firefighting facilities on site, including an adequate water supply and water distribution system to fight fires.
- The availability, through a fire protection district or other means, of fire protection services adequate to respond to fires that may occur within a subdivision.

Special Requirements for Subdivisions Proposed in Areas of High Fire Hazard

For areas identified as high wildfire hazard areas by the USFS, the MT DNRC, a local fire protection authority, or in a local policy, the following apply:

- A Fire Prevention and Control Plan shall be required with the submission of any application for preliminary plat approval.
- The Fire Prevention and Control Plan shall include the following items:
  - An analysis of the wildfire hazards on the site, as influenced by existing vegetation and topography;
  - A map showing the areas that are to be cleared of dead, dying, or severely diseased vegetation;
  - A map of the areas that are to be thinned to reduce the interlocking canopy of trees;
  - Identification of roads, driveways, and bridges sufficient for emergency vehicle access and fire suppression activities. Slopes for all roads and driveways must be provided.
- At least two entrance-exit roads must be provided to assure more than one escape route for residents and access routes by fire fighting vehicles. Bridges must be built to a design load of 20 tons and must be constructed of non-flammable materials. Road rights-of-way must be cleared of slash.

- Building sites must be prohibited on slopes greater than 25 percent and at the apex of "fire chimneys" (topographic features, usually drainageways or swales, which tend to funnel or otherwise concentrate fire toward the top of steep slopes).
- The Fire Prevention and Control Plan shall be implemented before approval of the final plat and shall be considered part of the subdivider' s obligations for land development. The local fire chief, or designee, shall inspect and approve the implementation of the Fire Prevention and Control Plan. The Plan shall not be considered fully implemented until the fire chief has given written notice to the subdivision administrator that the Plan was completed as approved by the Sanders County Commissioners.
- In subdivisions or planned unit developments, provisions for the maintenance of the Fire Prevention and Control Plan shall be included in the covenants, conditions, and restrictions for the development. A homeowners' association shall be formed and named as a beneficiary of such covenants, conditions, and restrictions.
- Open space, park land, and recreation areas (including green belts, riding or hiking trails) should be located, where appropriate, to separate residences and other buildings from densely forested areas.
- A water supply of sufficient volume for effective fire control must be provided in accordance with standards set by the fire district in which the project is located.

In the absence of such standards, the subdivider must at least provide the following for effective fire control:

- A central water system with a minimum flow of 1,000 gallons per minute;
- Where no central water system exists, cisterns, reservoirs or fill ponds must be provided at appropriate locations:
  - For single dwelling units: minimum capacity of 2,500 gallons;
  - For 6 or more dwelling units: minimum capacity of 500 gallons per dwelling unit.

Climate Change

Montana has been on a steady warming trend for decades, up over 3 degrees F since 1950, and all projections are that it will continue. The summer of 2017 was the second warmest on record since 1950 at 4 degrees F above average, and the persistent high temperatures coupled with the record lowest rainfall in July and August shifted the relatively wet conditions of spring into extreme drought by mid-summer followed by a severe wildfire season (Whitlock et.al., 2017).

The climate future with respect to wildfire will include additional warming with less precipitation in the summer months which set the stage for drier conditions and more fires. Over the next century, extreme heat days (above 90 degrees F) are projected to increase by an additional 5-35 days across the state. And, as a result of greater drought, forest fires will likely increase in size, frequency, and possibly severity.

In a given year, warmer weather and less precipitation dries out fuel loads and creates conditions for rapid fire spread. Fire records dating back decades to millennia show a clear link between warmer temperatures, lower precipitation and an increase in the number of fires and acres burned. Since 1986, wildfire seasons are nearly 80 days longer, with increases in large fires and fires burning up to 10,000 feet in elevation (Whitlock et.al., 2017).

Larger, more severe, and more frequent fires may impact the people, property and critical facilities by increasing the risk from ignition from nearby fire sources. Climate change also may increase winds that spread fires. Faster fires are harder to contain, and thus are more likely to expand into residential neighborhoods.

Secondary impacts, such as air quality concerns and public health issues, will likely increase due to smoke from wildfire. Wildfire smoke generates a lot of particulate matter 2.5 microns or less in diameter. Those particles are so small, they easily bypass most of the human body's defenses and move directly from the lungs into the bloodstream. A recent study demonstrates that smoke waves are likely to be longer, more intense, and more frequent under climate change, which raises health, ecologic and economic concerns.

4.3 Hazardous Material Incidents and Transportation Accidents

CPRI SCORES:
HIGHWAY ACCIDENTS = 2.85
RAILROAD ACCIDENJTS = 2.75
HAZ-MAT INCIDENTS = 2.60
AIRCRAFT ACCIDENTS = 2.40
PIPELINE SPILLS = 1.85

Description and History

Hazardous material incidents in Sanders County are rare but when they do happen, are often associated with the county's highways, railroads, and/or pipelines. Hazardous material incidents also occur at fixed facilities which in Sanders County include bulk propane and agricultural chemical distributors, gas stations, lumber mills, hydroelectric dams, and/or mining-related facilities. Transportation accidents can occur on the highways, railroad, or in the air and often result in fatalities and injuries but rarely in property loss unless hazardous materials are involved. Because of the potential for future incidents involving hazardous materials on the transportation corridors in Sanders County these two hazards are profiled together.

Hazardous Material Incidents

A hazardous material release is the contamination of the environment (i.e. air, water, soil) by any material that because of its quantity, concentration, or physical or chemical characteristics threatens human health, the environment, or property. Hazardous materials, including petroleum products and chemicals, are commonly stored and used in Sanders County and are regularly transported via the region's roadways, railroads, and through pipelines. A release of hazardous materials from both fixed and transportation incidents pose possible threats involving emergency response. Hazards range from small spills on roadways to major releases from railways or pipeline spills that contaminate land and water.

Hazardous material incidents in Sanders County have mostly been minor. Records of hazardous material events from 1990 to 2018, available from the National Response Center database, are summarized in **Table 4.3-1**.

Table 4.3-1. Sanders County Hazardous Material Incidents; 1990 – 2018

Incident Date	Type of Incident	Incident Cause	Location	Nearest City	Suspected Responsible Party	Material Spilled
11/22/1991	Railroad	TA	MP 46	Thompson Falls	Montana Rail Link	Asphalt
8/8/1992	Fixed	UK	Thompson Falls Reservoir	Thompson Falls	Montana Power Co.	Motor Oil
1/14/1993	Pipeline	EF	-	Hot Springs	YPL	Diesel Oil
3/10/1994	Fixed	UK	Montana Power Access Rd	Thompson Falls	Stone & Webster- Kiewit	Hydraulic Oil
2/9/1996	Railroad	NP	-	Noxon	Montana Rail Link	No. 2-D Fuel Oil
4/9/1996	US	UK	Between McKay & Rock Creek	Drought Creek	-	Unknown Material
4/11/1996	Railroad	UK	4th Sub-Division	Noxon	Montana Rail Link	Diesel Oil
7/31/1998	Fixed	Other	Hot Springs Sub Station	Hot Springs	Bonneville Power Admin	Mineral Oil
2/9/1999	Fixed	EF	TFalls Hydroelectric Plant	Thompson Falls	Montana Power Co.	Hydraulic Oil
4/22/1999	Fixed	EF	TFalls Hydroelectric Plant	Thompson Falls	Montana Power Co.	Lubricating Oil
7/11/1999	Railroad	Other	Unknown	Paradise	Montana Rail Link	Asphalt
11/23/1999	Fixed	Other	Spruce Street	Thompson Falls	-	Unknown Material
5/23/2000	Railroad	EF	TFalls Power House Maiden Ln	Thompson Falls	PPL Montana	Hydraulic Oil
6/29/2000	Fixed	EF	TFalls SW of Maiden Ln	Thompson Falls	PPL Montana	Lubricating Oil
3/1/2002	Fixed	Other	609 West 3rd Street	Plains	Town of Plains	Raw Sewage
7/13/2003	Fixed	EF	Hydro-Electric Facility	Thompson Falls	PPL Montana	Lubricating Oil
10/31/2003	Railroad	DR	MP 211 MRL 4th Subdivision	Quinn	Montana Rail Link	Diesel Oil

Table 4.3-1. Sanders County Hazardous Material Incidents; 1990 – 2018

Incident Date	Type of Incident	Incident Cause	Location	Nearest City	Suspected Responsible Party	Material Spilled
11/13/2006	Railroad	DR	Bridge 57 Clark Fork River	Trout Creek	Montana Rail Link	Coal
4/24/2007	US	UK	Hwy 200 West of Dixon	Dixon	-	Unknown Oil
7/17/2008	Mobile	OE	Beaver Creek Bridge	Thompson Falls	Sanders County	Road Sealer
10/1/2008	Fixed	EF	1625 Maiden Lane	Thompson Fall	PPL Montana	Hydraulic Oil
2/26/2009	Fixed	EF	Avista Hydroelectric Plant	Noxon	Avista Utilities	Mineral Oil w/ PCBs
7/2/2009	Mobile	UK	Clark Fork River	Plains	-	Septic Tank Sludge
10/26/2009	ST	OE	4 Corners Pine 11 Timber Ln	Trout Creek	Vinson Lumber	Used Oil
2/7/2010	Mobile	Other	TFalls Dam Clark Fork River	Thompson Falls	C.O.P. Construction	Hydraulic Oil
7/13/2011	Fixed	UK	885 Prospect Creek Rd	Thompson Falls	-	Radioactive Material
6/29/2012	Fixed	UK	BN Tie Plant	Thompson Falls	AECOM	43 lbs Creosote
2/17/2014	Fixed	EF	BN Tie Plant	Paradise	BNSF Railway Co.	2 Qts. Creosote
6/14/2014	Fixed	EF	TFalls pump station on YPL	Thompson Falls	Phillips 66	Diesel Oil
2/29/2016	Fixed	EF	BN Tie Plant	Paradise	BNSF	5 gal. Creosote
9/27/2016	Mobile	OE	Boat Ramp	Trout Creek	Private Citizen	Battery Acid

Source: National Response Center, 2018 (http://www.nrc.uscg.mil/).
Notes: DR = Derailment; EF = Equipment Failure; NP = Natural Phenomenon; OE = Operator Error; ST = Storage Tank; TA = Transportation Accident; UK = Unknown; US = Unknown Sheen

In addition to the hazardous material incidents listed above, the MHMP Planning Team recalled a hazardous material incident in nearby Mineral County in 1996, that is described below.

April 11, 1996. Nineteen (19) cars from a Montana Rail Link (MRL) freight train derailed near Alberton in Mineral County. Six of the derailed cars contained hazardous materials. One derailed tank car containing chlorine (a poison gas) ruptured, releasing 130,000 pounds of chlorine into the atmosphere; another tank car containing potassium hydroxide solution (potassium cresylate, a corrosive liquid) lost 17,000 gallons of product; and a covered hopper car containing sodium chlorate (an oxidizer) spilled 85 dry gallons onto the ground. This chlorine spill is the second largest in U.S. history.


Alberton, MT; KPAX TV video; Missoula, MT

About 1,000 people from the surrounding area were evacuated. Approximately 350 people were treated for chlorine inhalation, 123 of whom sustained injury. Nine people, including both members of the train crew, were hospitalized. A transient riding the train died from acute chlorine toxicity.

U.S. Interstate Highway 90 (I-90) is roughly parallel and about 150 yards north of the MRL tracks at the accident site. The hazardous material cloud drifted across I-90 resulting in multiple highway traffic accidents. Several motorists were stranded in the cloud after these accidents. I-90 was closed requiring an 81-mile detour. Monetary damage was estimated to be $10 million. The Governor of Montana declared a state of emergency in Missoula and Mineral Counties. On April 14, 1996 the evacuation area was reduced to 15 square miles; residents were temporarily escorted into the area to feed and water livestock animals, retrieve personal possessions, and locate pets (NTSB, 1998).

The Emergency Planning and Community Right-to-Know Act (EPCRA) was enacted in 1986 to inform communities and citizens of chemical hazards in their areas. Sections 311 and 312 of EPCRA require businesses to report the locations and quantities of chemicals stored on-site to state and local governments in order to help communities prepare to respond to chemical spills and similar emergencies. EPCRA Section 313 requires the U.S. Environmental Protection Agency (EPA) and the states to annually collect data on releases and transfers of certain toxic chemicals from industrial facilities and make the data available to the public in the Toxics Release Inventory (TRI). In 1990 Congress passed the Pollution Prevention Act which required that additional data on waste management and source reduction activities be reported under TRI. The goal of TRI is to empower citizens, through information, to hold companies and local governments accountable in terms of how toxic chemicals are managed. Two active TRI facilities are located in Sanders County, as shown in **Table 4.3-2**.

Table 4.3-2 - Toxic Release Inventory – Total Aggregate Releases; 2014-2017

Facility/Year	Total On-Site Disposal or Other Releases	Total Off-Site Disposal or Other Releases	Total On- and Off-site Releases / Chemical	Chemical
US Antimony Corp., 47 Cox Gulch Road, Thompson Falls				
2017	5,346 lbs.	0	5,346 lbs.	Antimony
2015	6,443 lbs.	0	6,443 lbs.	Antimony
2014	5,491 lbs.	0	5,491 lbs.	Antimony
Thompson Falls Lumber, 241 Airport Road, Thompson Falls				
2017	16 lbs.	0	16 lbs.	Lead
2015	14 lbs.	0	14 lbs.	Lead
2014	10 lbs.	0	10 lbs.	Lead

Source: U.S. EPA, 2018; (https://iaspub.epa.gov/triexplorer/tri_release.chemical)

Many communication sites and the power generating dam facilities in Sanders County use hazardous materials and have Tier II reporting requirements, as shown in **Table 4.3-3.**

Table 4.3-3. Sanders County Tier II Hazardous Material Reporters

Facility Name	Location
Avista Noxon Rapids Hydro Electric	150 Noxon Rapids Dam Road, Noxon
Bonneville Power Admin – Noxon	Rural Location, Noxon
Bonneville Power Admin – Hot Springs Substation	16554 Hwy 28, Hot Springs
Bonneville Power Admin – Pats Knob	Rural Location, Plains
Verizon Wireless – Plains	Rural Location, Plains
Verizon Wireless – Thompson Falls	Rural Location, Thompson Falls
AT&T Corp. – Thompson Falls	Rural Location, Thompson Falls

Source: Sanders County OEM, 2018

The Yellowstone Pipe Line (YPL) Company pipeline moves petroleum products through Sanders County. Up until 1993, they had an easement through the Flathead Reservation in Sanders County to move gasoline, diesel and aviation fuel in their pipeline from refineries in Billings, Montana to Moses Lake, Washington. Roughly 21 miles of the pipeline was on land owned by the CSKT or held in federal trust for tribal members. Between 1986 and 1993, there were three major pipeline spills on reservation land. One of the largest spills involved a release of approximately 163,000 gallons spilled into Magpie Creek on the reservation near Dixon. In 1993, a 3,000-barrel spill on the reservation at Camas Creek near Hot Springs was so serious the CSKT Tribal Council revoked YPL's easement. Since then, Phillips 66 has had to transfer its pipeline fuel to trains in Missoula and haul it by rail to

Thompson Falls, where it goes back into the pipeline. Montana Rail Link transports about 23 to 30 rail cars of petroleum fuels per day from Missoula to Thompson Falls. An MRL representative indicated that in the past five years there have been four minor incidents during transfer of fuel to the YPL pipeline in Thompson Falls; however, no fuel was released.

The source and location of transportation accidents vary but the response is typically the same. Response is focused on determining the presence of hazardous materials and then assisting the injured. The regional hazardous-material response teams closest to Sanders County are positioned in Kalispell and Missoula.

There have been no federal or state disaster declarations associated with hazardous material incidents in Sanders County.

Highway Accidents

Car crashes occur in every community across the nation and can be devastating to families, friends, and communities. It is estimated that vehicle crashes cost the State approximately $595 million in wage loss, medical expenses, insurance administration, and property damage. This figure does not account for the indirect costs of human suffering and loss resulting from these tragedies. Vehicular accidents occur for a number of reasons including distracted drivers, driver fatigue, drunk driving, speeding, aggressive driving, and weather. In Montana vehicle collisions with wildlife are a common occurrence. Statistics on highway accidents in Sanders County over the past 10 years are presented in **Table 4.3-4**. Information is not available on whether these incidents involved a hazardous material response.

Table 4.3-4. Sanders County Vehicular Crash Data; 2007 - 2016

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	TOTAL
All Crashes											
Fatal Crash	5	7	8	3	6	3	5	5	2	3	**47**
Serious Injury Crash	23	13	14	19	16	24	14	22	28	10	**183**
Total # of Crashes	187	165	150	176	167	185	194	276	268	263	**2,031**
Nighttime Crashes											
Fatal Crash	0	2	2	0	2	1	1	1	2	1	**12**
Serious Injury Crash	10	5	7	2	2	9	1	4	9	1	**50**
Total # of Crashes	67	55	59	60	57	69	68	97	115	97	**744**
Rural Roadway Crashes											
Fatal Crash	5	7	8	3	6	3	4	5	2	3	**46**
Serious Injury Crash	23	13	14	19	16	24	14	22	28	10	**183**
Total # of Crashes	179	157	145	175	165	181	188	275	263	259	**1,987**
Winter Crashes											
Fatal Crash	3	3	2	1	0	0	1	2	2	0	**14**
Serious Injury Crash	3	3	3	5	4	6	4	4	7	2	**41**
Total # of Crashes	72	45	54	80	65	64	82	93	94	102	**751**
Wild Animal Involved Crashes											
Fatal Crash	0	1	0	1	2	0	0	0	-	-	**4**
Serious Injury Crash	2	0	0	2	3	3	2	2	-	-	**14**
Total # of Crashes	31	39	25	30	44	48	58	97	-	-	**372**

Source: MDT, 2018 (http://www.mdt.mt.gov/publications/datastats/crashdata.shtml); Notes "-" = Data Not Available

There is no history of a mass casualty accident in Sanders County involving a school bus or tour bus; however, school events use bus transport during winter months when severe weather can pose an extreme risk.

Railroad Accidents

According to the National Transportation Safety Board (NTSB), 60 percent of all railroad accidents occur at unprotected or passive crossings. There has been one fatality and six injuries at railroad crossings in Sanders County in the past 40 years, as shown in **Table 4.3-5**.

Table 4.3-5. Sanders County Accidents at Railroad Crossings: 1975 – 2018

Date	Nearest Station	Road	Fatalities	Injuries	Crossing Protection
8/3/1976	Thompson Falls	Brownman Spur Crossing	0	0	Cross bucks
12/24/1978	Heron	County Road	0	0	HWTS,WW,Bells
7/5/1980	Childs	Private Crossing	0	0	Stop signs
10/19/1980	Belknap	Private Crossing	0	0	Stop signs
7/20/1981	Dixon	Private Crossing	0	0	Stop signs
3/24/1982	Plains	Private Crossing	0	0	Stop signs
5/11/1984	Plains	Central Ave	0	1	HWTS,WW,Bells
7/20/1986	Weeksville	Private Crossing	0	0	Stop signs
7/4/1988	Childs	Private Crossing	0	0	Stop signs
1/13/1989	Thompson Falls	Private-Belknap Crossing	0	0	Stop signs
12/10/1989	Thompson Falls	Pearl Street	0	0	Flashing lights
1/7/1991	Thompson Falls	Private Crossing	0	0	Stop signs
8/11/1991	Thompson Falls	Pearl St	0	0	Gates
10/3/1992	Childs	Finley Road	0	0	Cross bucks
12/15/1992	Plains	Willis Crossing	0	1	Gates
1/15/1993	Paradise	River Road East	1	0	Cross bucks
7/16/1994	Eddy	Private Crossing	0	0	Stop signs
11/14/1996	Plains	Panorama Road	0	0	Stop signs
12/27/1996	Plains	Private Crossing	0	0	Stop signs
8/24/1998	Paradise	West Crossing	0	0	Stop signs
2/11/1999	Dixon	Hwy 212	0	1	Flashing lights
5/10/2000	Dixon	Private Crossing	0	0	Stop signs
9/16/2000	Dixon	Highway 212	0	0	Gates
11/29/2000	Trout Creek	S. Hilltop Road	0	0	Stop signs
12/20/2001	Thompson Falls	Blue Slide Road	0	0	Flashing lights, gates
11/24/2003	Dixon	Hwy 212	0	1	Flashing lights
5/19/2006	Plains	Weeksville	0	0	Cross bucks
3/30/2007	Dixon	Dixon Crossing	0	1	Cross bucks
3/20/2018	Toole	Donlan Flats Rd.	0	1	Cross bucks
TOTAL			**1**	**6**	

Notes: HWTS = Highway Traffic Signal; WW = Wigwag Signal
Source: Federal Railroad Administration, 2018; http://safetydata.fra.dot.gov/OfficeofSafety/publicsite/Query/gxrabbr.aspx

Federal Railroad Administration data indicates that that between 1975 and 2018, fifty (50) railroad accidents occurred in Sanders County, including six derailments that involved railcars carrying hazardous materials (**Table 4.3-6**). Only one incident involved a hazardous material release.

Table 4.3-6. Sanders County Railroad Accidents; 1975 – 2018

Date	Nearest Town	Fatalities	Injuries	Haz-Mat Cars	Haz-Mat Cars Damaged	Comments
11/7/1977	Noxon	0	0	-	-	Collision. 0 cars derailed
1/7/1978	Heron	0	0	-	-	1 car derailed
5/26/1979	Paradise	0	0	-	-	6 cars derailed
10/27/1979	Plains	0	0	-	-	1 car derailed
11/22/1979	Eddy	0	0	-	-	17 cars derailed
6/19/1981	Thompson Falls	0	0	-	-	7 cars derailed
11/1/1981	Heron	0	0	-	-	46 cars derailed
4/6/1982	Noxon	0	1	-	-	24 cars derailed
12/31/1982	Trout Creek	0	0	2	0	30 cars derailed
4/16/1984	Noxon	0	0	-	-	1 car derailed
1/12/1985	Noxon	0	0	-	-	0 cars derailed
4/20/1985	Childs	0	0	-	-	0 cars derailed
1/15/1987	Childs	0	0	-	-	10 cars derailed
12/3/1990	Thompson Falls	0	0	-	-	20 cars derailed
9/16/1991	Perma	0	0	1	0	15 cars derailed
11/22/1991	Childs	0	0	-	-	22 cars derailed
4/19/1993	Heron	0	0	-	-	1 car derailed
6/23/1993	Woodlin	0	0	-	-	5 cars derailed
7/26/1993	Paradise	0	0	-	-	0 cars derailed
2/14/1994	Paradise	0	0	-	-	2 cars derailed
2/18/1994	Thompson Falls	0	0	-	-	4 cars derailed
7/20/1994	Dixon	0	0	-	-	3 cars derailed
3/21/1995	Paradise	0	0	-	-	5 cars derailed
2/7/1996	Eddy	0	0	-	-	10 cars derailed
2/9/1996	Heron	0	2	-	-	14 cars derailed
4/11/1996	Noxon	0	0	-	-	21 cars derailed
6/2/1996	Noxon	0	0	1	0	17 cars derailed
5/14/1997	Eddy	0	0	-	-	2 cars derailed
3/22/1998	Toole	0	0	-	-	1 car derailed
10/6/1998	Thompson Falls	0	0	-	-	0 cars derailed
1/5/1999	Paradise	0	0	-	-	0 cars derailed
1/19/1999	Thompson Falls	0	0	-	-	2 cars derailed
7/11/1999	Paradise	0	0	6	5	29 cars derailed/55K-gals. asphalt spilled.
8/29/2000	Eddy	0	0	-	-	1 car derailed
2/15/2001	Plains	0	0	2	0	4 cars derailed
10/14/2001	Heron	0	0	-	-	13 cars derailed
5/3/2003	Thompson Falls	0	0	-	-	1 car derailed
10/31/2003	Paradise	0	0	-	-	9 cars derailed
9/6/2004	Noxon	0	0	-	-	1 car derailed
1/14/2005	West Plains	0	0	-	-	0 cars derailed
4/24/2005	Thompson Falls	0	0	-	-	1 car derailed
4/11/2006	Heron	0	0	-	-	Collision. 0 cars derailed
5/19/2006	Plains	0	0	-	-	0 cars derailed
6/2/2006	Perma	0	0	-	-	1 car derailed
11/13/2006	Trout Creek	0	0	-	-	27 cars derailed
10/22/2008	Plains	0	0	-	-	19 cars derailed
1/22/2011	Plains	0	0	-	-	1 car derailed
6/10/2014	Plains	0	0	-	-	Collision. 0 cars derailed
8/13/2017	Heron	0	0	-	-	33 cars derailed
3/5/2018	Dixon	0	0	1	0	1 car derailed
TOTAL		**0**	**3**	**13**	**5**	

Source: Federal Railroad Admin. 2018. http://safetydata.fra.dot.gov/OfficeofSafety/publicsite/Query/incabbr.aspx

Oil trains are a constant concern because of the catastrophic impacts that could result from a derailment that ruptures an oil tanker in town or into waterways. A derailment into the river could impact the fishery. There are more oil trains passing through Sanders County now than when the 2012 PDM Plan was completed, but the number is down since the Bakken Oil Field decline. Montana Rail Link currently averages one oil train per day through Sanders County compared to two or three per day in 2015. In addition, there are about three trains per day hauling coal through Sanders County. Below are descriptions of derailments that spilled asphalt and coal into the Clark Fork River.

July 12, 1999 – Twenty-nine (29) cars of a 76-unit westbound MRL freight train derailed, and four cars landed in the Clark Fork River, one of them leaking liquid asphalt another spilling cases of beer. Haz-mat teams from Sanders County and the railroad responded, but the environmental cleanup wasn't significant since the asphalt solidified and was relatively easy to clean up. One asphalt car landed in the river but wasn't leaking, and a propane tanker was stuck on a sandbar but upright and not leaking. The derailment occurred in 91-degree temperatures and was caused by a "sun kink" that warped the rails. There were no injuries. The scene was two miles west of Paradise and occurred when the train was traveling at 45 mph. About 1,500 feet of track were torn up and the MRL mainline was closed for several days to undergo repair. (Seattle Times, *Train Wreck Spills Beer, Asphalt into River – Cases of Brew Bob Down the Clark Fork*, July 12, 1999).

August 13, 2017 – A westbound 120-car train derailed around 11 p.m. about 10 miles west of Noxon along the Clark Fork River. Thirty (30) of the cars carrying coal tipped over spilling several thousand tons of coal near or into the river. There were no injuries and the train was not hauling hazardous materials. (Spokesman-Review, *30 Coal Cars Derail in Northwest Montana*, August 14, 2017).

Aircraft Accidents

Sanders County has airports in Thompson Falls, Plains and Hot Springs. Firefighting aircraft utilize these airports during suppression efforts, as needed. Aviation accidents can occur for a multitude of reasons from mechanical failure to poor weather conditions to pilot error. They usually don't involve a hazardous material release but are often fatal to the occupants. Federal Aviation Administration (FAA) database listings for aircraft accidents in Sanders County are presented in **Table 4.3-7.** There have been seven fatalities since 1985 in Sanders County.

Table 4.3-7. Sanders County Aircraft Accidents

Date	Location	Fatalities	Aircraft Type	Date	Location	Fatalities	Aircraft Type
2/11/1985	TFalls	0	Piper PA-18	8/8/2001	TFalls	0	Piper PA-24-250
7/27/1990	TFalls	0	Bell BH-214	4/20/2002	Hot Springs	0	Enstrom F-28C
7/29/1990	TFalls	0	Glasflugel H 301	5/30/2002	Plains	0	Sikorsky CH-19E
9/9/1994	Dixon	2	Piper J3C-65	7/2/2002	Heron	0	Taylorcraft F19
4/13/1996	Plains	0	Cessna 150F	6/27/2010	Dixon	4	Piper PA-28R-180
5/7/1997	Plains	0	Cessna 150F	6/3/2011	Heron	0	Rusk Smith Super Cub
12/18/1997	TFalls	0	Cessna 177	7/27/2013	TFalls	1	Robinson Helicopter
6/25/1998	TFalls	0	Aeronca 7-AC	1/5/2017	Paradise	0	Softex Invest LLC V-24L

Source: FAA, 2018; http://www.faa.gov/data_research/accident_incident/

Vulnerability and Area of Impact

The potential for a hazardous material accident in Sanders County is present, in part due to the number of semi-trucks and trailers using highways and roads in the county, the railroad transporting pipeline fuel, and the YPL petroleum pipeline. Use of hazardous materials at fixed facilities is also present at various locations throughout the county. Although there is no history of significant hazardous material incidents in Sanders County, the potential is present.

The volume and type of hazardous materials that flow into, are stored, and flow through communities will determine exposure to a potential release of hazardous materials. An accidental or intentional release of materials could produce a health hazard to those in the immediate area, downwind, and/or downstream.

Privately-owned vehicles provide transportation for individuals in Sanders County using the state highway systems as well as county and private roads. Trucks and trailers carry interstate and intrastate cargo. Highway accidents caused by severe weather and high speeds occur frequently.

Railroad related hazards such as derailments, toxic spill contamination, and vehicle collisions are a threat to Sanders County residents. According to the NTSB, more than 80 percent of public railroad crossings do not have lights and gates, and 60 percent of all railroad accidents occur at these unprotected crossings. Currently, the closest haz-mat teams to Thompson Falls are located in Missoula or Kalispell, 100 miles away.

At the time the 2012 PDM Plan was completed, concern was raised that the main residential area of Thompson Falls had the possibility of being cut off from emergency aid, as all three exits from the northern part of the town could be blocked by a single train. Since that time, a fourth railroad crossing was installed in Thompson Falls that is available for evacuation if needed.

Probability and Magnitude

Sanders County is vulnerable to all types of hazardous material and transportation accident emergencies. The major effects of these incidents are loss of life or injury, environmental degradation, and economic impact. It is not common for structural loss to be a consequence.

According to the U.S. Department of Transportation, Office of Hazardous Materials Safety, three hazardous material releases are reported for Sanders County; two highway, and one railroad incident. Only the railroad incident had reported damages (**Table 4.3-8**).

Table 4.3-8. Sanders County Hazardous Material Incidents with Damages

Date	Location	Carrier	Quantity Released	Commodity Released	Damages	Mode of Transport
11/12/1974	Dixon	Rice Truck Lines	0	Gasoline	$0	Highway
11/12/1974	Dixon	Rice Truck Lines	0	Combustible Liquid	$0	Highway
9/7/1979	Hot Springs	Matlack Inc.	3,000 gal,	Combustible Liquid	$0	Highway
7/11/1999	Paradise	Montana Rail Link	16,000 gal.	Corrosive Liquid	$641,955	Railroad
7/11/1999	Paradise	Montana Rail Link	3,000 gal.	Corrosive Liquid	$641,955	Railroad
7/11/1999	Paradise	Montana Rail Link	4,000 gal.	Corrosive Liquid	$641,955	Railroad
7/11/1999	Paradise	Montana Rail Link	14,000 gal.	Corrosive Liquid	$641,955	Railroad
7/11/1999	Paradise	Montana Rail Link	18,000 gal.	Corrosive Liquid	$641,955	Railroad
TOTAL					**$3,209,775**	

Source: U.S. Dept. Transportation, 2018; https://hazmatonline.phmsa.dot.gov/IncidentReportsSearch/IncrSearch.aspx

To model the spatial distribution of hazardous material incident risk a GIS layer of transportation arteries was used, which included highways, major roadways, railroads, and pipelines. Fixed facilities, including TRI and Tier II sites, were added to this layer and it was then buffered by 0.25 miles. **Figures 6, 6A, 6B, and 6C** present the hazardous material buffer used for the MHMP analysis in Sanders County, Thompson Falls, Plains, and Hot Springs, respectively, and the vulnerability of critical facilities.

Table 4.3-9. Sanders County Vulnerability Analysis – Haz-Mat Incidents

Category	Sanders Co. (balance)	Thompson Falls (city)	Plains (town)	Hot Springs (town)
Residential Property Exposure $	$179,581,335	$35,982,820	$29,522,553	$11,897,655
# Residences at Risk	1,604	384	373	135
Commercial/Ag & Industrial Property Exposure $	$103,338,136	$15,000,798	$16,985,671	$5,124,411
# Commercial/Ag & Industrial Properties at Risk	569	72	82	39
Critical Facilities Exposure Risk $	$34,530,830	$25,431,752	$32,671,113	$8,866,955
# Critical Facilities at Risk	34	16	6	7
Bridge Exposure $	$61,987,320	$0	$0	$0
# Bridges at Risk	35	0	0	0
Persons at Risk	2,154	687	687	381
Persons Under 18 at Risk	726	231	231	128
Persons Over 65 at Risk	1,230	448	448	203

The GIS analysis indicates that there are over 87,007 acres in Sanders County (4.9 percent) in the hazardous material buffer including 2,496 residences, 762 commercial/agricultural and industrial buildings, and 63 critical facilities. The *Hazardous Material Incident* section in **Appendix C** lists the critical facilities within the hazardous material transportation buffer.

The history of hazardous material incidents in Sanders County indicates 31 minor events over the past 28 years. As such, the probability of future events is rated as "highly likely"; an event that happens more than once a year. The magnitude of any hazardous material event would depend on the amount and material spilled. The MHMP Planning Team rated the hazardous material incident hazard as "likely", the railroad accident hazard as "possible" and the probability of a pipeline spill as "unlikely".

Sanders County is vulnerable to vehicular accidents. A mass casualty incident involving a school bus is also a possibility and a concern since remote locations have limited resources making response time slow which could delay treatment of the injured. In the past 10 years, there have been 2,031 motor vehicle accidents in Sanders County, including 47 crashes involving fatalities and 183 crashes resulting in severe injuries. Therefore, the probability of highway accidents is rated as "highly likely".

Seven fatalities have occurred in Sanders County from aircraft accidents over the past 33 years resulting in a hazard ranking of "likely", an event that occurs more than once a decade but not every year.

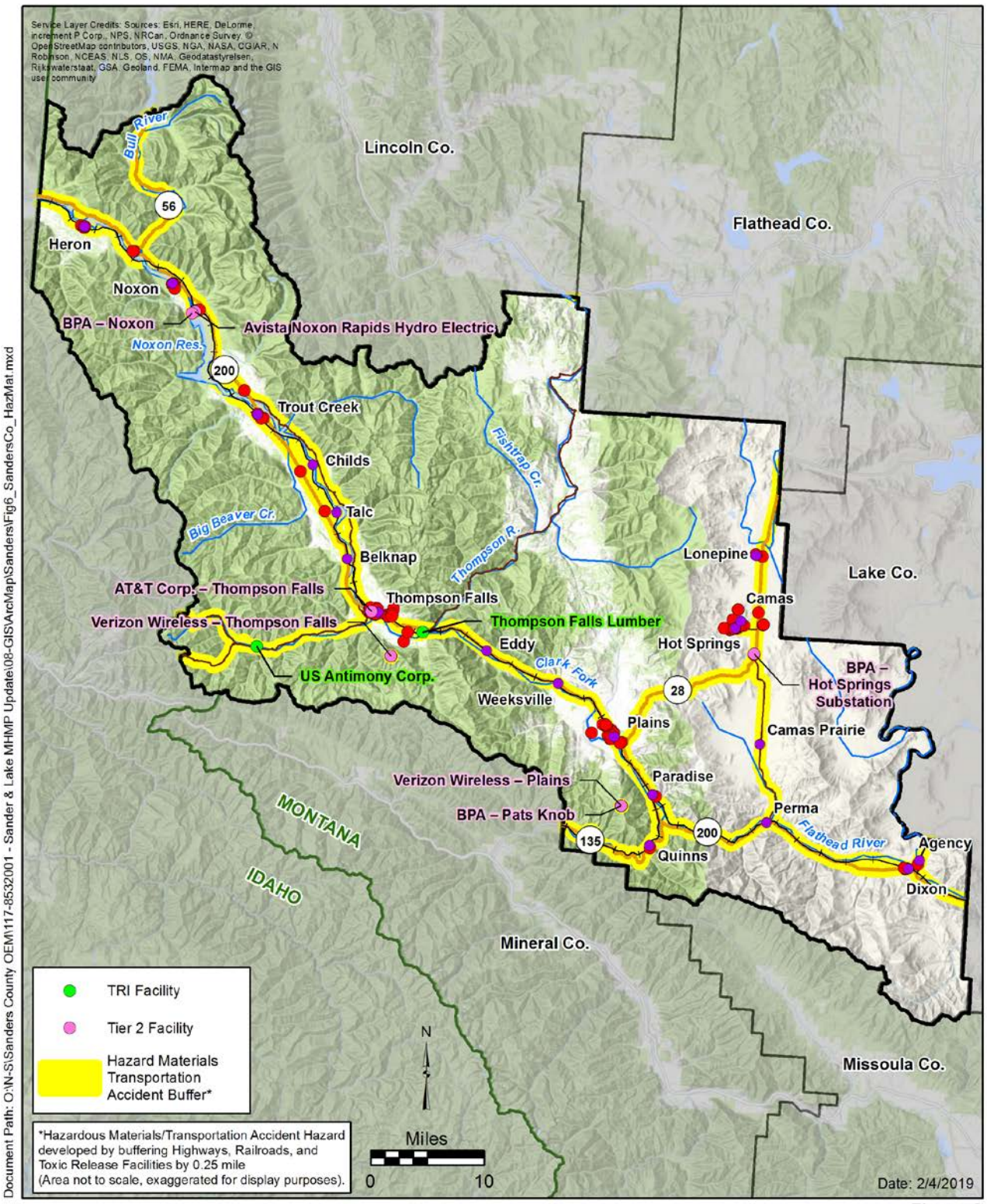


Figure 6
Hazardous Material/Transportation Accident Buffer
Sanders County, Montana
Multi-Hazard Mitigation Plan

Legend

- Town
- Critical Facility
- Railroad
- MT Highway
- Secondary Road
- River
- Lake/Reservoir
- County Boundary

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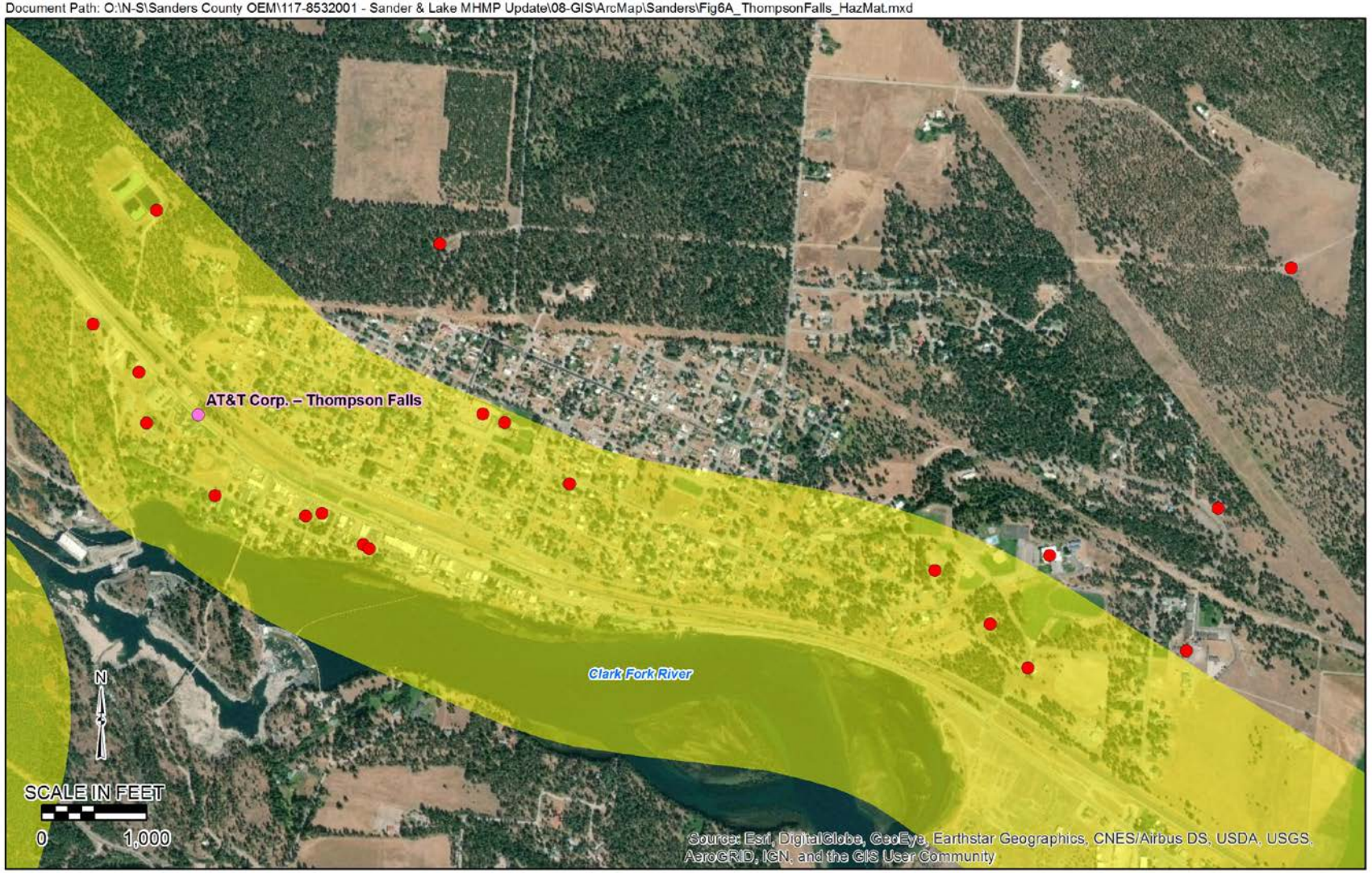

Date: 2/4/2019

Legend

- Tier 2 Facility
- Critical Facility
- Hazard Materials Transportation Accident Buffer

Figure 6A
Thompson Falls - Hazardous Materials/ Transportation Accident Buffer
Sanders County, Montana
Multi-Hazard Mitigation Plan

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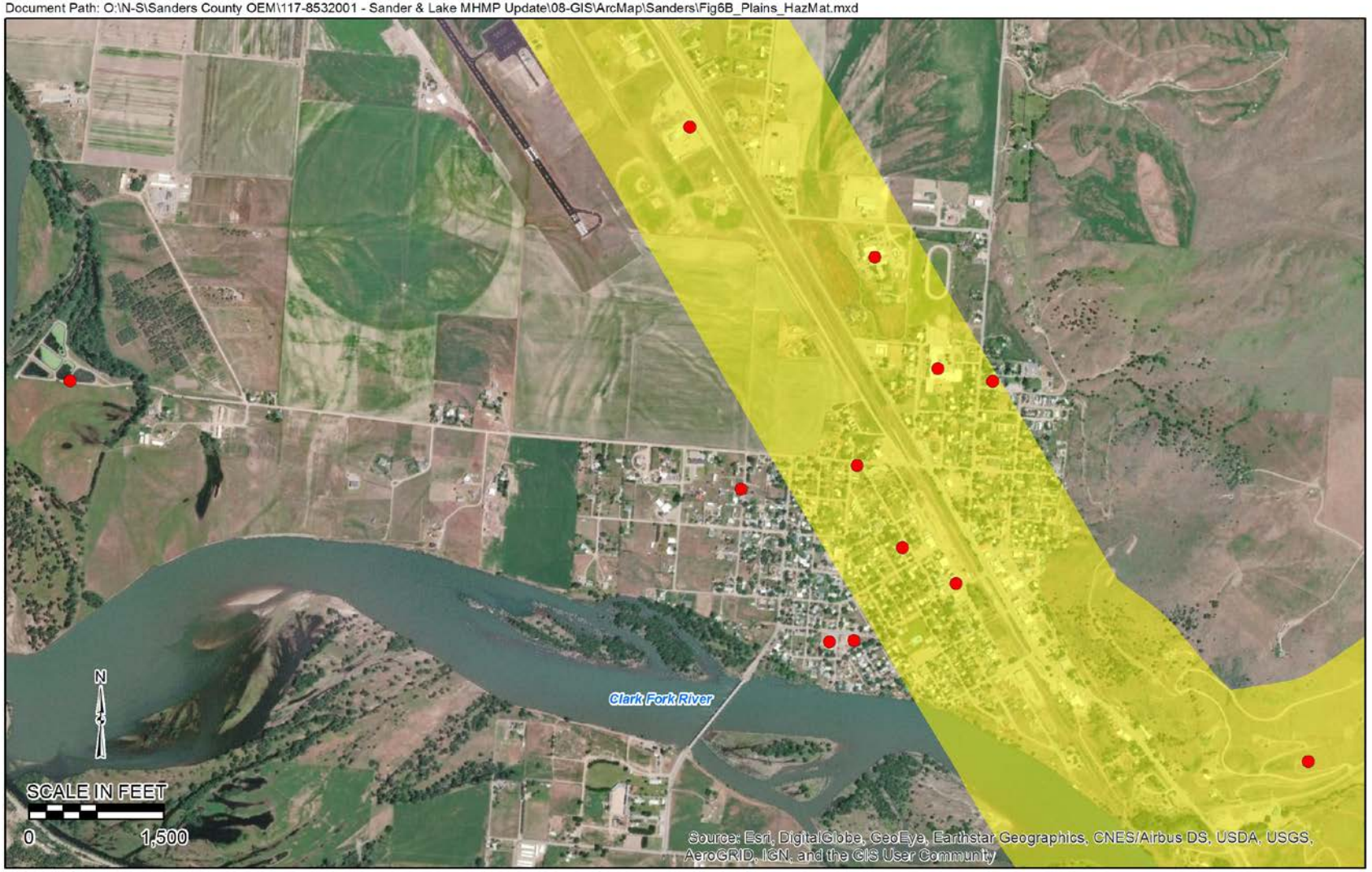

Date: 2/4/2019

Legend

- Critical Facility
- Hazard Materials Transportation Accident Buffer

Figure 6B
Plains - Hazardous Materials/ Transportation Accident Buffer
Sanders County, Montana
Multi-Hazard Mitigation Plan

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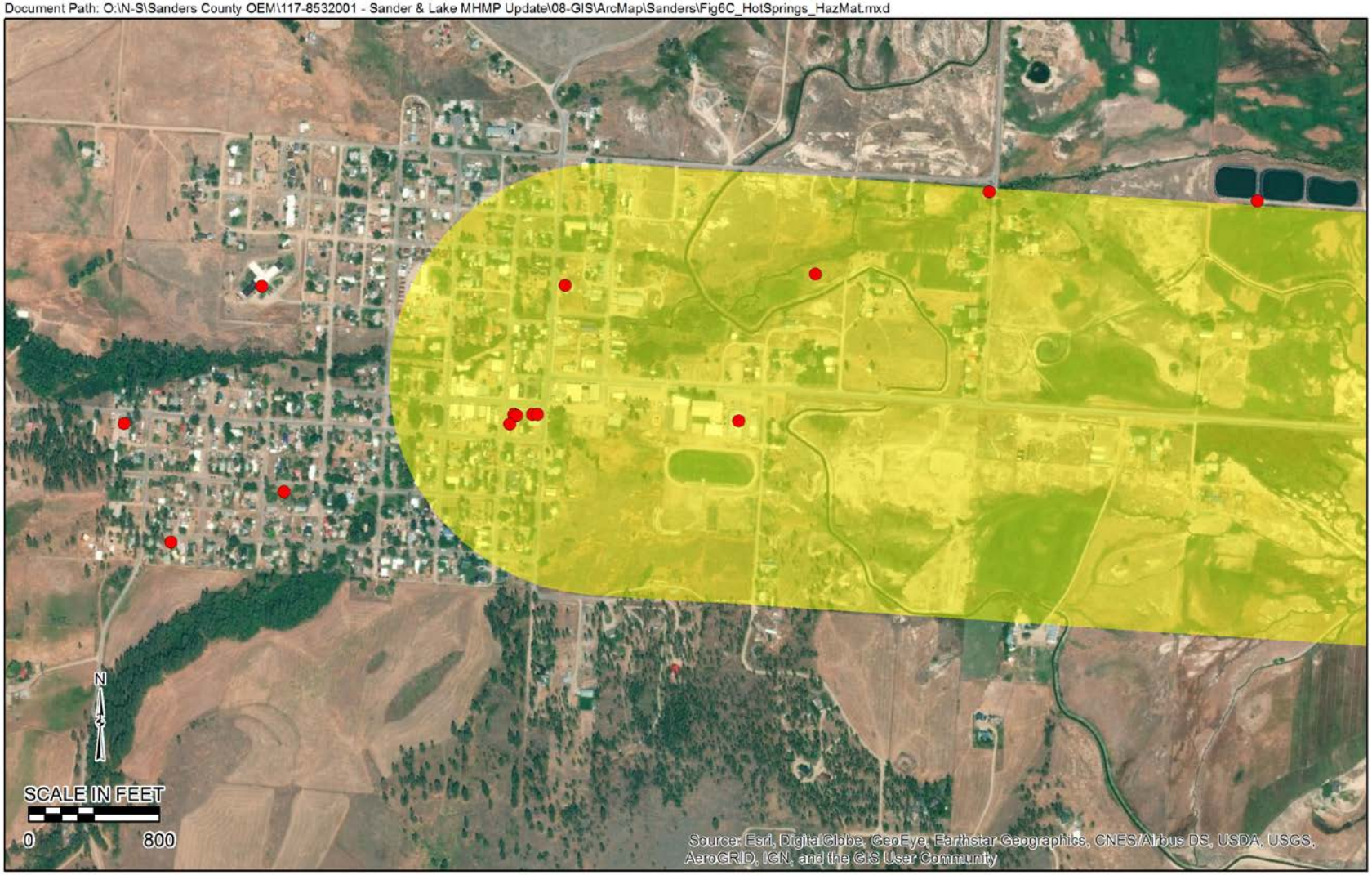


Date: 2/4/2019

Legend

- Critical Facility
- Hazard Materials Transportation Accident Buffer

Figure 6C
Hot Springs - Hazardous Materials/ Transportation Accident Buffer
Sanders County, Montana
Multi-Hazard Mitigation Plan

Future Development

Sanders County has no land use regulations that specifically restrict building around industrial facilities or along transportation routes or in the vicinity of facilities that store hazardous materials or petroleum products. However, impacts to public health and safety are considered for all new subdivisions.

Climate Change

Hazardous material incidents and transportation accidents are not expected to increase as a result of climate change. No increase in exposure or vulnerability to the population, property, or critical facilities are expected to occur. Climate change is not anticipated to directly impact the transportation accident hazard. Secondary impacts to public health may result due to increased smoke from wildfire activity which may increase highway accidents.

4.4 Severe Weather and Drought

CPRI SCORES:
SEVERE SUMMER WEATHER = 2.50
SEVERE WINTER WEATHER = 2.40

Description and History

Severe weather hazards have become more significant in recent years due to climate change. Natural resource trends indicate the mean annual precipitation has been below average and the mean annual temperatures have been above average for the past decade making drought conditions more frequent. Severe summer weather includes excessive heat, thunderstorms, wind, hail, lightning, tornadoes, and microbursts that typically occur between May and October of each year. The winter weather hazard includes weather events that typically occur from late fall through early spring in Sanders County (November through April) and can include snow, blizzards, extended cold, and high winds. Further details on severe weather hazards are profiled below.

Severe Winter Weather

Winter storms and blizzards follow a seasonal pattern that begins in late fall and lasts until early spring. These storms have the potential to destroy property and cause human fatality or injury. Winter storms may be categorized as sleet, ice storms or freezing rain, heavy snowfall or blizzards, and low temperatures. Blizzards are most commonly connected with blowing snow and low visibility.

A severe winter storm is generally a prolonged event involving snow or ice and extreme cold. The characteristics of severe winter storms are determined by the amount and extent of snow or ice, air temperature, wind speed, and event duration. Severe winter storms create conditions that disrupt essential regional systems such as public utilities, telecommunications, and transportation routes.

A combination of below zero temperatures, heavy snow, and high winds can close roads, disrupt utilities, limit access to rural homes, impede emergency services delivery and close businesses. Such storms also create hazardous travel conditions, which can lead to increased vehicular accidents and threaten air traffic. Additionally, motorists stranded due to closed roads and highways may present a shelter problem.

Avalanches do not impact Sanders County communities as most homes are located away from steep slopes. The biggest avalanche threat is to recreationists who backcountry ski or snowmobile within the national forest. There is no record of an avalanche fatality in Sanders County.

The National Weather Service provides short-term forecasts of hazardous weather to the public by producing regularly-scheduled severe weather outlooks and updates on various forms of hazardous weather including blizzards and wind chill. Warning and Advisory Criteria for winter weather is presented in **Table 4.4-1**.

Table 4.4-1. Warning and Advisory Criteria for Severe Winter Weather

Winter Weather	Weather Advisory
Winter Storm Watch	Issued to give the public 12-48 hours of advance notice of the potential for snow 6 inches or more in 12 hours or 8 inches or more in 24 hours AND sustained or frequent wind gusts of 25 – 34 mph occasionally reducing visibilities to ¼ mile or less for three hours or more.
Winter Weather Advisory	Issued when a combination of winter weather elements that may cause significant inconveniences a re occurring, imminent, or have a high probability of occurring.

Table 4.4-1. Warning and Advisory Criteria for Severe Winter Weather

Winter Weather	Weather Advisory
Winter Storm Warning	Issued when snow 6 inches or more in 12 hours or 8 inches or more in 24 hours AND sustained or frequent wind gusts of 25-34 mph occasionally reducing visibilities to ¼ mile or less for three hours or more are occurring, imminent, or have a high probability of occurring.
Blizzard Watch	Issued to give the public 12-48 hours of advance notice of possible blizzard conditions (sustained winds or frequent gusts of 35 mph or greater and visibilities of less than a quarter mile from falling and/or blowing snow for 3 hours or more).
Blowing Snow Advisory	Issued for visibilities intermittently at or below ½ mile because of blowing snow.
Blizzard Warning	Issued when blizzard conditions (sustained winds or frequent gusts of 35mph or greater and visibilities of less than a quarter mile from falling and/or blowing snow for 3 hours or more) are occurring, imminent, or have a high probability of occurring.
Freezing Rain Advisory	Issued when an accumulation of ice will make roads and sidewalks slippery, but significant and damaging accumulations of ice are not expected.
Ice Storm Warning	Issued when a significant and damaging accumulation of ice is occurring, imminent or has a high probability of occurring.
Snow Advisory	Issued when snow accumulations of 2-5 inches in 12 hours are expected.
Sleet Advisory	Issued when sleet accumulations causing hazardous conditions are expected.
Heavy Snow Warning	Issued when snow accumulations of 6 inches or more in 12 hours or 8 inches or more in 24 hours are expected.
Wind Chill Watch	Issued to give the public 12-48 hours advanced notice of the potential for wind chills of -40°F or colder with a wind speed of 10 mph or higher and a duration of 6 hours or more.
Wind Chill Advisory	Issued when wind chills of -20°F to -39°F with a wind speed of 10 mph or higher and a duration of 6 hours or more are expected.
Wind Chill Warning	Issued when wind chills of -40°F or colder with a wind 10 mph wind in combination with precipitation.

Source: National Weather Service (NWS, 2018)

Snow storms and low temperatures are common during winter in Sanders County and residents are generally prepared for it. Sometimes, blizzards can occur and overwhelm the ability to keep roads passable. Heavy snow events also have the potential to bring down power lines and trees and cause structural damage. Sanders County MHMP Planning Team members indicated that power interruption during severe winter weather is less of a concern than when the 2012 PDM Plan was completed because of improved utility infrastructure. **Table 4.4-2** presents the severe winter weather events in Sanders County since 2000 from the National Climatic Data Center.

Table 4.4-2. Sanders County Severe Winter Weather Reports (~November-April)

Date	Event	Date	Event	Date	Event
1/1/2000	Heavy Snow	1/17/2005	Winter Weather	3/21/2012	Heavy Snow
1/3/2000	Heavy Snow	3/17/2005	Winter Storm	12/1/2012	Heavy Snow
1/8/2000	Heavy Snow	12/1/2005	Winter Storm	12/7/2012	Heavy Snow
1/9/2000	High Wind	12/21/2005	Winter Weather	12/16/2012	Heavy Snow
1/13/2000	Heavy Snow	1/9/2006	Winter Storm	4/21/2013	Heavy Snow
2/1/2000	Heavy Snow	1/16/2006	Heavy Snow	11/2/2013	Winter Weather
2/14/2000	Heavy Snow	1/20/2006	Heavy Snow	11/5/2013	Winter Weather
2/23/2000	Heavy Snow	1/28/2006	Heavy Snow	11/7/2013	Winter Weather
3/14/2000	Heavy Snow	1/29/2006	Heavy Snow	11/15/2013	Heavy Snow
3/28/2000	Heavy Snow	2/4/2006	Heavy Snow	11/29/2013	Winter Weather
11/4/2000	Heavy Snow	2/16/2006	Cold/Wind Chill	12/1/2013	Winter Weather
11/8/2000	Heavy Snow	2/23/2006	Heavy Snow	12/2/2013	Heavy Snow
12/14/2000	Winter Storm	3/8/2006	Winter Storm	12/6/2013	Extreme Cold/Wind Chill
12/15/2000	Blizzard	5/27/2006	Heavy Snow	12/9/2013	Winter Weather
12/16/2000	Heavy Snow	11/10/2006	Heavy Snow	12/20/2013	Heavy Snow
12/26/2000	Heavy Snow	11/12/2006	Heavy Snow	1/7/2014	Winter Weather
1/30/2001	Heavy Snow	11/23/2006	Winter Storm	1/11/2014	Winter Storm
2/2/2001	Heavy Snow	11/24/2006	Heavy Snow	1/18/2014	Winter Weather

Table 4.4-2. Sanders County Severe Winter Weather Reports (~November-April)

Date	Event	Date	Event	Date	Event
2/4/2001	Heavy Snow	12/13/2006	Winter Storm	1/29/2014	Winter Storm
2/15/2001	Winter Storm	12/14/2006	Winter Storm	2/3/2014	Winter Weather
3/13/2001	High Wind	1/2/2007	Heavy Snow	2/4/2014	Extreme Cold/Wind Chill
11/22/2001	Heavy Snow	1/5/2007	Winter Storm	2/8/2014	Winter Weather
11/28/2001	Heavy Snow	2/19/2007	Winter Storm	2/11/2014	Winter Weather
12/1/2001	Heavy Snow	11/18/2007	Heavy Snow	2/14/2014	Winter Weather
12/2/2001	Heavy Snow	11/26/2007	Heavy Snow	2/17/2014	Heavy Snow
12/6/2001	Heavy Snow	12/2/2007	Winter Storm	2/18/2014	Heavy Snow
12/12/2001	Heavy Snow	12/19/2007	Heavy Snow	2/20/2014	Heavy Snow
12/15/2001	Heavy Snow	12/23/2007	Heavy Snow	2/21/2014	Heavy Snow
1/18/2002	Heavy Snow	12/29/2007	Winter Storm	2/23/2014	Winter Storm
1/24/2002	Heavy Snow	1/10/2008	Heavy Snow	2/24/2014	Heavy Snow
1/29/2002	Heavy Snow	1/19/2008	Winter Storm	2/27/2014	Winter Storm
2/7/2002	Heavy Snow	1/26/2008	Winter Storm	3/1/2014	Extreme Cold/Wind Chill
3/5/2002	Heavy Snow	1/29/2008	Heavy Snow	3/2/2014	Heavy Snow
3/11/2002	Heavy Snow	1/30/2008	Winter Storm	11/1/2014	Heavy Snow
3/18/2002	Heavy Snow	2/1/2008	Heavy Snow	11/29/2014	Winter Storm
5/7/2002	Heavy Snow	2/6/2008	Winter Storm	12/24/2014	Winter Weather
5/21/2002	Heavy Snow	2/7/2008	Winter Storm	12/27/2014	Heavy Snow
6/8/2002	Heavy Snow	3/3/2008	Winter Storm	12/28/2014	Winter Storm
11/9/2002	Winter Storm	4/19/2008	Heavy Snow	1/4/2015	Heavy Snow
11/23/2002	Winter Storm	6/10/2008	Heavy Snow	3/2/2015	Heavy Snow
12/26/2002	Winter Storm	11/13/2008	High Wind	11/24/2015	Winter Storm
12/28/2002	Heavy Snow	12/12/2008	Winter Storm	12/3/2015	Ice Storm
12/30/2002	Heavy Snow	12/13/2008	Cold/Wind Chill	12/12/2015	Winter Storm
1/22/2003	Heavy Snow	12/17/2008	Heavy Snow	12/18/2015	Winter Storm
1/30/2003	Heavy Snow	12/27/2008	Heavy Snow	12/21/2015	Heavy Snow
2/3/2003	Heavy Snow	12/29/2008	Heavy Snow	1/13/2016	Winter Storm
2/16/2003	Winter Storm	1/1/2009	Winter Storm	2/2/2016	Winter Storm
2/21/2003	Winter Storm	2/24/2009	Heavy Snow	12/4/2016	Winter Storm
3/5/2003	Winter Storm	2/25/2009	Heavy Snow	12/11/2016	Heavy Snow
3/8/2003	Heavy Snow	3/5/2009	Winter Storm	12/14/2016	Heavy Snow
11/10/2003	Winter Storm	3/24/2009	Heavy Snow	12/20/2016	Winter Storm
11/16/2003	Winter Storm	11/7/2009	Winter Storm	12/27/2016	Winter Storm
11/20/2003	Heavy Snow	12/31/2009	Heavy Snow	1/8/2017	Winter Storm
11/23/2003	Winter Storm	1/1/2010	Heavy Snow	1/18/2017	Winter Storm
11/25/2003	Heavy Snow	1/12/2010	Winter Weather	2/3/2017	Winter Storm
11/28/2003	Winter Storm	11/22/2010	Blizzard	2/5/2017	Heavy Snow
12/13/2003	Winter Storm	12/27/2010	Heavy Snow	3/4/2017	Heavy Snow
1/1/2004	Winter Storm	1/12/2011	Heavy Snow	3/7/2017	Heavy Snow
1/3/2004	Winter Storm	2/15/2011	Heavy Snow	3/8/2017	Winter Weather
1/5/2004	Cold/Wind Chill	2/21/2011	Heavy Snow	5/17/2017	Heavy Snow
3/5/2004	Winter Storm	11/12/2011	Heavy Snow	9/13/2017	Heavy Snow
5/10/2004	Heavy Snow	11/16/2011	Heavy Snow	12/18/2017	Winter Storm
10/24/2004	Heavy Snow	11/17/2011	Heavy Snow	12/28/2017	Winter Storm
12/7/2004	Winter Storm	11/18/2011	Heavy Snow	1/6/2018	Winter Weather
12/14/2004	Winter Weather	1/16/2012	Heavy Snow	1/11/2018	Heavy Snow
1/7/2005	Winter Storm	1/29/2012	Heavy Snow	2/17/2018	Winter Storm
1/11/2005	Winter Storm	2/22/2012	High Wind	2/24/2018	Winter Storm
1/14/2005	Winter Weather	3/12/2012	Heavy Snow		

Source: NCDC, 2018

The Sanders County MHMP Planning Team recalled that the winter of 2016-2017 saw lots of snow and cold – "like it used to be". Quite a few roofs caved in, mainly wood sheds and outbuildings. In western Sanders County, homes had 30+ inches of snow in their yards and buildings had 18 to 24 inches on their roofs. A late season storm dumped an additional 22 inches of snow then it warmed up and turned to ice and rain. After the rain stopped, many roofs had 3+ feet of wet snow on them. Many roofs are not built to take this type of load. Approximately 60 structures collapsed during this winter; 50+ outbuildings and at least five homes were damaged.

There have been no federal or state disaster declarations associated with severe winter weather in Sanders County.

Severe Summer Weather

A severe thunderstorm is defined by the NWS as a thunderstorm that produces wind gusts at or greater than 58 mph (50 knots), hail 1-inch or larger, and/or tornadoes. Although not considered "severe", lightning and heavy rain can also accompany thunderstorms. Thunderstorms can produce intense downburst and microburst wind. In addition, strong winds, defined below, can occur outside of thunderstorms when the overall weather conditions are favorable. Tornadoes are not common in Sanders County.

The NWS provides short-term forecasts and warnings of severe summer weather to the public by producing regularly-scheduled severe weather outlooks and updates on various forms of hazardous weather including tornado warnings, as shown in **Table 4.4-3.**

Table 4.4-3. Warning and Advisory Criteria for Severe Summer Weather

Summer Weather	Weather Advisory
Hazardous Weather Outlook	Hazardous weather outlooks alert the public to the possibility for severe weather in the area from one to seven days in advance.
Severe Thunderstorm Watch	Issued when conditions for severe thunderstorms appear favorable for an area over the next several hours. Watches are typically in effect for 4-6 hours.
Severe Thunderstorm Warning	Issued when Doppler radar indicates or the public reports a thunderstorm with wind gusts of 58 mph or greater and/or hail 1-inch or larger in diameter. The warning is usually valid for 30-60 minutes.
High Wind Watch	Issued when conditions are favorable for non-thunderstorm sustained winds of 40 mph or greater or gusts of 58 mph or greater for a period of one hour or more, but the timing, location, and/ or magnitude are still uncertain.
High Wind Warning	Issued when non-thunderstorm sustained winds of 40 mph or greater or gusts of 58 mph or greater for a period of one hour or more are expected.
Tornado Watch	Issued when conditions for tornadoes appear especially favorable for an area over the next several hours. Watches are typically in effect for 4-6 hours.
Tornado Warning	Issued when Doppler radar indicates or the public reports a tornado. The warning is usually valid for 15-45 minutes.

Source: National Weather Service (NWS, 2018)

With most valleys sheltered by rugged mountains, destructive winds are infrequent in Sanders County. Sanders County has a much lower thunderstorm frequency than counties to the east, and when thunderstorms do occur, they are less forceful, on the average, than elsewhere in the State. MHMP Planning Team members indicated that lightning is the biggest concern of the summer weather hazards as it is the ignition source of many wildfires. **Table 4.4-4** presents severe summer storm events from the National Climatic Data Center indicating the magnitude of these events.

Table 4.4-4. Sanders County Severe Summer Weather Reports (~May-October)

Date	Event	Magnitude	Date	Event	Magnitude
6/1/2001	Thunderstorm Wind	52 knots	8/16/2006	Hail	1.75 inches
5/19/2002	Thunderstorm Wind	52 knots	7/17/2007	Thunderstorm Wind	55 knots
7/13/2002	Thunderstorm Wind	51 knots	7/18/2007	Hail	0.88 inches
3/14/2003	Thunderstorm Wind	53 knots	7/10/2008	High Wind	50 knots
8/19/2003	Thunderstorm Wind	51 knots	5/25/2009	Heavy Rain	-
7/19/2004	Thunderstorm Wind	60 knots	6/19/2010	Hail	1
8/6/2004	Hail	0.75 inches	7/31/2010	Hail	1
5/22/2006	Thunderstorm Wind	52 knots	8/2/2010	Hail	0.75 inches
6/13/2006	Hail	1.75 inches	8/18/2010	Heavy Rain	-
7/6/2006	Thunderstorm Wind	60 knots	10/6/2011	Heavy Rain	-
8/10/2006	Hail	0.75 inches	7/23/2014	Thunderstorm Wind	52 knots
			3/17/2017	Heavy Rain	-

Source: NCDS, 2018; Notes: "—" = No Data Reported.

MHMP Planning Team members indicated that significant damage from severe summer weather events occurs infrequently. There have been no federal or state disaster declarations associated with severe summer weather in Sanders County.

Drought

Drought is an extended period of unusually dry weather and is a special type of disaster because its occurrence does not require evacuation of an area nor does it constitute an immediate threat to life or property. People are not suddenly rendered homeless or without food and clothing. The basic effect of a drought is economic hardship, but it does, in the end, resemble other types of disasters in that victims can be deprived of their livelihoods and communities can suffer economic decline.

The effects of drought become apparent when they are in longer duration because more and more moisture-related activities are affected. Non-irrigated croplands are most susceptible to moisture shortages. Rangeland and irrigated agricultural lands do not feel the effects as quickly as the non-irrigated, cultivated acreage, but their yields can also be greatly reduced due to drought.

Typically, droughts are not declared disasters in the same way as a Presidential Disaster Declaration; rather, they are declared but by the Secretary of the Department of Agriculture. Conservation Reserve Program grazing may be opened to livestock owners for feed but other than this, the only real help for producers and growers is the fact that federal low interest loans are made available.

In periods of severe drought, range fires can destroy the economic potential of the agricultural industry, and wildlife habitat in, and adjacent to, the fire areas. Under extreme drought conditions, lakes, reservoirs, and rivers can be subject to severe water shortages. Insect infestation is an additional hazard resulting from drought. **Table 4.4-5** presents the NWS warnings and advisories that relate to drought.

Table 4.4-5. Warning and Advisory Criteria for Drought

Summer Weather Warning	Warning Description
Blowing Dust Advisory	Issued for widespread or localized blowing dust reducing visibilities to less than a mile but greater than ¼ mile with sustained winds of 25 mph or greater.
Dust Storm Warning	Issued when widespread or localized blowing dust reduces visibilities to less than ¼ mile with sustained winds of 25 mph or greater.

Table 4.4-5. Warning and Advisory Criteria for Drought

Summer Weather Warning	Warning Description
Heat Advisory	Issued when conditions are favorable for heat index values reaching 105 degrees or greater for three days or more.
Heat Warning	Issued when high temperatures are expected to be over 105 degrees and low temperatures are expected to be over 80 degrees for three days or more.

Source: National Weather Service (NWS, 2018)

The history of drought in Montana, as presented in the State of Montana Natural Hazards Mitigation Plan (DES, 2001) is summarized below.

In the 1930s, the "Dust Bowl" drought affected the State of Montana. This nationwide drought produced erosion problems in the creation of dust storms throughout the State. Again, in the mid 1950s, Montana had a period of reduced rainfall.

Drought struck again in 1961, and by July, the State's Crop and Livestock Reporting Service called it the worst drought since the 1930s. Better conservation practices such as strip cropping were used to lessen the impacts of the water shortages. Five years later in 1966, the entire state was experiencing yet another episode of drought. Although water shortages were not as great as in 1961, a study of ten weather recording stations across Montana showed all had recorded below normal precipitation amounts for a ten-month period.

Then in the 1970s, a seven-month survey ending in May of 1977 estimated that over 250,000 acres of Montana farmland had been damaged by winds. Inadequate crop cover and excessive tillage practices had resulted in exaggerated soil damage due to low soil moisture. The State of Montana began taking protective measures to conserve water.

Montana was severely affected by drought again in 1985 and received a federal drought disaster declaration. For a typical 2,500-acre Montana farm/ranch, the operator lost more than $100,000 in equity over the course of that year. The state's agriculture industry lost nearly $3 billion in equity.

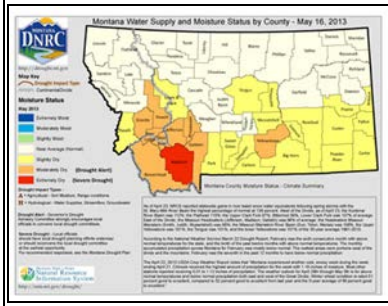
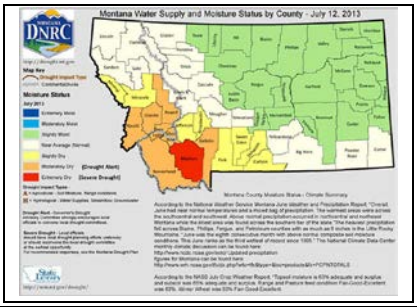
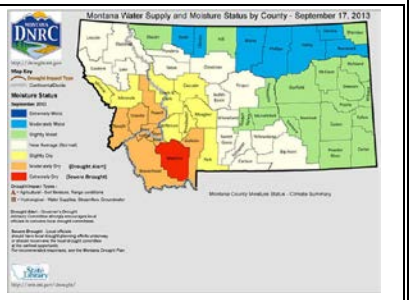
Montana had drought conditions from 2000 through 2008 and received several USDA Disaster Declarations during that time. The State of Montana received a total of $152.4 million in disaster assistance from the Farm Service Agency in 2004, 2005, and 2006.

The drought of 2017 was of epic proportions stretching 680 miles west to east across the state. This was the first summer in 10 years that so much of the state experienced drought at the same time and the first year since 2004 that more than 10 percent of the state was in extreme drought. The summer of 2017 was the second warmest on record since 1950 at 4 degrees above average, and the persistent high temperatures coupled with the record lowest rainfall in July and August shifted the relatively wet conditions of spring into extreme drought by mid-summer. The speed of the transition from wet to dry was so rapid that the term "flash drought" has been coined. (Bozeman Daily Chronical, *The Worst Drought We've Ever Had: Farmers, Ranchers Across the State Struggle with Historic Dry Spell*, September 3, 2017).

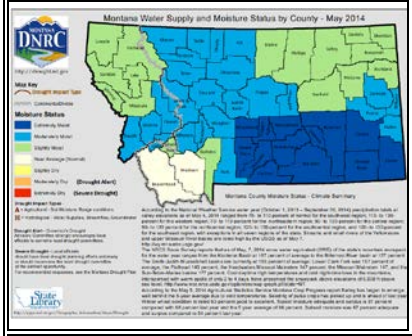
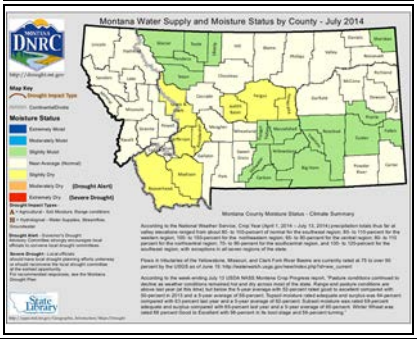
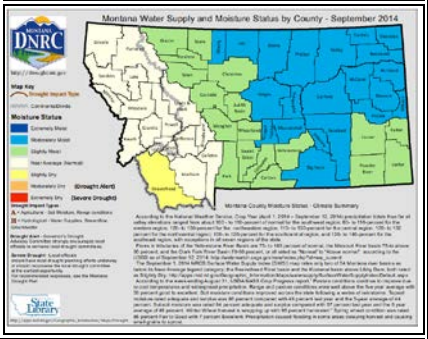
Table 4.4-6 shows the Montana drought status since the last Plan. **Table 4.4-7** summarizes drought conditions in Sanders County from 2003 to 2018. Since the Sanders County PDM Plan was completed in 2012, severe drought conditions impacted the county in 2015 and 2017.

Table 4.4-6. Montana Drought Status; 2013-2018

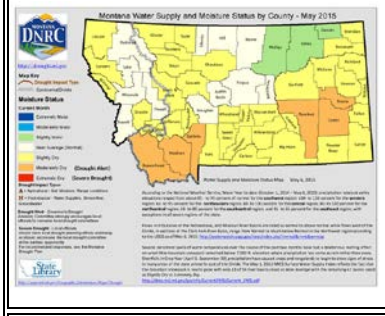
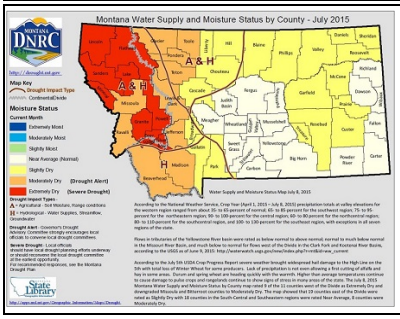
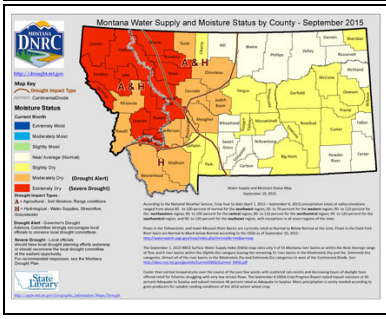
2013 Montana County Drought Status

May	July	September
		

2014 Montana County Drought Status

May	July	September
		

2015 Montana County Drought Status

May	July	September
		

2016 Montana County Drought Status

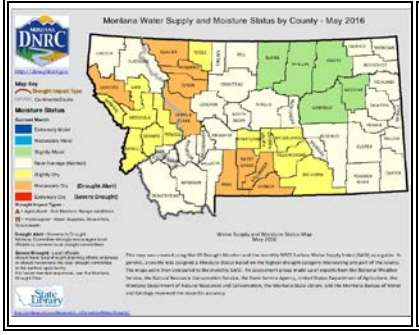
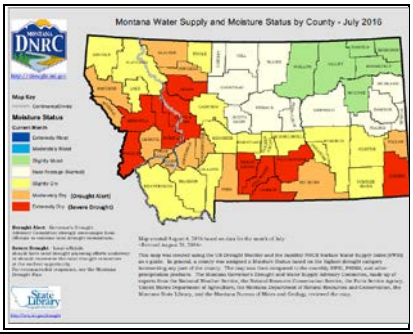
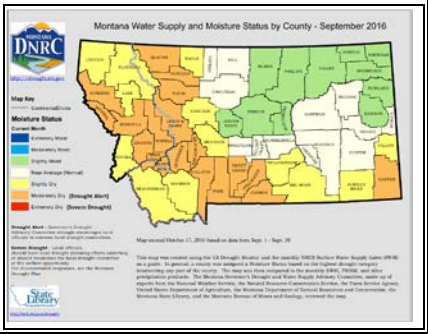
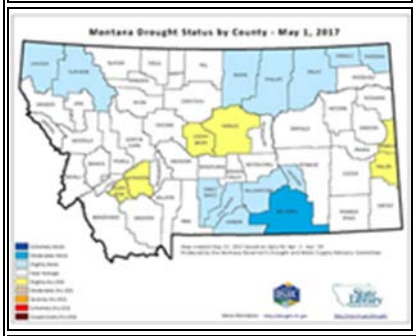
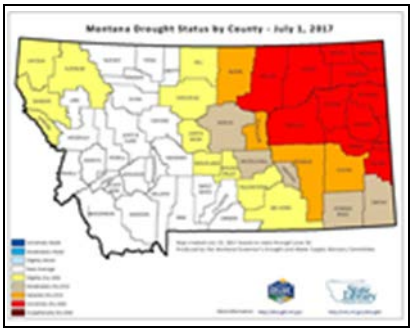
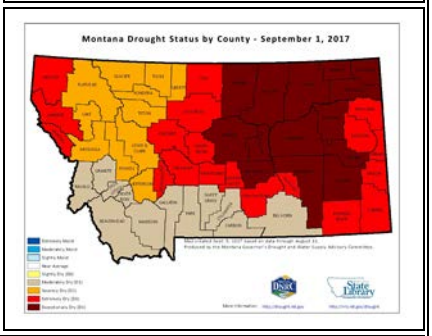
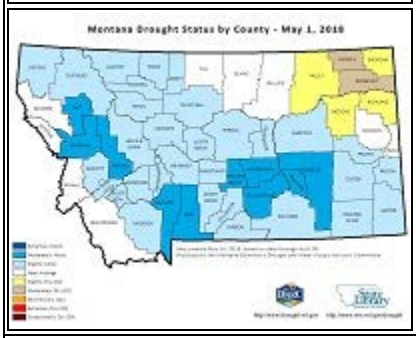
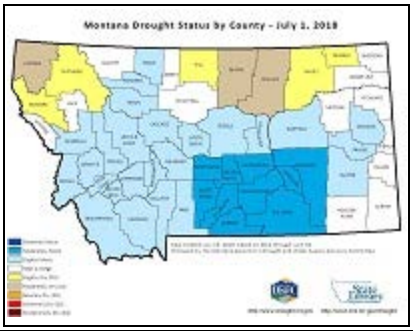
May	July	September
		

Table 4.4-6. Montana Drought Status; 2013-2018

2017 Montana County Drought Status

May	July	September
		

2018 Montana County Drought Status

May	July	September
		

Source: Montana Drought Website (https://mslservices.mt.gov/Geographic_Information/Maps/drought/).

Table 4.4-7. Sanders County Drought Summary

Moisture	Alerts	2003			2004			2005			2006			2007			2008			2009			2010		
		May	July	Sept	May	July	Sept	May	July	Sept	May	July	Sept	May	July	Sept	May	July	Sept	May	July	Sept	May	July	Sept
No Drought	Moist																								
No Drought																									
Slightly Dry																									
Moderately Dry	Drought Alert																								
Severely Dry	Severe Drought																								
Extremely Dry																									

Moisture	Alerts	2011			2012			2013			2014			2015			2016			2017			2018		
		May	July	Sept	May	July	Sept	May	July	Sept	May	July	Sept	May	July	Sept	May	July	Sept	May	July	Sept	May	July	Sept
Extremely Moist																									
Moderately Moist																									
Slightly Moist																									
Near Average	Normal																								
Slightly Dry																									
Moderately Dry	Drought Alert																								
Extremely Dry	Severe Drought																								

Information from the National Drought Mitigation Center identifies Montana as a drought prone state. Temperatures can reach 100°F in the summer with extremely low humidities and high winds. Such dry, hot conditions contribute to drought conditions. The State of Montana established a Drought Advisory Committee and developed a Drought Plan to address the hazard. Sanders County also has a Drought Committee made up of local, state and federal agency representatives from the region who work with the agricultural community as well as municipalities to determine when mandatory conservation is necessary.

Vulnerability and Area of Impact

Although the west end of Sanders County generally receives more snow than the eastern portion, the entire county has been classified with a uniform risk for severe weather events. Structures, utilities and human health are most at risk from the heavy snow component of severe winter weather.

Drought affects all facets of our society, from food production to water quality to public health, and there is a growing need to help communities, agriculture, businesses, and individuals threatened by drought to plan accordingly. From 1980-2000, major droughts and heat waves within the U.S. alone resulted in costs exceeding $100 billion. In 2012, approximately two-thirds of the continental U.S. was affected by chronic drought. Severe droughts are projected for the next several decades, impacting the nation's communities and economy (NDRP, 2016).

Drought is a hazard that does not normally cause structural damage but can have significant population and economic effects. A drought or blight could also have significant impacts on the agricultural community. Economic losses could result from loss of pasture and food supply for livestock. These losses would be in addition to those losses associated with lower crop yields due to drought conditions.

Another major impact of drought is to the natural resources of the area. As river and stream levels drop, fish populations and other natural resources are impacted. A hazard directly related to drought is wildfire. Drought conditions increase the chances that a major wildfire will threaten the community. Unlike many other events, drought evolves slowly, and therefore, the direct impact to the population (i.e. loss of life, injuries) would be low.

On March 21, 2016, President Obama signed a Presidential Memorandum directing Federal agencies to build national capabilities for long-term drought resilience. The President tasked the National Drought Resilience Partnership (NDRP) to work collaboratively to deliver on a Federal Action Plan including six goals and 27 associated actions to promote drought resilience nationwide. Importantly, these goals reflect many of the priorities identified by the on-the-ground leaders and experts who work daily to build a more resilient future for their communities. The actions are designed to complement state, regional, tribal and local drought preparedness, planning and implementation efforts.

Federal agencies have mobilized to provide improved information and data, emergency and planning assistance, landscape-scale land management improvements, and investments in new technologies and approaches to water resource management. Continued drought conditions in the west and projections of more extreme droughts in the future underscore the urgency to pursue long term solutions for protecting our water resources and the communities and ecosystems that depend on them.

Probability and Magnitude

According to the 2018 State of Montana MHMP, Sanders County ranks #10 among the state's 56 counties for sustaining the most damages from winter weather. **Tables 4.4-8 and 4.4-9** present severe weather events with reported damages from winter and summer events, respectively, from the SHELDUS database. The dataset used to populate SHELDUS typically includes every loss causing and/or deadly event between 1960 through 1975 and from 1995 onward. Between 1976 and 1995,

SHELDUS reflects only events that caused at least one fatality or more than $50,000 in property or crop damages. In order to compensate for the under-reporting of losses in general and to provide more loss information for rural counties, SHELDUS now reports USDA data, which are all insured losses, i.e. disaster crop insurance payments by USDA.

Table 4.4-8. Sanders County Severe Winter Weather Events with Damages

Date	Injuries	Fatalities	Property Damage (2016 $)	Crop Damage (2016 $)	Remarks
1/1961	0	0	$10,216	$0	Winter Weather
5/1961	0	0	$4,541	$0	Winter Weather
11/1962	0	0	$7,098	$0	Wind
12/1964	0	0	$69,150	$0	Wind & Winter Weather
1/1967	0	0	$6,418	$0	Wind
4/1968	0	0	$39,012	$0	Wind
1/1969	0	0	$584	$0	Winter Weather
11/1970	0	1	$0	$0	Winter Weather
3/1971	0	0	$1,006	$0	Wind & Winter Weather
11/1971	0	0	$1,117	$0	Winter Weather
1/1972	0	0	$14,872	$0	Wind
12/1972	0	0	$1,008	$0	Wind
3/1972	0	0	$974	$0	Wind
1/1974	0	0	$4,426	$0	Wind
12/1974	0	0	$855	$0	Wind
10/1975	0	0	$2,271,127	$22,711	Winter Weather
4/1987	0	0	$17,926	$0	Wind
12/1987	0	0	$120	$0	Winter Weather
1/1988	0	0	$10	$0	Winter Weather
2/1988	0	0	$184	$0	Wind
12/1988	0	0	$25,821	$0	Wind
1/1989	0	0	$27,372	$274	Winter Weather
2/1989	0	0	$172,873	$173	Winter Weather
1/1990	0	0	$9,349	$0	Winter Weather
2/1990	0	0	$2,337	$0	Wind
3/1990	0	0	$203	$0	Winter Weather
4/1990	0	0	$2,921	$0	Winter Weather
6/1990	0	0	$93	$0	Winter Weather
11/1990	0	0	$40,114	$5,499	Wind
12/1990	0	0	$49,314	$0	Winter Weather
11/1991	0	0	$2,243	$0	Winter Weather
8/1992	0	0	$742	$75,680	Winter Weather
12/1992	0	0	$2,235	$0	Wind & Winter Weather
1/1993	0	0	$4,489	$0	Winter Weather
6/1993	0	0	$4,228	$0	Winter Weather
10/1993	0	0	$9,395	$0	Winter Weather
11/1993	0	0	$21,140	$0	Winter Weather
12/1993	0	0	$211	$0	Winter Weather
2/1994	0	0	$17,213	$0	Winter Weather
4/1994	0	0	$6,871	$0	Winter Weather
11/1994	0	0	$18,649	$0	Winter Weather
1/1995	0	0	$2,004	$0	Winter Weather
3/1995	0	0	$80,175	$0	Winter Weather
12/1995	0	0	$16,035	$0	Wind
3/2003	1	0	$3,320	$0	Wind
12/2006	0	0	$1,347	$0	Wind
6/2008	0	0	$103	$0	Winter Weather

Table 4.4-8. Sanders County Severe Winter Weather Events with Damages

Date	Injuries	Fatalities	Property Damage (2016 $)	Crop Damage (2016 $)	Remarks
11/2008	0	0	$9,459	$0	Wind
12/2008	0	0	$56,751	$0	Winter Weather
1/2009	0	0	$1,424	$0	Winter Weather
4/2010	0	0	$5,230	$0	Wind
1/2011	0	0	$1,086	$0	Winter Weather
2/2011	0	0	$15,210	$0	Wind
3/2012	0	0	$3,690	$1,171	Wind & Winter Weather
4/2013	0	0	$1,399	$0	Wind
1/2014	0	0	$688	$0	Wind
11/2014	0	0	$32,688	$0	Winter Weather
1/2015	0	0	$687	$0	Winter Weather
11/2015	0	0	$78,702	$0	Wind & Winter Weather
TOTAL	**1**	**1**	**$3,178,456**	**$105,508**	

Source: SHELDUS, 2017 (adjusted to 2016 dollars). Notes: * = USDA Indemnity Payment

Snow generally does not cause the communities to shut down or disrupt activities. Occasionally, though, extreme winter weather conditions can cause problems. The most common incident in these conditions are medical emergencies due to isolation and power outages. Motor vehicle accidents due to poor road conditions can also occur. Such incidents normally involve passenger vehicles; however, an incident involving a commercial vehicle transporting hazardous materials or a vulnerable population such as a school bus is also possible.

Sheltering of community members could present significant logistical problems when maintained over a period of more than a day. Transportation, communication, energy (electric and vehicle fuels), shelter supplies, medical care, food availability and preparation, and sanitation issues all become exceedingly difficult to manage in extreme weather conditions. Local government resources could be quickly overwhelmed.

Table 4.4-9 presents severe summer weather events with reported damages since 1960 in Sanders County from the SHELDUS database.

Table 4.4-9. Sanders County Severe Summer Weather Events with Damages

Date	Injuries	Fatalities	Property Damage (2016 $)	Crop Damage (2016 $)	Remarks
6/1964	0	1	$0	$0	Severe Storm/Thunder Storm
7/1964	1	0	$394	$0	Lightning
6/1965	0	0	$2,042	$204,154	Hail & Wind
7/1968	0	0	$1,210	$0	Severe Storm/Thunderstorm/Wind
1/1969	0	0	$6	$0	Lightning
8/1971	0	0	$30,170	$0	Wind
9/1971	0	0	$1,775	$0	Wind
9/1973	0	0	$17	$0	Wind
7/1974	0	0	$826	$0	Severe Storm/Thunderstorm/Wind
7/1976	1	0	$0	$0	Lightning
6/1977	0	0	$33,605	$0	Wind
5/1980	0	0	$24,714	$0	Severe Storm/Thunderstorm
6/1985	0	0	$2,640	$2,640	Hail & Wind
6/1986	0	0	$5,574	$557,421	Hail
4/1987	0	0	$17,926	$0	Severe Storm/Thunderstorm

Table 4.4-9. Sanders County Severe Summer Weather Events with Damages

Date	Injuries	Fatalities	Property Damage (2016 $)	Crop Damage (2016 $)	Remarks
6/1987	0	0	$3,586	$358	Severe Storm/Thunderstorm/Wind
8/1989	0	0	$98,538	$9,854	Severe Storm/Thunderstorm/Wind
101991	0	0	$175,904	$0	Wind
5/1992	0	0	$87	$0	Wind
5/1993	0	0	$2,537	$0	Severe Storm/Thunderstorm/Hail
7/1993	0	0	$8,456	$8,456	Hail
10/1993	0	0	$1,208	$0	Wind
5/1994	0	0	$8,244	$0	Severe Storm/Thunderstorm/Wind
3/2003	1	0	$3,320	$0	Severe Storm/Thunderstorm
7/2007	0	0	$35,358	$0	Severe Storm/Thunderstorm/Wind
10/2008	0	0	$3,263	$0	Wind
10/2009	0	0	$18,985	$0	Wind
5/2010	0	0	$11,207	$0	Wind
8/2012	0	0	$4,257	$0	Wind
10/2012	0	0	$4,967	$6,386	Wind
5/2013	0	0	$1,224	$0	Wind
8/2013	0	0	$1,050	$0	Severe Storm/Thunderstorm/Wind
10/2013	0	0	$874	$0	Wind
8/2014	0	0	$688	$0	Wind
9/2014	0	0	$172	$0	Wind
5/2016	0	0	$0	$0	Wind
8/2016	0	0	$0	$0	Wind
TOTAL	**3**	**1**	**$504,824**	**$789,271**	

Source: SHELDUS, 2017 (adjusted to 2016 dollars).

Windstorms affect areas with significant tree stands, as well as areas with exposed property, major infrastructure, and aboveground utility lines. Lightning can ignite wildfires and extreme heat/low humidity can fuel drought conditions. Though structure loss is rare, economic impacts can be significant.

Annual loss was computed for the severe summer and winter weather hazard in Sanders County using SHELDUS data and the formula: Frequency x Magnitude x Exposure = Annual Loss, as further explained in *Section 4.1.6*. **Table 4.4-10** presents the results of the calculations.

Table 4.4-10. Sanders County Severe Weather Annual Loss

No. of Events	Period of Record	Frequency	Property Damage	Magnitude	Exposure	Annual Loss
96	56	1.714286	$3,683,280	0.0045%	$861,232,311	$65,773

Severe weather occurs in Sanders County multiple times each year. Therefore, the probability of a severe storm in either the winter or summer is rated as "highly likely". The MHMP Planning Team ranked both the severe winter and summer weather hazards as "likely", where damaging events occur more than once a decade but not every year.

The National Drought Mitigation Center tracks indemnity payments for losses suffered due to drought on a county basis. **Table 4.3-11** presents drought damages for a 25-year period (1989 to 2014) for Sanders County and the State of Montana.

Table 4.3-11. Drought Insurance Claims; 1989 - 2014

Year	Montana	Sanders Co.	Year	Montana	Sanders Co.	Year	Montana	Sanders Co.
1989	$14,361,948	$2,210	1998	$18,201,060	$0	2007	$22,015,676	$7,251
1990	$29,146,575	$843	1999	$19,189,328	$6,268	2008	$74,979,811	$11,405
1991	$2,775,746	$0	2000	$44,989,149	$0	2009	$30,435,526	$6,595
1992	$37,767,835	$1,201	2001	$131,976,513	$1,050	2010	$5,289,266	$3,481
1993	$344,432	$0	2002	$108,139,519	$0	2011	$52,075,321	$0
1994	$5,539,598	$423	2003	$41,148,170	$5,096	2012	$10,055,101	$0
1995	$2,413,758	$0	2004	$29,427,194	$3,623	2011	$11,670,134	$4,631
1996	$10,637,521	$0	2005	$5,905,724	$8,881	2014	$5,289,266	$0
1997	$3,830,310	$0	2006	$41,483,327	$0	**TOTAL**	**$759,087,808**	**$62,958**

Source: National Drought Mitigation Center, 2018;
https://drought.unl.edu/droughtplanning/DroughtImpacts/IndemnityData.aspx

The NOAA's Paleoclimatology Program has studied drought by analyzing records from tree rings, lake and dune sediments, archaeological remains, historical documents, and other environmental indicators to obtain a broader picture of the frequency of droughts in the United States. According to their research, "…paleoclimatic data suggest that droughts as severe as the 1950s drought have occurred in central North America several times a century over the past 300-400 years, and thus we should expect (and plan for) similar droughts in the future. The paleoclimatic record also indicates that droughts of a much greater duration than any in the 20th century have occurred in parts of North America as recently as 500 years ago." Based on this research, the 1950s drought situation could be expected approximately once every 50 years or 20 percent chance every 10 years. An extreme drought, worse than the 1930s "Dust Bowl" has an approximate probability of occurring once every 500 years or a 2 percent chance of occurring each decade (NOAA, 2004).

Future Development

The State of Montana has adopted the 2012 International Building Codes (IBC) which include a provision that buildings must be constructed to withstand a wind load of 75 mph constant velocity and three second gusts of 90 mph and must be designed to withstand a snow load of 30 pounds per square foot minimum. The IBC does not cover single-family residences.

The State of Montana has adopted the 2012 International Residential Code (IRC) for one and two-family residences and townhouses. Local jurisdictions (cities, counties and towns) can elect to become certified to take on enforcement of single-family residences. None of the incorporated communities in Sander County have certified building inspectors to enforce building codes. In addition, Sanders County does not have a building department and also has no enforcement capabilities to ensure State building codes are followed.

Drought could have an effect on future development with regards to groundwater availability. New domestic water wells and sewer systems could use up more of the groundwater resource, particularly during periods of drought.

Climate Change

The frequency of severe weather events has increased steadily over the last century. The number of weather-related disasters during the 1990s was four times that of the 1950s, and cost 14 times as much in economic losses. Historical data shows that the probability for severe weather events

increases in a warmer climate. There has been a sizable upward trend in the number of storms causing large financial and other losses.

According to the National Climate Change Assessment (GlobalChange.gov, 2018), climate change can and has altered the risk of certain types of extreme weather events. The number of heat waves has been increasing in recent years with the number being almost triple the long-term average. These increases in extreme heat will have many negative consequences, including increases in surface water losses, heat stress, and demand for air conditioning. Montana has seen an uptick in average temperature of about 2 degrees F in the last 50 years, while precipitation has stayed largely the same.

Rising temperatures are leading to increased demand for water and energy. In parts of the region, this will constrain development, stress natural resources, and increase competition for water among communities, agriculture, energy production, and ecological needs. Changes in average temperatures can impact vegetation growth and the location and extent of pests. Higher temperatures may also lead to increases in wildfire occurrences. Extreme heat will have a profound effect on vulnerable populations, as most Montana homes do not have air conditioning.

Changing extremes in precipitation are projected across all seasons, including higher likelihoods of both increasing heavy rain and snow events. Winter and spring precipitation is projected to increase in the northern states of the Great Plains, relative to the 1971-2000 average. Winter storms have increased in frequency and intensity since the 1950s, and their tracks have shifted northward over the United States. Projected changes in summer and fall precipitation are small; however, the number of days with heavy precipitation is expected to increase by mid-century. For other types of extreme weather events, such as tornadoes and severe thunderstorms, more research is needed to understand how climate change will affect them.

The effects of climate change can harm agricultural activities, both crops and livestock. The changes in temperature and precipitation brought on by climate change can make it harder to grow some crops. Evaporation and the higher rate at which plants lose moisture through their leaves both increase with temperature. Unless higher evapotranspiration rates are matched by increases in precipitation, environments will tend to dry, promoting drought conditions. Intense rains can increase runoff and deprive plants of nutrient-rich topsoil and changes in temperatures may cause crops to mature earlier, which can expose them to harsh weather. Warmer temperatures can introduce new agricultural pests to the region or make conditions better for pests already present, including weeds and invasive plants that can crowd out crops. Maintaining agricultural activities on marginal lands may no longer be sustainable (FEMA, 2016).

Maintaining stream flows during warm season months will likely necessitate reconsideration of water storage practices and reservoir management. Changing seasonality of water availability will likely put additional stress on the water rights system, making it difficult to access water at crucial times (Whitlock, et.al, 2017).

Population exposure and vulnerability to severe weather and drought are likely to increase as a result of climate change. Severe weather events may occur more frequently which would lead to increased exposure and vulnerability. Although all people may be affected by the health-related impacts of climate change, the elderly, young children, and people with weakened immune systems are often the most susceptible. Some people without access to backup water supplies may suffer water

shortages and a greater number of people may need to engage in behavior change such as water conservation.

Property exposure and vulnerability may increase as a result of increased severe weather and drought resulting from climate change. Increased structure damage from high winds, hail and snow load could result as well as damage to crops and landscaping. Secondary impacts, such as wildfire, may increase and threaten structures.

Critical facility exposure and vulnerability are unlikely to increase as a result of climate change impacts associated with severe weather and drought; however, critical facility owners and operators may experience more frequent disruption to the services they provide. For example, extreme heat can decrease the effectiveness of electrical equipment, including power lines, which can lead to blackouts during very hot conditions. An increase in requests for medical assistance during a heat wave may challenge emergency response capabilities. The need for community cooling centers could result in an increase in number of critical facilities.

4.5 Flooding

CPRI SCORE = 2.5

Description and History

A flood is a natural event for rivers and streams. Excess water from snowmelt and rainfall accumulates and overflows onto the banks and adjacent floodplains. Floodplains are lowlands, adjacent to rivers and lakes that are subject to recurring floods. A flash flood generally results from a torrential (short duration) rain or cloudburst on a relatively small drainage area. Ice jam flooding occurs when pieces of floating ice carried by the streams current accumulate at an obstruction to the river. The water held back can cause flooding upstream, and if the obstruction suddenly breaks, flash flooding can then occur downstream as well. Flash floods and debris flows have the potential to occur after a wildfire, as further described in the Landslide profile in *Section 4.8*. Dam failure flooding is included as a separate hazard profile in *Section 4.9*.

Warming periods, which may be accompanied by rainfall, cause tributaries to swell rapidly. The resulting flood flows may be localized or basin-wide and may last from hours to several days depending on temperature, amount of rainfall, soil moisture content, and soil permeability. Rain on snow events are also a source of flooding in Sanders County.

The National Weather Service provides short-term forecasts and warnings of hazardous weather to the public by producing regularly-scheduled severe weather outlooks and updates on various forms of hazardous weather including heavy rain and flooding. A "watch" is issued when conditions are favorable for severe weather in or near the watch area. A "warning" is issued when the severe weather event is imminent or occurring in the warned area. Warning and Advisory Criteria for flooding is presented in **Table 4.5-1.**

Table 4.5-1. Warning and Advisory Criteria for Flooding

Flooding	Warning Description
Flash Flood Watch	Issued when conditions are favorable for flash flooding. It does not mean that flash flooding will occur, but it is possible
Flash Flood Warning	Flash flooding is imminent, water levels rise rapidly with inundation occurring in less than 6 hours.
Flood Watch	Issues when conditions are favorable for flooding. It does not mean flooding will occur, but it is possible.
Flood Warning	Flooding is expected to occur more than 6 hours after the causative event.

Source: National Weather Service, 2018

Major floods have occurred in Sanders County in 1948, 1964, 1975, 1996, and 1997. Only the flood of 1996 resulted from ice jamming (FEMA, 2012). Federal disaster declarations from flooding were declared in Sanders County in 1974, 1986, 1996, 1997, and 2014 (DES, 2018). Several of these floods are discussed below.

June 1948 - The flood of June 1948 was the result of heavy snow runoff augmented by rain. Above normal precipitation for two successive months and cool temperatures into mid-May increased the water content of the above normal snowpack and delayed its melting. Temperatures began increasing on May 15th and reached the mid-70's at Missoula on the 16th and 17th. Rain began falling on the 19th and continued intermittently through the 23rd. Flows in some streams west of the Continental Divide were the highest in over 40 years.

June 1974 - One of the most damaging floods in northwestern Montana was the June 1974 flood. An unusually cold spring delayed melting of a record snowpack in the Rocky Mountains. Snow surveys indicated that the snowpack was generally 150 to 200 percent of normal. On June 8th, temperatures in the mountains rose to the high 40s and 50s. A day earlier, on June 7th, heavy rains started around noon and continued until the evening of the 8th (a total of about 30 hours). The Clark Fork Basin was on the fringe of the storm system however, and the flows near Plains were not as great in magnitude as experienced in the Flathead Basin.

June 1975 - A late spring caused an unusually heavy snowpack to be carried over into May. From the 10th through 16th of June, temperatures ranged up to 13 degrees above normal. Heavy rains fell along the Continental Divide in the Flathead Basin, similar to the June 1964 flood; however, the storm was not as intense, and flooding on the Clark Fork River was primarily from snowmelt.

February 1996 - An ice jam 12 miles in length formed at two locations above Thompson Falls. One was at the bedrock channel constriction one mile upstream of the dam, and the second was at the island filled area, eight miles upstream of Thompson Falls. Upstream of the island area, the jam flooded farms and a four-mile stretch of Highway 200 in the Eddy Flats area. Above Eddy Flats, the river washed away 500 feet of railroad track causing the derailment of two freight trains. At the island area, 60 plus acres of ice remained, covering the islands and many of the connecting channels. The ice size ranged from slush ice to broken sheets that were 10 to 20 feet wide and up to a foot thick. On Saturday the 10th, the toe of the jam shifted and moved several yards downstream past the island area. On Wednesday the 14th, the jam broke and ice began to move as one. Operators at the Thompson Falls Dam opened a central gate to its maximum, in an effort to pass as much of the ice and debris as possible so it wouldn't cause any damage to the hydroelectric station to the right of the dam. A debris boom designed to funnel ice to the central locally gate failed and was swept against a steel bridge. Beaver Creek Road was completely washed out and Blue Slide Road was closed due to the uncertainty of the ground beneath the road.

May 2011 – About 200 yards of the Vermillion River Road became part of the Vermillion River due to flooding. The water over the road was over three feet deep in some places. To get to and from their home, two full-time residents above the flood had to drive the water, hike up the side of a mountain and back down to the other side, where they kept another vehicle. Another road closure along the Thompson River affected other Sanders County residents but a Plum Creek Road offered a detour around that flooded area. (Missoulian, *Sanders County's Vermillion River Floods, Cuts off Home*, May 26, 2011). The U.S. Army Corps of Engineers (USACE) sent a representative to look at the levee near the Clark Fork River that failed and allowed water to surround the town's sewage lagoons. The flood waters did not damage the banks around the lagoons or otherwise flush sewage outside the banks. The biggest thing was access to the lagoons. Water was 18 to 20 inches deep over the access road. Floodwaters breached an old levee on private property in the area and flooded the land around the lagoons. The USACE stabilized that levee to release some of the stress on the sewage lagoons. Elsewhere in Sanders County, Lower Lynch Creek Road remained closed because of water over the road, and River Road, which runs on the south side of the Clark Fork between Plains and Paradise, was closed to all but local traffic. Crews worked 24/7 to keep all the debris carried down the Clark Fork moving through the gates at Thompson Falls Dam. Crews were using cranes on top of the dam to both cut and guide debris through the gates. (Ravalli Republic, *Army Corps of Engineers Examine Failed Levee in Plains*, June 10, 2011).

Vulnerability and Area of Impact

The Clark Fork and Flathead Rivers are controlled by dams but still experience occasional flooding. The worst flooding in Sanders County is the Clark Fork River upstream of Thompson Falls, including the Town of Plains where there is typically an annual flood event. High flows at Plains threaten the water treatment plant and rip-rap has been placed to protect the town's lagoons. MHMP Planning Team members indicated that small streams also cause flood problems in Sanders County including Blue Slide and White Pine creeks. White Pine Creek flooding has caused road damage and isolated a residence. A culvert failure on Blue Slide Road caused road damage.

MHMP Planning Team members indicated that ice jam flooding impacted Hot Springs about 20 years ago and flash flooding occurs about every five years. At North Road crossing, four feet of flood water inundated the intersection twice in the past 10 years and took out a county bridge at Ekblad Road.

Development in floodplains results in a concurrent risk of property damage due to floods and impacts on city services for risk protection during flood season. **Figures 7, 7A, 7B and 7C** present the regulated floodplains within Sanders County, Thompson Falls, Plains, and Hot Springs, respectively.

There is an increased risk of flooding during heavy rains after wildfire because the burned ground is unable to absorb the falling rain, producing runoff conditions much like a parking lot. Because of this, even modest rainstorms over a burned area can result in flash flooding downstream. These floods are typically much larger for a given sized storm than they were before the wildfire, so flooding is likely to be much more extensive following wildfire, endangering properties previously considered safe from flooding. These floodwaters typically transport surface debris such as down trees, boulders, and gravel.

Floodplain and Floodway Management

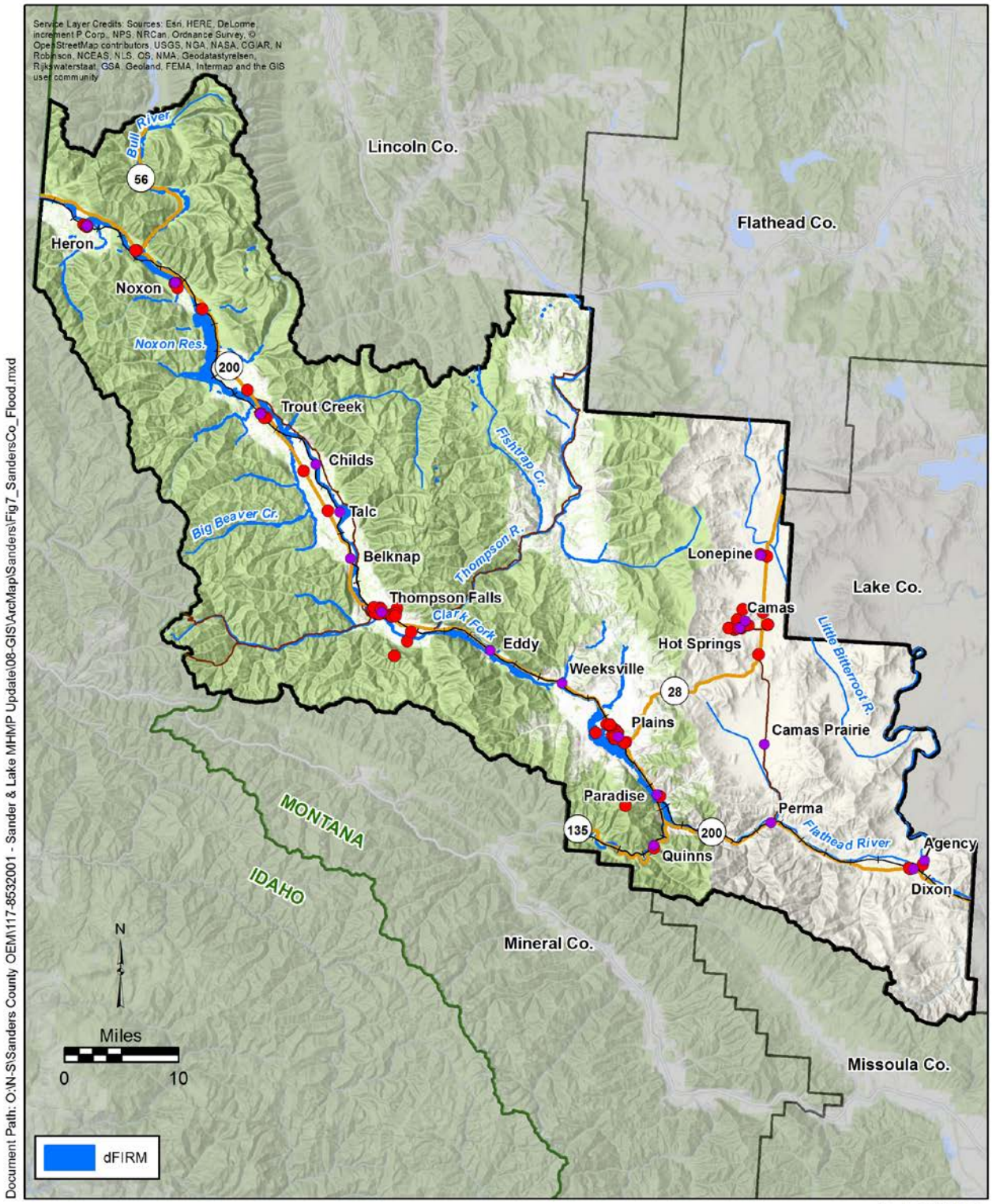
Digital Flood Insurance Rate Maps (DFIRMs) for Sanders County were adopted in 2012. The maps distinguish floodplains, floodways and floodway fringes. The floodway is the highest risk area consisting of stream channels and banks where most damage and destruction occurs. Residential and commercial development, mobile homes and septic systems are prohibited in this area. MHMP Planning Team members indicated that a reach study was completed from Henry Creek to Lynch Creek.

The National Flood Insurance Program (NFIP) encourages local governments to adopt "sound" floodplain management programs to reduce private and public property losses due to floods. Sanders County, and the towns of Plains and Hot Springs participate in the NFIP. **Table 4.5-2** presents statistics on flood insurance policies and losses.

Table 4.5-2. National Flood Insurance Program Statistics (through 8/31/2018)

Jurisdictions	Policies in Force	Insurance in Force	Number of Losses	Total Payments
Sanders County	36	$7,076,300	9	$233,490
Town of Plains	5	$756,900	1	$0
Town of Hot Springs	5	$422,500	0	-

Source: FEMA, 2018. http://bsa.nfipstat.fema.gov/reports/1011.htm#MTT; http://bsa.nfipstat.fema.gov/reports/1040.htm#30



Date: 2/4/2019

Figure 7

Flood Hazard Area

Sanders County, Montana

Multi-Hazard Mitigation Plan

Legend

- Town
- Critical Facility
- Railroad
- MT Highway
- Secondary Road
- River
- Lake/Reservoir
- County Boundary

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Date: 2/4/2019

Legend

- Critical Facility
- dFIRM

Figure 7A
Thompson Falls - Flood Hazard Area
Sanders County, Montana
Multi-Hazard Mitigation Plan

Figure 7B
Plains - Flood Hazard Area
Sanders County, Montana
Multi-Hazard Mitigation Plan

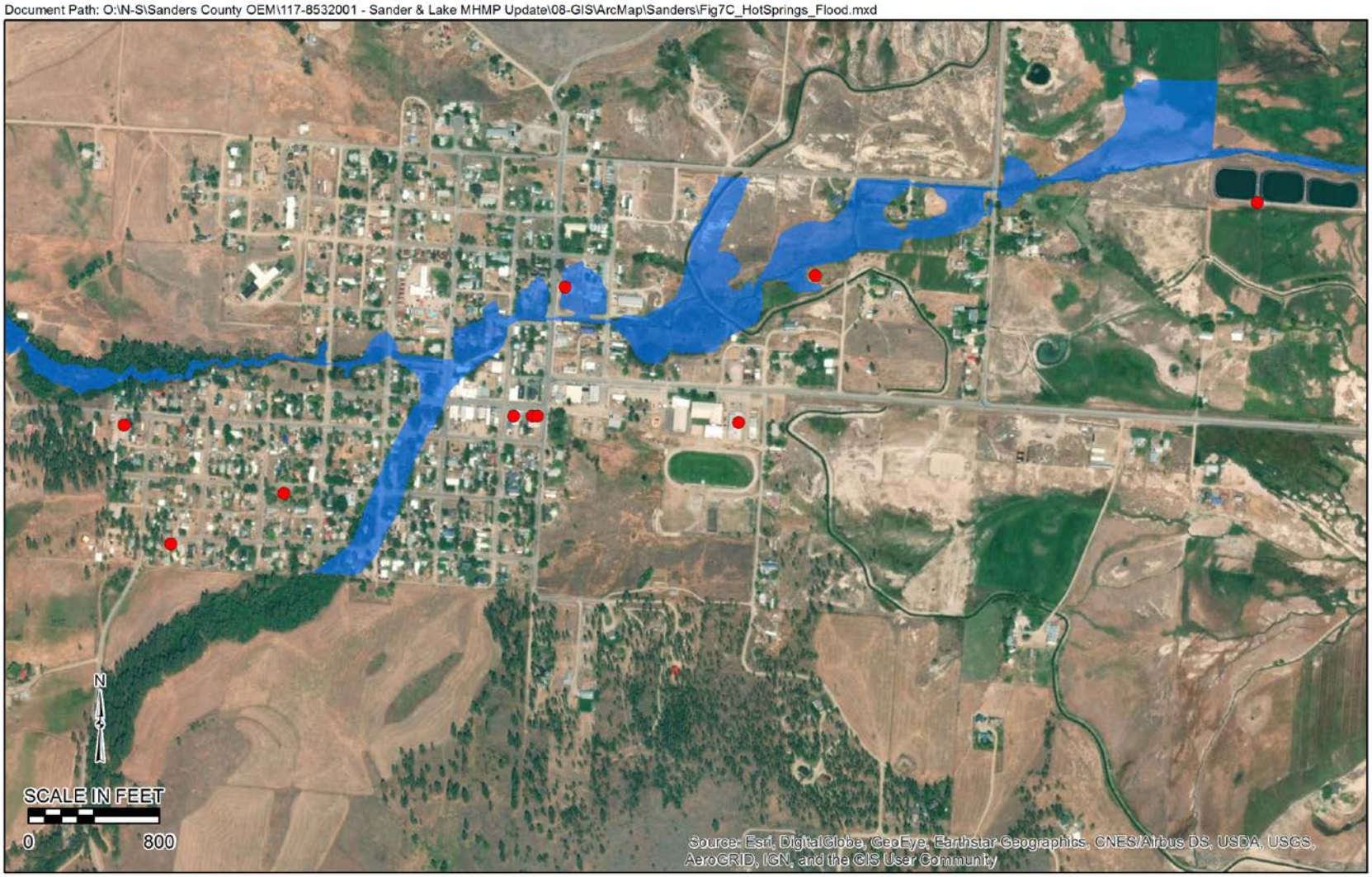


Figure 7C
Hot Springs - Flood Hazard Area
Sanders County, Montana
Multi-Hazard Mitigation Plan

Thompson Falls does not participate in the NFIP. This is because there is no area within the city limits that are in a floodplain. The city is located on a hillside and next to a reservoir that is controlled by the Thompson Falls Dam. The depth of the pool is defined by the height of the dam. Before Thompson Falls would flood the water would spill over the dam. There is no chance that residents would benefit by being insured as there is not a likelihood that an insurable event could ever occur within the city limits.

There are no NFIP repetitive loss properties in Sanders County, Plains, or Hot Springs. A repetitive loss property is any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling 10-year period, since 1978. There are no severe repetitive loss properties in Sanders County. Severe repetitive loss properties have had at least four NFIP claim payments over $5,000 each and the cumulative amount exceeding $20,000; or, where at least two separate claim payments have been made with the cumulative amount exceeding the market value of the building.

The NFIP's Community Rating System (CRS) recognizes community efforts (beyond minimum standards) by reducing flood insurance premiums for the community's property owners. CRS discounts on flood insurance premiums range from 5 percent up to 45 percent. Those discounts provide an incentive for new flood protection activities that can help save lives and property in the event of a flood. To participate in the CRS, a community can choose to undertake some of the 18 public information and floodplain management activities. Based on the total number of points a community earns, the CRS assigns you to one of ten classes. The discount on flood insurance premiums is based on your class. Neither Sanders County nor the communities of Plains or Hot Springs participate in the CRS.

Flood Protection Measures

FEMA published a Flood Insurance Study for Sanders County and the Incorporated Areas in 2012. (FEMA, 2012). This study indicates that the highway between Thompson Falls and Plains has been raised to reduce flood damage.

There are also several levees in Sanders County that offer flood protection, including the 1948 Plains levee and the new Helterline levee. The Plains levee Segment 2 (from the bridge upstream past White's) was inspected and certified by the USACE. Segment 1 is up for inspection and certification. The Helterline levee is a new levee in Plains. It was rebuilt in 2011 with additional work done in 2017 to extend it further. The USACE has been assisting the Town of Plains and Sanders County with implementing emergency protective measures to reduce the risk of scour on the 1948 levee at Plains.

Probability and Magnitude

It is estimated that flooding causes 90 percent of all property losses from natural disasters in the United States and kill an average of 150 people a year nationwide. Most injuries and deaths occur when people are swept away by flood currents and most property damage results from inundation by sediment-laden water. Faster moving floodwater can wash buildings off their foundations and sweep vehicles downstream. Pipelines, bridges, and other infrastructure can be damaged when high water combines with flood debris. Basement flooding can cause extensive damage to the structure and systems of a building.

Flood listings with associated property damage from the SHELDUS database and Montana DES are presented in **Table 4.5-3**.

Table 4.5-3. Sanders County Flood Events with Damages

Date	Injuries	Fatalities	Property Damage	Crop Damage	Date	Injuries	Fatalities	Property Damage	Crop Damage
3/1969	0	0	$5,841	$0	3/1995	0	0	$26,725	$0
2/1986	0	0	$29,338	$0	6/1995	0	0	$187,075	$0
7/1989	0	0	$2,463	$2,463	5/1997	0	0	$318,357	$0
11/1990	0	0	$23,372	$0	5/1998	0	0	$28,985	$0
5/1991	0	0	$22,428	$0	6/2005	0	0	$219,285	$0
6/1991	0	0	$641	$0	8/2010	0	0	$16,810	$0
1/1995	0	0	$100	$0	3/2014	0	0	$4,129	$0
					TOTAL			**$885,549**	**$2,463**

Source: SHELDUS, 2017; DES, 2018.

The flood hazard impact map used for the MHMP analysis consisted of the regulated floodplain, as depicted on the current DFIRMs **(Figures 7,7A, 7B and 7C)**. There were no channel migration studies available to include in the flood hazard analysis area. The results of the vulnerability analysis are presented in **Table 4.5-4**.

Table 4.5-4. Sanders County Vulnerability Analysis – Flooding

Category	Sanders Co. (balance)	Thompson Falls (city)	Plains (town)	Hot Springs (town)
Residential Property Exposure $	$20,430,781	$0	$2,639,855	$1,296,399
# Residences at Risk	133	0	37	15
Commercial/Ag & Industrial Property Exposure $	$9,195,818	$173,132	$0	$620,397
# Commercial/Ag & Industrial Properties at Risk	60	1	0	4
Critical Facilities Exposure Risk $	$6,048,113	$0	$262,989	$145,000
# Critical Facilities at Risk	3	0	1	1
Bridge Exposure $	$55,895,400	$0	$0	$0
# Bridges at Risk	36	0	0	0
Persons at Risk	183	0	83	31
Persons Under 18 at Risk	62	0	28	10
Persons Over 65 at Risk	98	0	44	16

The GIS analysis indicates that about 31,614 acres in Sanders County (1.8 percent) are located within the flood hazard area including 185 residences, 65 commercial/agricultural and industrial buildings, and 5 critical facilities. The *Flood* section in **Appendix C** presents supporting documentation from the risk assessment including the critical facilities and bridges located in the 100-year flood hazard area.

Based on the frequency of past events, the probability of flooding in Sanders County is rated as "likely", an event that occurs more than once a decade but not every year.

Future Development

Sanders County adopted floodplain development regulations that established a permitting system for development within the 100-year floodplains of local streams. The regulations provide guidance for development in flood-prone areas by restricting uses that are dangerous to public health, safety and property. Uses are delineated as to which uses are permitted, permitted conditionally or prohibited, as outlined in the current floodplain regulations.

Sanders County Subdivision Regulations indicate that land located in the floodway of a 100-year flood event may not be subdivided for building or residential purposes, or other uses that may increase or aggravate flood hazards. If any portion of a proposed subdivision is within 2,000 horizontal feet and 20 vertical feet of a live stream draining an area of 25 square miles or more, and no official floodway delineation or floodway studies of the stream have been made, the subdivider must furnish survey data to Montana DNRC. Survey data must comply with the Standards for Flood Hazard Evaluations, including the calculated 100-year frequency water surface elevations and/or 100-year floodplain boundaries. This detailed evaluation must be performed by a licensed professional engineer experienced in this field of work. After Montana DNRC has prepared a report delineating the floodway, the subdivider must submit it to the subdivision administrator along with the Environmental Assessment required for the preliminary plat.

Climate Change

Many scientists agree that climate change will increase heavy rainfall and storms across the U.S., which will result in elevated water levels that may lead to a higher frequency of flooding. The Montana Climate Assessment (Whitlock et.al, 2017) provides a well-referenced discussion on the effects of climate change on flooding, as summarized below.

Across Montana, precipitation is projected to increase in winter, spring, and fall. The largest increases are expected to occur during spring in the southern part of the state. Warming will continue to reduce mountain snowpack, and this could reduce flood risk related to rain-on-snow events by reducing the quantity of water available for release stored as snow. Yet warming is also likely to increase the amount of winter and spring precipitation that falls as rain (particularly in rain-snow transition zones), which will accelerate snowmelt and could increase flood risk, depending on antecedent snowpack, soil moisture, and other conditions. As such, rising temperatures alone will influence flood risk, regardless of trends in precipitation; yet the effects will likely be location- and event-specific and therefore, difficult to predict.

Future precipitation projections show a general increase in extreme events at a global scale and regional climate models also consistently predict increases in extreme precipitation in the northwestern United States. In Montana, the frequency of wet events (days with > 1 inch of rain) and variability in precipitation are both projected to increase slightly in western Montana by end-of-century.

There is considerable uncertainty surrounding future flood risk in response to climate change, and some research suggests that extreme precipitation events can actually intensify more quickly than what is projected by general circulation models. Additionally, flood risk depends on specific storm characteristics that are difficult to capture in most models. Moreover, the particular effects of

projected changes in temperature and precipitation on flood risk will depend on location, elevation, and antecedent weather conditions, as well as human practices (Whitlock et.al, 2017).

Population, property, and critical facility flood exposure may increase as a result of climate change. Runoff patterns may change resulting in flooding in areas where it has not previously occurred with an increased risk to facilities that have not historically flooded.

The significance of increased flooding is great. Besides impacting communities, destroying homes, and causing deaths, floods can cause drinking water to become contaminated, Floods can also cause hazards such as disease-carrying animals and spills of chemicals or other hazardous materials. Overall, if flooding is to increase from climate change it will also pose risks to people's health and to entire communities.

4.6 Terrorism, Violence, Civil Unrest & Cyber Security

CPRI SCORES:
TERRORISM, VIOLENCE, CIVIL UNREST = 2.45
CVYBER SECURITY = 2.15

Description and History

Terrorism is defined in the Code of Federal Regulations as "the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives". Terrorists look for visible targets where they can avoid detection before or after an attack such as international airports, large cities, major international events, resorts, and high-profile landmarks. Bombings involving detonated and undetonated explosive devices, tear gas, and pipe and fire bombs have been the most frequently-used terrorist method in the United States. Other possible methods include attacks on transportation routes, utilities, or other public services, or incidents involving chemical or biological agents.

Lone gunman shootings (active shooters) are another form of terrorism. In the U.S., lone gunman shootings have occurred at schools, movie theaters, and other locations. Most lone gunman shootings occur where a specific place was deliberately selected as the location for the attack and was not simply a random site of opportunity. These shootings have sparked a political debate over gun violence, whether firearms should be allowed in the classroom and whether there should be stricter gun control. There have been no lone gunman shootings in Sanders County.

Eco-terrorism is the use or threatened use of violence of a criminal nature against innocent victims or property by an environmentally-oriented, subnational group for environmental-political reasons, or aimed at an audience beyond the target, often of a symbolic nature.

Large gatherings in Montana bring increased risk of violence. Many communities host annual events which draw thousands of participants, many from out-of-state. Rainbow Family Gatherings, which have been held in Montana several times in the past 20 years, are another example of large gatherings which pose a risk of violence.

Violent protests and riots resulting from police brutality against African Americans gained widespread notoriety in the 2010s, and the tensions ignited after particular incidents such as the killings of Trayvon Martin (2012), Michael Brown, Jr (2014) and Freddie Gray (2015). The Black Lives Matter Movement, originating in the African-American community in 2013, campaigns against violence and systemic racism toward black people. The movement regularly protests police killings of black people and broader issues of racial profiling, police brutality, and racial inequality in the United States criminal justice system. Due to the demographics of Sanders County, racial violence is not a great risk.

Civil unrest typically occurs when large groups, organizations, or distraught individuals take action with potentially disastrous or disruptive results. Civil unrest can be the product of another event that creates panic in the community. In Sanders County, the potential exists for civil unrest to exceed the capabilities of the local government to handle.

According to the Southern Poverty Law Center (SPLC, 2018), an organization devoted to tracking hate groups in the U.S., the number of anti-government groups in Montana held steady while anti-Muslim activity surged. Of the 917 hate organizations identified nationally in the latest report, eight are in Montana, including three white nationalist groups, four anti-Muslim groups, and a neo-nazi

group. In Montana, hate groups include the American Freedom Party, Pioneer Little Europe, Radix Journal, and ACT for America. There were no hate groups identified in Sanders County; however, two white nationalist groups are headquartered in nearby Flathead County. In addition, several hate groups are headquartered in the Idaho Panhandle region which adjoins Sanders County on the west.

No disaster declarations have been issued to Sanders County for terrorism, violence, or civil unrest. However, several emergency declarations were issued in Montana to activate the National Guard to assist with these types of incidents (**Table 4.6-1**).

Table 4.6-1. Montana Terrorism, Violence and Civil Unrest Emergency Declarations

Declaration	Date	Magnitude	Comments
N/A	Jan-Feb 1979	Activation of National Guard for State Institutions strike	No casualties; $1,393,714 costs
State EO-03-91	April 1991	Activation of National Guard and Assistance Statewide for State Institutions Strike	No casualties
State EO-10-96	April 23,1996	Incident Response for Anniversary of Waco and Oklahoma City Incidents	No casualties; $4,368 costs
State EO-23-01	September 11, 2001	Emergency Declaration following the World Trade Center and Pentagon terrorist attacks	No casualties
State EO 26-01	September 28, 2001	National Guard activation to provide personnel for airport security	No casualties

Source: DES, 2018

Cyberterrorism is the use of information technology by terrorist groups and individuals to further their agenda. This can include use of information technology to organize and execute attacks against networks, computer systems and telecommunications infrastructures, or for exchanging information or making threats electronically. Examples are hacking into computer systems, introducing viruses to vulnerable networks, web site defacing, or terroristic threats made via electronic communication.

Public interest in cyberterrorism began in the late 1980s with the widespread use of the internet. As 2000 approached, the fear and uncertainty about the millennium bug heightened, as did the potential for attacks by cyber terrorists. The terrorist attacks on September 11, 2001 and the ensuing "War on Terror" led to further media coverage of the potential threats of cyberterrorism in the years following. The possibility of a large attack making use of computer networks to sabotage critical infrastructure with the aim of putting human lives in jeopardy or causing disruption on a national scale, either directly or by disruption of the national economy, has been a concern for the past decade.

Internet fraud is the use of internet services or software with internet access to defraud victims or to otherwise take advantage of them; for example, stealing personal information that leads to identity theft. A very common form of internet fraud is the distribution of rogue security software. The most widespread internet and email scam today is called phishing, where digital thieves lure you into divulging your password information through convincing emails and web pages. These phishing emails and web pages resemble legitimate credit authorities. They frighten or entice you into visiting a phony web page and entering your ID and password. Commonly, the guise is an urgent need to "confirm your identity". They will even offer you a story of how your account has been attacked by hackers to lure you into entering your confidential information. The email message will require you to click on a link. But instead of leading you to the real login site, the link will redirect you to a fake website where you may innocently enter your ID and password. This information is intercepted by the scammers, who later access your account and extort money.

Senior citizens are also vulnerable to health care scams. Scammers will call as healthcare or Medicare representatives to gain access to their personal or contact information. They will use their contact information to call seniors back at a later date and say they spoke with their daughter, son or other relative and that it's OK to give them Social Security numbers, driver's license numbers or other personal information.

Con artists are also creating devious schemes to prey on retired persons and their accumulated wealth. Senior citizens are receiving phone calls from scammers who purport to be IRS agents. They claim to be calling about unpaid back taxes and proceed to threaten the senior citizen with arrest, lawsuits, suspension of their driver's license and more. Tax-refund fraud hit $21 billion in 2016. All it takes to file a false return is a name, date of birth, and social security number; the type of information that is commonly taken when health care insurers are hacked.

Vulnerability and Area of Impact

The origins and targets for terrorism and civil unrest are difficult to predict. Individuals or groups that feel oppressed on any issue can resort to violent acts to inflict harm and damage in an attempt to gain publicity or affect policy. Montana has traditionally attracted activist/extremist individuals and groups because of its low population and large geographic area. Groups active in Montana vary from white supremacists to single issue groups, such as environmental extremists. According to the Southern Poverty Law Center, no hate groups are currently headquartered in Sanders County although several exist in neighboring Flathead County and the adjoining Idaho Panhandle.

The effects of civil unrest and violence are typically felt by the population. The greatest risk is to human lives during times of unrest. Looting is commonly found in association with these types of events. Therefore, this hazard places both the population and property at risk. Urban areas and places of public gathering are generally areas of greatest risk.

The vulnerability of local communities to a breach in cyber security is real and presents a serious business risk to government operations. Attacks have the potential to cripple vital government services and damage public infrastructure. All government agencies hold valuable or sensitive material, including citizen records, financial information and procurement data. Therefore, everyone is a target. And in today's highly interconnected world, each agency—no matter how small—is a stepping stone to another. So even a seemingly minor breach can have wide-ranging implications. (Governing Institute, 2017).

Agencies also are under nearly constant assault. Hackers know that state and local governments often lag behind commercial entities in cybersecurity readiness. Consequently, the number of attackers probing municipal systems for vulnerabilities is exploding—everyone from small-time crooks equipped with black-market ransomware kits, to nation states and organized crime syndicates armed with sophisticated cyber weapons.

The threats are wide-spread. Small towns and school districts are hit with ransomware that shuts down computer systems until they make a payment. Thieves steal citizen identities and financial information from state agency databases. Water authorities endure surgical strikes that use specialized computer code to destroy water pumps.

Healthcare also faces varied cybersecurity threats that continue to evolve and become more intricate. This includes but is not limited to insider threats, poorly secured web portals, improper data handling, and under-regulated medical data mining. Medical data is more valuable to attackers than financial data, and it can easily be stolen from vulnerable web portals.

It should be noted, that Sanders County may feel secondary economic impacts from terrorism, civil unrest, or cyber security breaches that affect Montana's regional centers, particularly Kalispell, Missoula, or Helena. Sanders County relies on these regional centers for services that ensure continuity of operations locally.

Probability and Magnitude

The probability of terrorism, violence, a cyber breach, or civil unrest in Sanders County directly is difficult to determine. The county is not considered a specific terrorist target nor is it an area of high risk for civil unrest. A large-scale attack cannot be ruled out, and therefore, a small probability exists. Of greater probability is a national terrorist incident or cyberattack that has an indirect effect on Sanders County through its economy.

The effects of terrorism can vary significantly from loss of life and injuries to property damage and disruptions in services such as electricity, water supply, public transportation, and communications. Cyber terrorism could involve destroying or remotely disrupting government computer networks, critical civilian systems such as financial networks or mass media or using computer networks to take over machines that control traffic lights, power plants or dams. If cyber-terrorists managed to disrupt financial markets or media broadcasts, an attack could undermine confidence and cause panic. Attacks could also involve remotely hijacking control systems, with potentially dire consequences, such as breaching dams, colliding airplanes, or shutting down the power grid.

Terrorism and cyberattacks are considered emerging hazards with little to no history in the region but incidents occurring with more frequency across the globe. As such, the probability of a future terrorism/cyber incident in Sanders County was rated by the Planning Team as "possible".

Future Development

Future development should have little to no impact on the terrorism or violence threat. Given the goals of eco-terrorists; however, future development could serve as the basis for an event over controversial development.

Climate Change

Many academics and national security experts agree that climate change contributes to an uncertain world where terrorism can thrive. Climate change not only threatens the environment, it can lead to greater instability and fuel global conflict and terrorism. Some of the least stable states in the world will face changing weather patterns that reduce arable land and fresh-water supplies, in turn driving mass-migration, provoking resource conflicts, and fostering global health threats.

Both cyber threats and climate change are security risks that can affect the safety and security of our most basic resources, such as water, energy and infrastructure, mostly due to a common factor: interconnectedness. As human beings and as nations, we are and always will be directly connected to our environment, as it provides us with the resources necessary for both survival and prosperity.

We have also become intimately connected and dependent on our computer-based technologies, with cyberspace and the internet being a primary conduit. And just as climate change can affect our access to (and supply of) water and energy, a cyber-attack on computers and industrial equipment that run water treatment facilities and power plants can have significant negative consequences (Allen, 2014).

4.7 Communicable Disease

CPRI SCORE = 2.6

Description and History

Infectious diseases, sometimes called communicable diseases, are illnesses caused by organisms such as bacteria, viruses, fungi and parasites. Sometimes the illness is not due to the organism itself, but rather a toxin that the organism produces after it has been introduced into a human host. Communicable disease may be transmitted (spread) either by one infected person to another, from an animal to a human, from an animal to an animal, or from some inanimate object (doorknobs, table tops, etc.) to an individual. A pandemic is a global disease outbreak. Human diseases, particularly epidemics, are possible throughout the nation and Sanders County is not immune to this hazard. In addition, livestock and animal disease could have a devastating effect on the economy and food supply in Sanders County and beyond. Highly contagious diseases are the most threatening to both populations.

Communicable disease or biological agents could be devastating to the population or economy of Sanders County. Human diseases when on an epidemic scale, can lead to high infection rates in the population causing isolation, quarantines and potential mass fatalities. Diseases that have been eliminated from the United States' population, such as smallpox, could be used in bioterrorism.

The following list gives examples of biological agents or diseases that could occur naturally or be used by terrorists as identified by the Centers for Disease Control and Prevention (2018).

Category A

Definition - The United States public health system and primary healthcare providers must be prepared to address various biological agents, including pathogens that are rarely seen in the United States. High-priority agents include organisms that pose a risk to national security because they:

- Can be easily disseminated or transmitted from person to person;
- Result in high mortality rates and have the potential for major public health impact;
- Might cause public panic and social disruption; and
- Require special action for public health preparedness.

Agents/Diseases:

- Anthrax (Bacillus anthracis)
- Botulism (Clostridium botulinum toxin)
- Plague (Yersinia pestis)
- Smallpox (variola major)
- Tularemia (Francisella tularensis)
- Viral hemorrhagic fevers (filoviruses [e.g., Ebola, Marburg] and arenaviruses [e.g., Lassa, Machupo])

Category B

Definition - Second highest priority agents include those that:

- Are moderately easy to disseminate;
- Result in moderate morbidity rates and low mortality rates; and

- Require specific enhancements of CDC's diagnostic capacity and enhanced disease surveillance.

Agents/Diseases:

- Brucellosis (Brucella species)
- Epsilon toxin of Clostridium perfringens
- Food safety threats (e.g., Salmonella species, Escherichia coli O157:H7, Shigella)
- Glanders (Burkholderia mallei)
- Melioidosis (Burkholderia pseudomallei)
- Psittacosis (Chlamydia psittaci)
- Q fever (Coxiella burnetii)
- Ricin toxin from Ricinus communis (castor beans)
- Staphylococcal enterotoxin B
- Typhus fever (Rickettsia prowazekii)
- Viral encephalitis (alphaviruses [e.g., Venezuelan equine encephalitis, eastern equine encephalitis, western equine encephalitis])
- Water safety threats (e.g., Vibrio cholerae, Cryptosporidium parvum)

Category C

Definition - Third highest priority agents include emerging pathogens that could be engineered for mass dissemination in the future because of:

- Availability;
- Ease of production and dissemination; and
- Potential for high morbidity and mortality rates and major health impact.

Agents:

- Emerging infectious diseases such as Nipah virus and hantavirus

These diseases/bioterrorism agents can infect populations rapidly, particularly through groups of people in close proximity such as schools, assisted living facilities, and workplaces.

Historically, the Spanish influenza outbreak after World War I in 1918-1919 caused 9.9 deaths per 1,000 people in the State of Montana (Brainerd and Siegler, 2002). Historical records from newspapers show that the influenza outbreak was so bad in 1918 that residents were quarantined from November 30 to December 17 after 18 people died and 53 new cases were discovered.

Influenza is a highly contagious viral infection of the nose, throat, and lungs that occurs most often in the late fall, winter, and early spring. It is a serious infection that affects between 5-20 percent of the United States population annually. Each year, more than 200,000 individuals are hospitalized and 3,000-49,000 deaths occur from influenza-related complications (IDSA, 2016). The Montana Dept. of Public Health and Human Services (DPHHS), maintains statistics of influenza cases in Montana counties. Recent data for Sanders County is summarized below.

- 2013-2014 season: 8 influenza cases in Sanders County with 8 fatalities across the State.
- 2014-2015 season: 22 influenza cases in Sanders County with 24 fatalities across the State.
- 2015-2016 season: 28 influenza cases in Sanders County with 33 fatalities across the State.

- 2016-2017 season: 59 influenza cases in Sanders County with 56 fatalities across the State.
- 2017-2018 season: 88 influenza cases in Sanders County with 79 fatalities across the State.

Norovirus is the leading cause of illness and outbreaks from contaminated food in the United States. Most outbreaks happen when infected people spread the virus to others. Health care facilities, including nursing homes and hospitals, are the most commonly reported settings for norovirus outbreaks.

Montana DPHHS manages a database of reportable communicable disease occurrences. A summary for Sanders County for the years 2007 to 2016 is presented in **Table 4.7-1.**

Table 4.7-1. Sanders County Communicable Disease Summary; 2007 - 2016

Disease	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Vaccine Preventable Diseases										
Hepatitis A, acute	-	-	-	1	-	-	2	-	-	-
Hepatitis C, chronic	-	-	-	-	-	13	6	34	18	26
Meningococcal	-	1	-	-	-	-	-	-	-	-
Pertussis	-	-	-	-	-	-	1	33	-	-
Strep Pneumonia	-	1	-	-	-	-	1	-	1	2
Varicella	-	8	8	9	7	3	-	2	2	-
Enteric Diseases										
Campylobacteriosis	-	-	3	1	3	4	4	2	2	4
Cryptosporidiosis	-	-	1	2	1	-	-	-	-	-
Giardia	5	1	1	-	2	-	1	3	3	-
Salmonella	1	2	-	1	1	-	-	-	2	3
Shiga-toxin *E. coli*	-	-	-	-	-	-	-	-	3	-
Other Communicable Diseases										
Rabies	-	-	-	-	-	-	1	-	-	-
STDs	15	13	12	18	13	16	14	29	19	13
Tick Fever, Lyme	-	-	2	-	-	-	-	-	-	-
West Nile Virus	-	-	3	-	-	-	-	-	-	-

Source: Montana DPHHS Communicable Disease Summaries, 2007 – 2016; Notes: STD = Sexually Transmitted Disease

Vulnerability and Area of Impact

Diseases threaten the population, plants, and animals of Sanders County as opposed to structures. The entire population is at risk for contracting disease. The more urban nature of Thompson Falls makes it more vulnerable to rapidly spreading and highly contagious diseases compared to other more rural parts of the county. In addition, tourist visits in the county could introduce a disease to the local population. The number of fatalities in the county would depend on the mortality (disease/agent attack) rate and the percentage of the population affected. The ability to control the spread of disease will be dependent on the contagiousness of the disease and movement of the population. Given the uncertain nature of diseases, Sanders County is assumed to have the same infectious disease risk county-wide.

Probability and Magnitude

Individual infectious diseases will likely be reported on an annual basis giving this hazard a probability rating of "highly likely". The MHMP Planning Team rated the probability as "likely", an event that occurs more than once per decade but not every year.

The magnitude of an infectious disease outbreak varies from common viral outbreaks to widespread bacterial infection. During the 1918 influenza pandemic, infection rates approached 28 percent in the United States (Billings, 1997). Other pandemics produced infection rates as high as 35 percent of the total population (World Health Organization, 2009). Such a pandemic affecting Sanders County would represent a severe magnitude event. Almost any communicable disease that enters the regional population could overwhelm local health resources as would any rapidly spreading bioterrorism event for which there is no available vaccine or containment capability.

Montana's local and state public health officials monitored developments regarding Zika virus closely. They determined that the impact of Zika in Montana would likely be confined to individuals returning from or planning travel to Zika-affected areas. Montana's mosquitoes are not expected to be able to transmit the virus.

Future Development

There are no land use regulations for future development that could impact the communicable disease hazard. New residents and population add to the number of people threatened in the county, but the location of such population increases would not increase their vulnerability to the hazard.

Climate Change

The effects of climate change on the disease hazard is mainly to the population. Outbreaks of insect- and water-borne infection associated with higher temperatures could increase population exposure; especially vulnerable would be the young and elderly. With higher temperatures, harmful algal blooms are more apt to form on lakes which could expose swimmers to cyanobacteria known to cause Alzheimer's, ALS, and other neurological diseases. Property and critical facilities are not expected to have an increase in disease exposure or vulnerability due to the effects of climate change.

Although some evidence indicates that warming may be causing infectious disease to spread, predicting how climate change will ultimately influence the incidence of diseases transmitted by insects remains challenging. More predictable as climate change unfolds is the spread of waterborne infections. These infections most often cause diarrheal illness and flourish in the wake of heavy rainfalls as runoff from land enters into and may contaminate water supplies. Many pathogens that cause diarrheal disease reproduce more quickly in warmer conditions as well (Harvard School of Public Health, 2016).

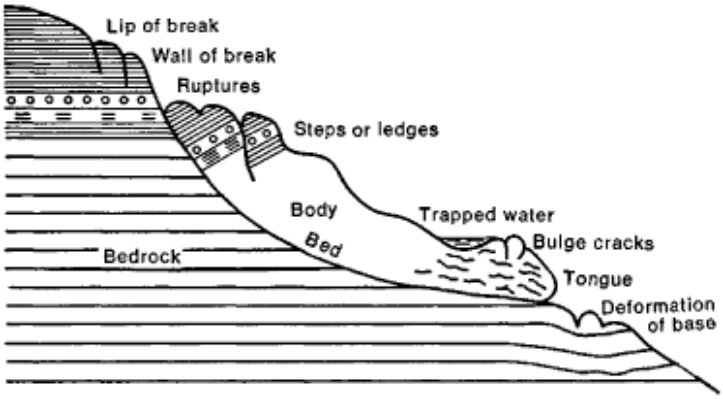
Awareness has been growing in recent years about zoonotic diseases— that is, diseases that are transmissible between animals and humans, such as Lyme disease and West Nile virus. The rise of such diseases results from closer relationships among wildlife, domestic animals, and people, allowing more contact with diseased animals, organisms that carry and transmit a disease from one animal to another (vectors), and people. Disease vectors include insects, such as mosquitoes, and arachnids, such as ticks. Thus, it is impossible to separate the effects of global warming on wildlife from its effects on the health of domestic animals or people (USGS, 2012).

4.8 Landslide

CPRI SCORE = 2.3

Description and History

A landslide is the movement of a soil and/or rock mass down a slope. Any area composed of very weak or fractured materials resting on a steep slope can and likely will experience landslides. Landslides or debris flows, are often difficult to distinguish from flash floods and possess similar destructive potential and rapid onset. Debris flows generally occur during periods of intense rainfall or rapid snowmelt. They usually start on steep hillsides as shallow slides that liquefy and accelerate. The consistency of debris flow range from watery mud to thick, rocky mud that can carry large items such as boulders, trees and cars. When the flow reaches flatter ground, debris can spread over a broad area, sometimes accumulating in thick deposits. Any given mass movement is triggered by a single event. The two most common triggers are earthquakes and heavy rainfall.



Slope failure occurs when the gravitational force of slope materials exceed resisting forces due to strength, friction, and cohesion of the supporting materials. Slope properties, such as steepness, layering, fracturing of materials, or lack of vegetation, can make them inherently susceptible to failure. Factors such as moisture, overloading, and undercutting, can make matters worse. These factors can occur naturally or induced by development activity. Slope failures are distinguished by five types: falls or free drops from steep cliffs; slides or movement of unconsolidated materials along slip surfaces of shear failure; slumps or movements of consolidated materials along the surface of shear failures; flows; and the slow or rapid fluid-like movement of soils and other unconsolidated materials. Very slow down-slope flow of soil is referred to as creep. The average flow rate of materials can range from a fraction of an inch to 4 to 5 inches a week. Factors that influence creep include growing vegetation, freezing and thawing, and burrowing animals. Lateral spreads may occur on flat or gently sloping land due to liquefaction of underlying materials.

There is an increased risk of debris flows during heavy rains after wildfire because the burned ground is unable to absorb the falling rain, producing runoff conditions much like a parking lot. Because of this, even modest rainstorms over a burned area can result in flash flooding downstream that transport surface debris such as down trees, boulders, and gravel.

Vulnerability and Area of Impact

Landslides appear to have a stronger association with faulting than with any specific geologic unit (MBMG, 2002); however, some slides are most common where the underlying bedrock is sedimentary or volcanic. Volcanic-derived soils contain significant amounts of clay that can be susceptible to failure when wet or disturbed. Small slides and slumps can also occur along the steeper slopes of gullies and drainages. Steep slopes may be most vulnerable to rock falls. Debris flows can occur, especially in areas which have recently burned.

The MHMP Planning Team indicated several areas along the Highway 200 corridor in Sanders County are vulnerable to landslides, sloughing, or rock slides including the area west of Dixon by the sewage lagoon, the Fatman area, and the area west of Heron. Other slide-prone areas include River Road east of Plains, and the Clear Creek area. These areas are shown on **Figure 8**. Also shown on this map are areas of private land with slopes greater than 15 percent, as these areas are restricted from development by the Sanders County Subdivision Regulations.

The National Weather Service's database of recently burned areas that could generate debris flows indicated that the burn scar from the 2016 Copper King fire could generate debris flows that could impact several Sanders County residences (**Figure 8**).

Probability and Magnitude

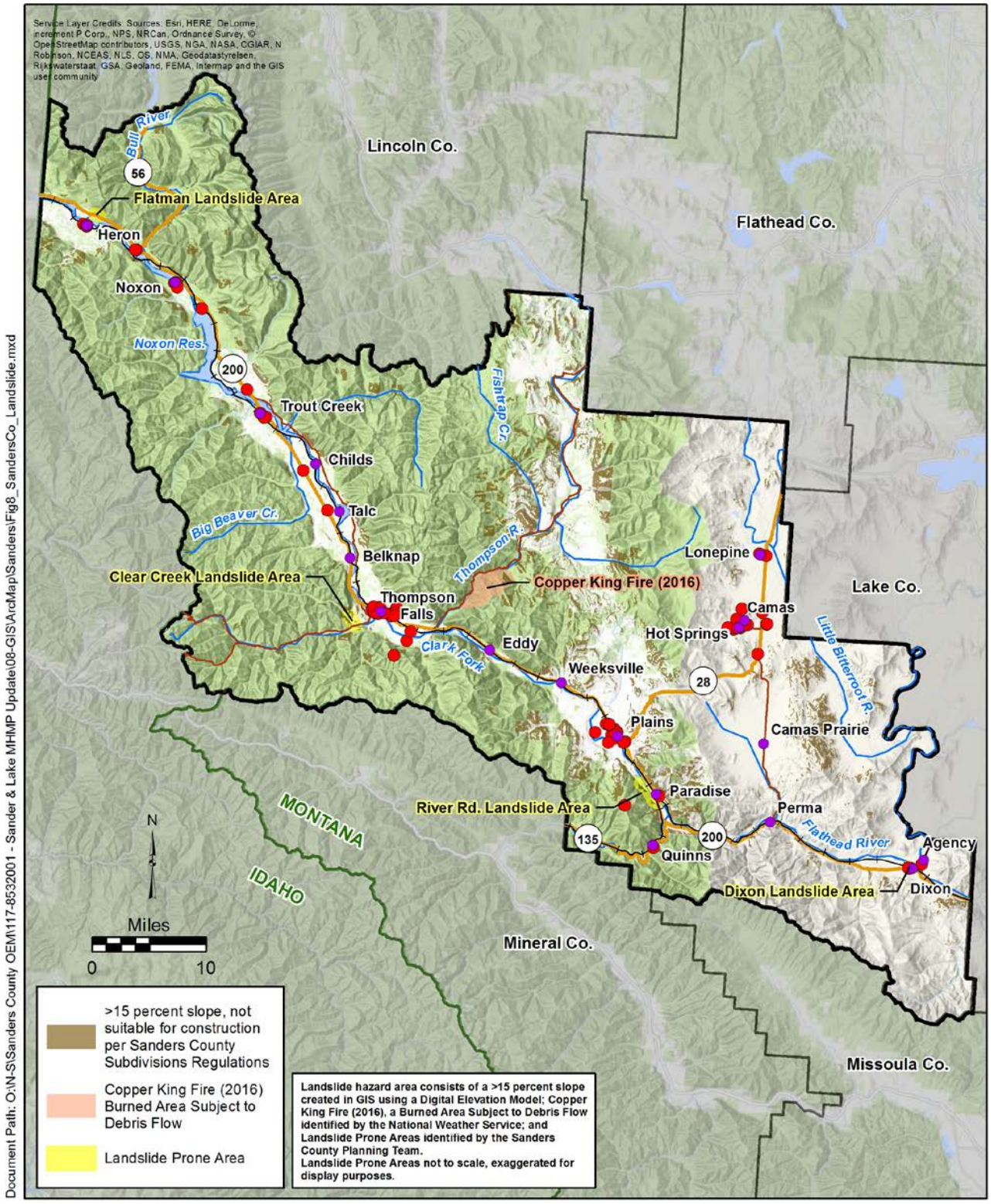
The landslide/rock fall hazard impact area used for the MHMP analysis consisted of the areas identified by the Planning Team as vulnerable to the landslide hazard, the burn scar of the 2016 Copper King wildfire, and private land with slopes over 15 percent grade (**Figure 8).** The landslide hazard area was intersected with the critical facility and general building stock database to determine exposure. Population exposure was calculated using U.S. Census county estimates. **Table 4.8-1** presents the results of the landslide vulnerability analysis.

Table 4.8-1. Sanders County Vulnerability Analysis; Landslide

Category	Sanders Co. (balance)	Thompson Falls (City)	Plains (Town)	Hot Springs (Town)
Residential Property Exposure $	$9,554,664	$0	$0	$0
# Residences at Risk	67	0	0	0
Commercial, Industrial & Agricultural Property Exposure $	$14,139,702	$0	$0	$0
# Commercial, Industrial & Agricultural Properties at Risk	72	0	0	0
Critical Facilities Exposure Risk $	$0	$0	$0	$0
# Critical Facilities at Risk	0	0	0	0
Bridge Exposure $	$620,000	$0	$0	$0
# Bridges at Risk	2	0	0	0
Persons at Risk	79	0	0	0
Persons Under 18 at Risk	27	0	0	0
Persons Over 65 at Risk	42	0	0	0

The GIS analysis indicates that there are almost 90,127 acres (5.1 percent) are prone to landslides in Sanders County including 67 residences, 72 commercial, industrial, and/or agricultural buildings, and 0 critical facilities. The *Landslide Section* in **Appendix B-4** presents supporting documentation from the vulnerability analysis.

Based on the frequency of landslides in Sanders County, the MHMP Planning Team rated the probability for a more significant landslide in the future as "possible", an event that occurs more than once per century but not every decade.



Legend

- Town
- Critical Facility
- Railroad
- MT Highway
- Secondary Road
- River
- Lake/Reservoir
- County Boundary

Date: 2/11/2019

Figure 8

Landslide Hazard Area
Sanders County, Montana
Multi-Hazard Mitigation Plan

Future Development

It is the responsibility of those who wish to develop their property to assess the degree of hazard in their selection of development sites. Although the physical cause of many landslides and rockfalls cannot be removed, geologic investigations, good engineering practices, and effective enforcement of land-use management standards can reduce landslide hazards.

The Sanders County Subdivision Regulations state that the decision on whether to conditionally approve or deny a proposed subdivision is based on an evaluation of suitability for the proposed land uses including any areas with slopes in excess of 15 percent grade, unstable slopes, and expansive soils. These requirements are also present in the Town of Plains subdivision regulations.

Climate Change

Landslides represent a major threat to human life, constructed facilities and infrastructure in most mountainous regions of the world. Considering future climate scenarios and modified precipitation patterns, the landslide activity will most probably change too. More precipitation now falls as rain rather than snow in northern regions and, as a consequence, more landslides are expected to occur. It is expected that shallow slips and debris flows will take place more frequently as a consequence of more extreme weather events. (https://globalwarmingisreal.com/).

4.9 Dam Failure

CPRI SCORE: 2.55

Description and History

Dams have been placed around Montana for many reasons including recreation, flood control, irrigation, water supply, hydroelectricity, and mining. Dams are built and owned by a variety of entities such as private individuals, utilities, and the government. Dams come in all shapes and sizes from small earthen dams to large concrete structures. The structural integrity of a dam depends on its design, maintenance, and weather/drainage situation. Problems arise when a dam fails, and people and/or property lie in its inundation area. Dams can fail for a variety of reasons including seismic activity, poor maintenance, overwhelming weather and flow conditions, or by an intentional act. Dam failure can be compared to riverine or flash flooding in the area downstream from the dam, and sometimes for long distances from the dam, depending on the amount of water retained and the drainage area. Other dams may be located in areas that result in little if any damages during a failure.

Aerial view of the Noxon Rapids reservoir and dam.

The U.S. Army Corps of Engineers, National Inventory of Dams website keeps a record of dams across the country. Hazard ratings are given to those dams for emergency management planning purposes. These ratings, high, significant, and low, are based on the potential for loss of life and property damage from the failure of the dam, not the condition or probability of the dam failing, as described in **Table 4.9-1.**

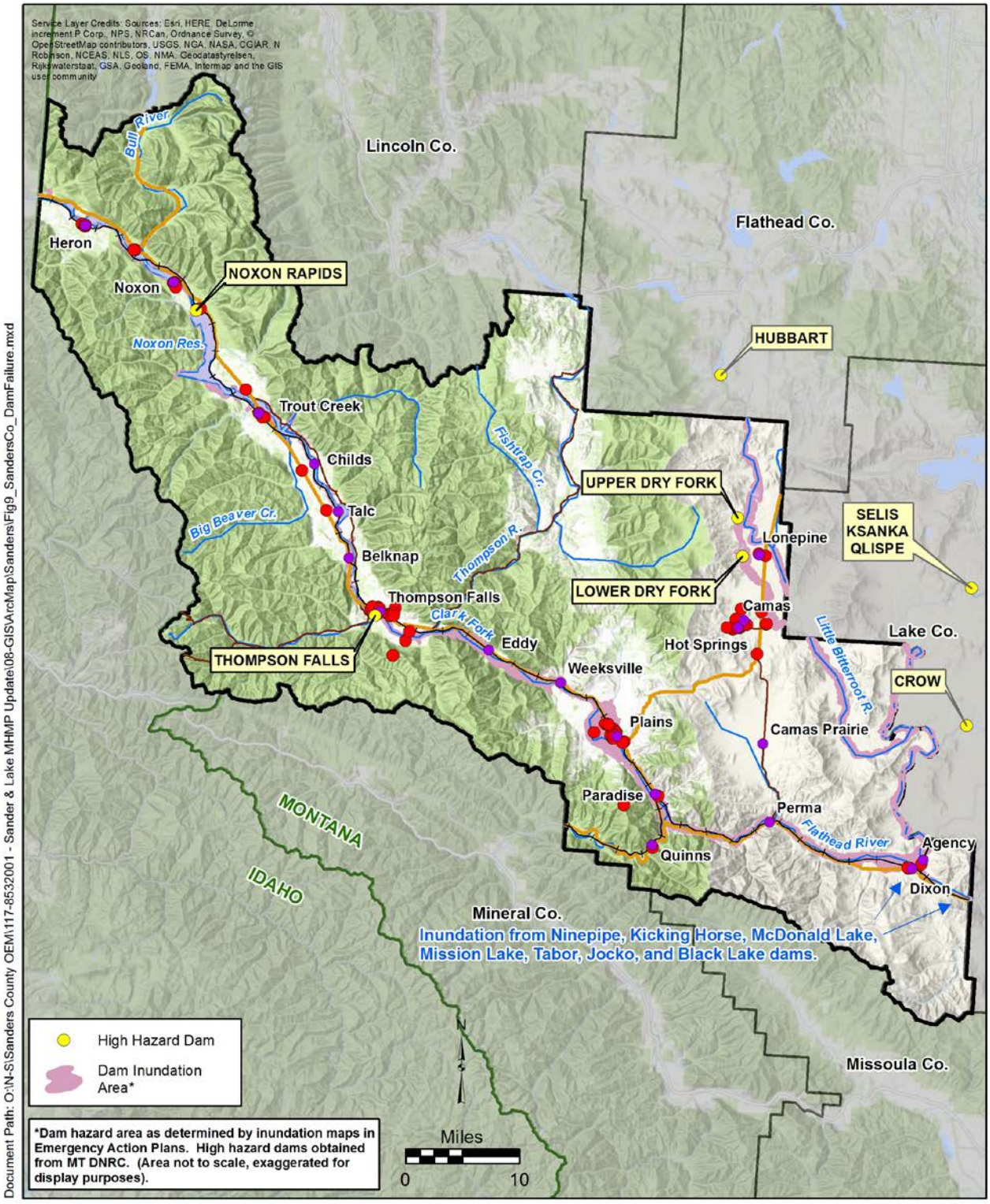
Table 4.9-1. Hazard Ratings for Dams

Rating	Description
Low Hazard Potential	Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.
Significant Hazard Potential	Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.
High Hazard Potential	Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

Source: FEMA

Sanders County has three high hazard dams and several significant or low hazard dams. There are several dams in adjoining Flathead and Lake Counties with the potential to impact human live in Sanders County if a failure were to occur.

Table 4.9-2 presents details on the Sanders County high hazard dams and **Figures 9, 9A, 9B and 9C** shows their location and/or inundation areas for the county, Thompson Falls, Plains, and Noxon, respectively. Sanders County OEM has Emergency Action Plans (EAPs) for the high hazard dams in the county. There is no record of failure of a high hazard dam in Sanders County.



Date: 2/4/2019

Legend

- Town
- Critical Facility
- Railroad
- MT Highway
- Secondary Road
- River
- Lake/Reservoir
- County Boundary

Figure 9

Dam Failure Hazard Area

Sanders County, Montana

Multi-Hazard Mitigation Plan

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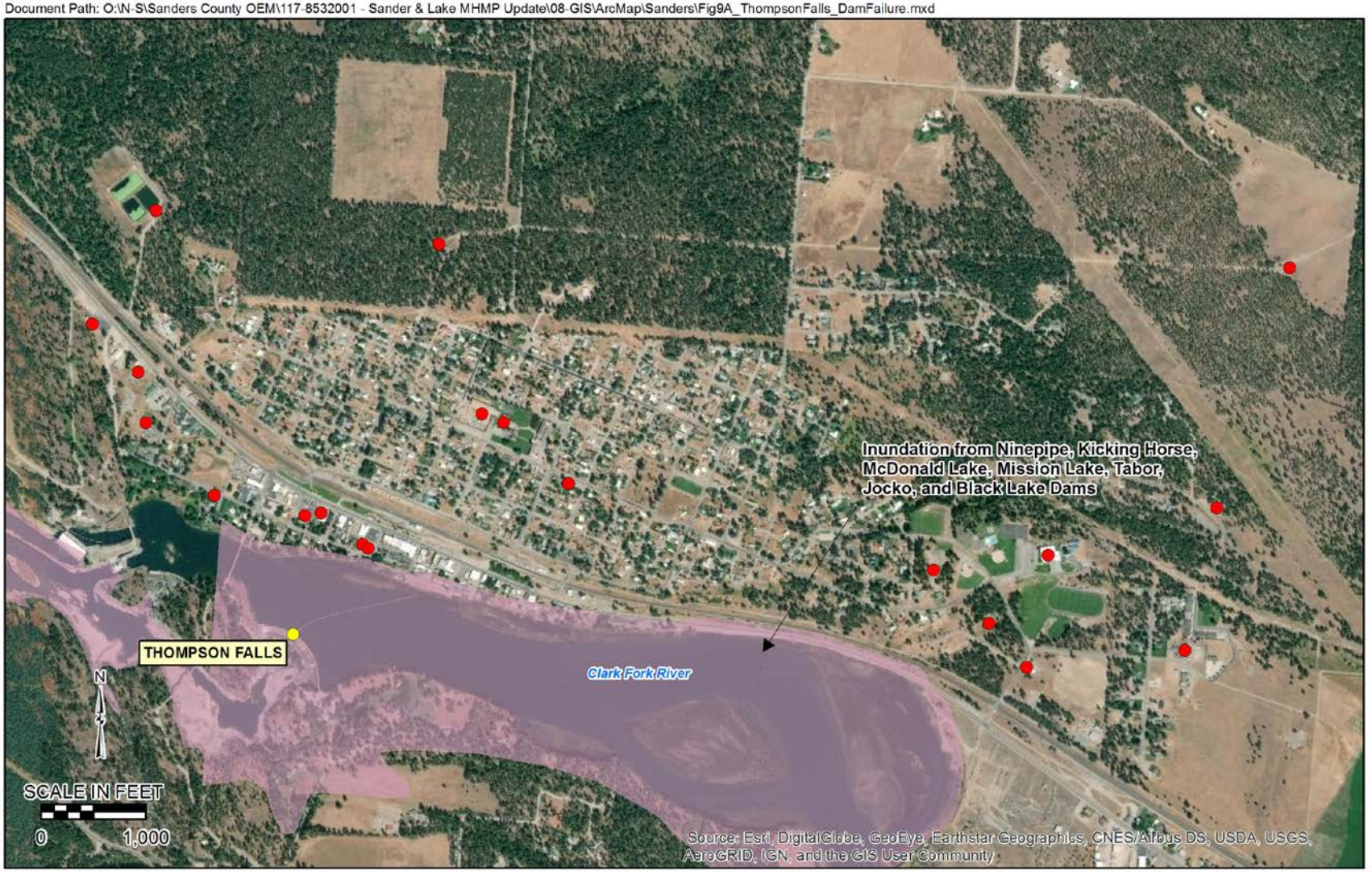

Date: 2/4/2019

Legend

- High Hazard Dam
- Critical Facility
- Dam Inundation Area

Figure 9A
Thompson Falls - Dam Failure Hazard Area
Sanders County, Montana
Multi-Hazard Mitigation Plan

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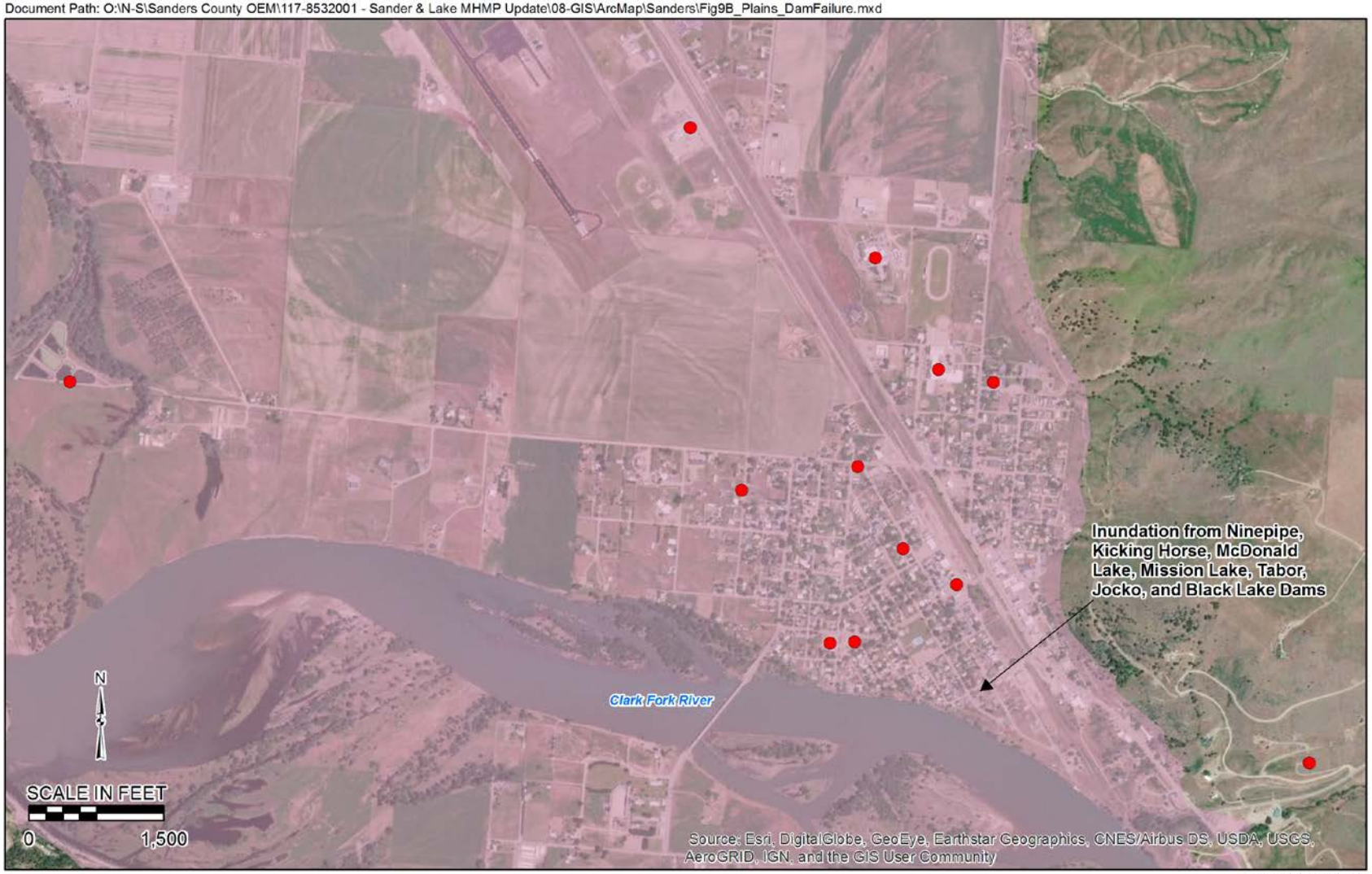

Date: 2/4/2019

Legend

- Critical Facility
- Dam Inundation Area

Figure 9B
Plains - Dam Failure Hazard Area
Sanders County, Montana
Multi-Hazard Mitigation Plan

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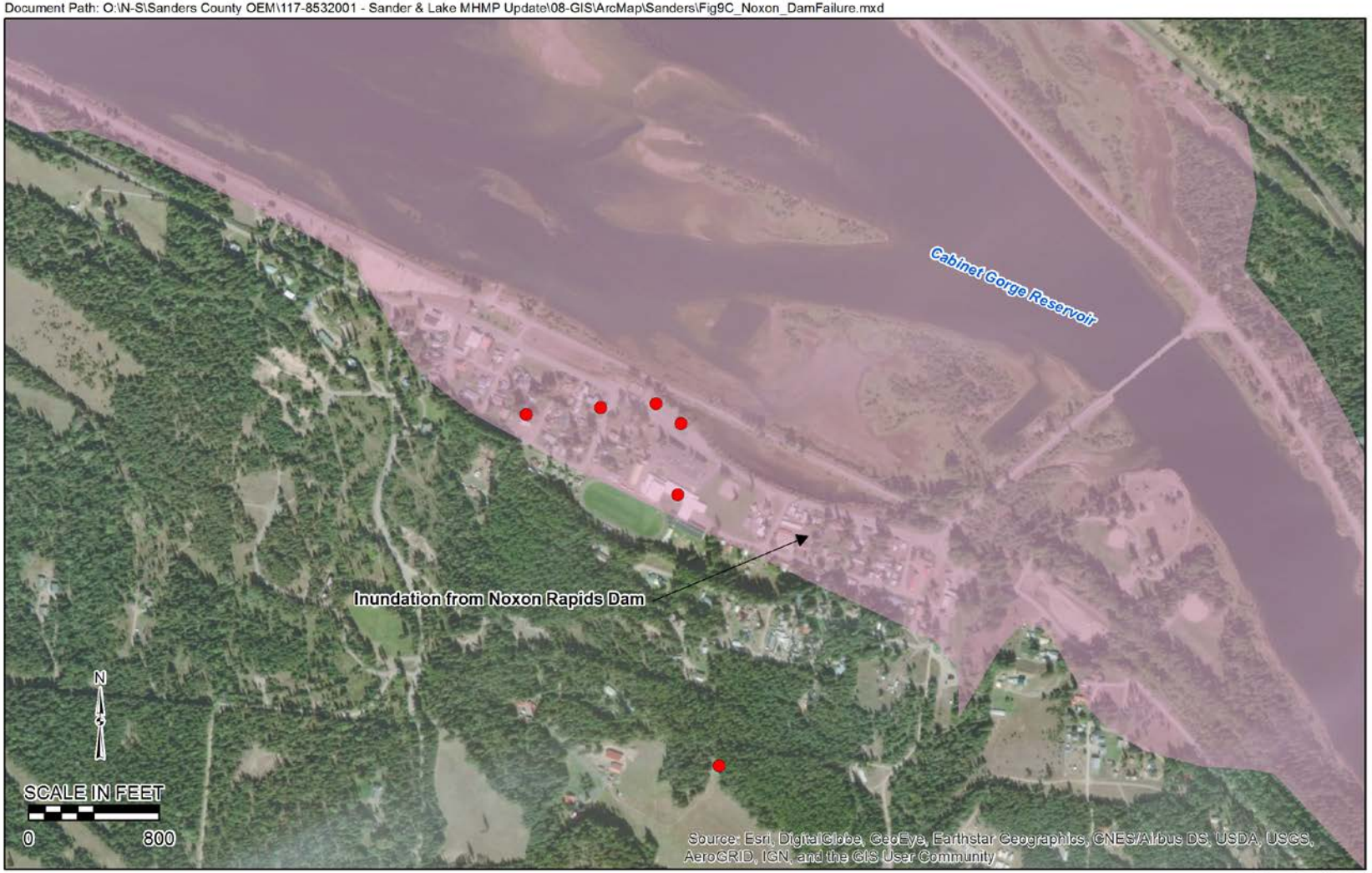


Date: 2/4/2019

Legend

- Critical Facility
- Dam Inundation Area

Figure 9C
Noxon - Dam Failure Hazard Area
Sanders County, Montana
Multi-Hazard Mitigation Plan

Table 4.9-2. High Hazard Dams in or Potentially Impacting Sanders County

Dam Name	Drainage	Height (feet)	Maximum Storage (acre-ft)	Drainage Area (sq. mi.)	Year Completed	Purpose	Owner
Noxon Rapids	Clark Fork River	179	4,000,000	21,880	1960	Hydroelectric	Avista Corp.
Lower Dry Fork	Dry Fork Creek	26	3,856	4,270	1921	Irrigation	BIA
Upper Dry Fork	Camas Canal	29	2,814	2,813	1940	Irrigation	BIA
Séliš Ksanka Qíispé (Kerr Dam, Lake Co.)	Flathead River	186	1,960,000	7,096	1939	Hydroelectric	CSKT
Hungry Horse (Flathead Co.)	So. Fork Flathead River	524	3,588,000	1,640	1953	Hydroelectric	USBR
Hubbart (Flathead Co.)	Little Bitterroot River	87	15,840	117	1923	Irrigation	CSKT

Notes: BIA = Bureau of Indian Affairs; USBR = U.S. Bureau of Reclamation; CSKT = Confederated Salish and Kootenai Tribes.
Source: DES, 2018; DNRC, 2018.

The Noxon Rapids dam is ranked as the 10th highest high hazard dam in Montana and has the second most acre feet of storage (DES, 2018). An emergency siren exists in the community of Noxon to warn of a pending dam failure.

Vulnerability and Area of Impact

Dams with the highest risk to life and property were they to breach are rated as high hazard dams. Those areas directly downstream from high hazard dams would be the areas most at risk for loss of life and structural damage.

MHMP Planning Team members stated that both the Thompson Falls and Noxon Rapids dams have issues with woody debris flowing downstream during floods and/or associated with burn scar debris flows and potentially impacting the dam infrastructure. Both dams are equipped with cranes that are used to remove debris as needed.

Figures 9, 9A, 9B and 9C present the inundation area associated with the high hazard dams in Sanders County, Thompson Falls, Plains, and Noxon, respectively. The community of Dixon would also be inundated by Séliš Ksanka Qíispé dam. The dam failure impact map was developed by compiling electronic and digitized hard copy inundation maps included in EAPs, as available. Sanders County OEM participates in dam failure exercises with dam owner(s) and other emergency response personnel annually.

Probability and Magnitude

The dam inundation hazard area was intersected with the general building stock and critical facility datasets using GIS (**Tables 4.9-3**). Vulnerable population was calculated based on U.S. Census county estimates.

Table 4.9-3. Sanders County Vulnerability Analysis – Dam Failure

Category	Sanders Co. (balance)	Thompson Falls (city)	Plains (town)	Hot Springs (town)
Residential Property Exposure $	$124,786,464	$2,504,397	$42,566,288	$0
# Residences at Risk	988	17	533	0
Commercial/Ag & Industrial Property Exposure $	$38,984,800	$664,266	$17,084,101	$0
# Commercial/Ag & Industrial Properties at Risk	208	5	83	0
Critical Facilities Exposure Risk $	$26,332,155	$0	$33,254,547	$0
# Critical Facilities at Risk	20	0	4	0
Bridge Exposure $	$57,355,420	$0	$0	$0
# Bridges at Risk	32	0	0	0
Persons at Risk	1,287	45	1,045	0
Persons Under 18 at Risk	433	16	352	0
Persons Over 65 at Risk	683	25	639	0

The GIS analysis indicates that 61,456 acres (3.5 percent) are located in the dam inundation hazard area including 1,538 residences, 296 commercial/agricultural and industrial buildings, and 24 critical facilities. The *Dam Failure* section in **Appendix C** presents supporting documentation from the risk assessment including the critical facilities and bridges located in the dam inundation hazard area.

A dam breach could cause significant losses and casualties. Circumstances causing a breach could be structural failure, earthquakes, terrorism, or even a major landslide. Design standards for dams and spillways typically exceed 500-year return intervals for flooding and earthquakes; therefore, the likelihood for a breach to occur are very low. As such, the probability of dam failure is rated as "unlikely"; an event that occurs less than once per 100 years.

Future Development

Sanders Clark County subdivision regulations do not currently prevent new construction in dam inundation areas. There are no disclosure requirements that advise developers what property is at risk from dam failure inundation.

Climate Change

Small changes in rainfall, runoff, and snowpack conditions may have significant impacts for water resource systems, including dams. Dams are designed partly based on assumptions about a river's flow behavior, expressed as hydrographs. Changes in weather patterns can have significant effects on the hydrograph used for the design of a dam. If the hygrograph changes, it is conceivable that the dam can lose some or all of its designed margin of safety, also known as freeboard. If freeboard is reduced, dam operators may be forced to release increased volumes earlier in a storm cycle in order to maintain the required margins of safety. Such early releases of increased volumes can increase flood potential downstream.

Dams are constructed with safety features known as "spillways." Spillways are put in place on dams as a safety measure in the event of the reservoir filling too quickly. Spillway overflow events, often referred to as "design failures," result in increased discharges downstream and increased flooding potential. Although climate change will not increase the probability of catastrophic dam failure, it may increase the probability of design failures.

Population and property exposure to the dam failure hazard are not likely to change significantly as a result of climate change. The potential increase in probability of dam failure would not likely impact additional areas not already identified on inundation maps with the exception of spillway shadows which are not always captured on inundation maps. Dam owners and operators may need to alter maintenance and operations to account for changes in the hydrograph and increased sedimentation.

4.10 Risk Assessment Summary

This section summarizes the results of the individual risk assessments presented under the hazard profiles. Neither Sanders County nor the incorporated communities of Thompson Falls, Plains or Hot Springs have had repetitive flood losses or repetitive losses associated with other hazards.

Future Development and Composite Hazard Map

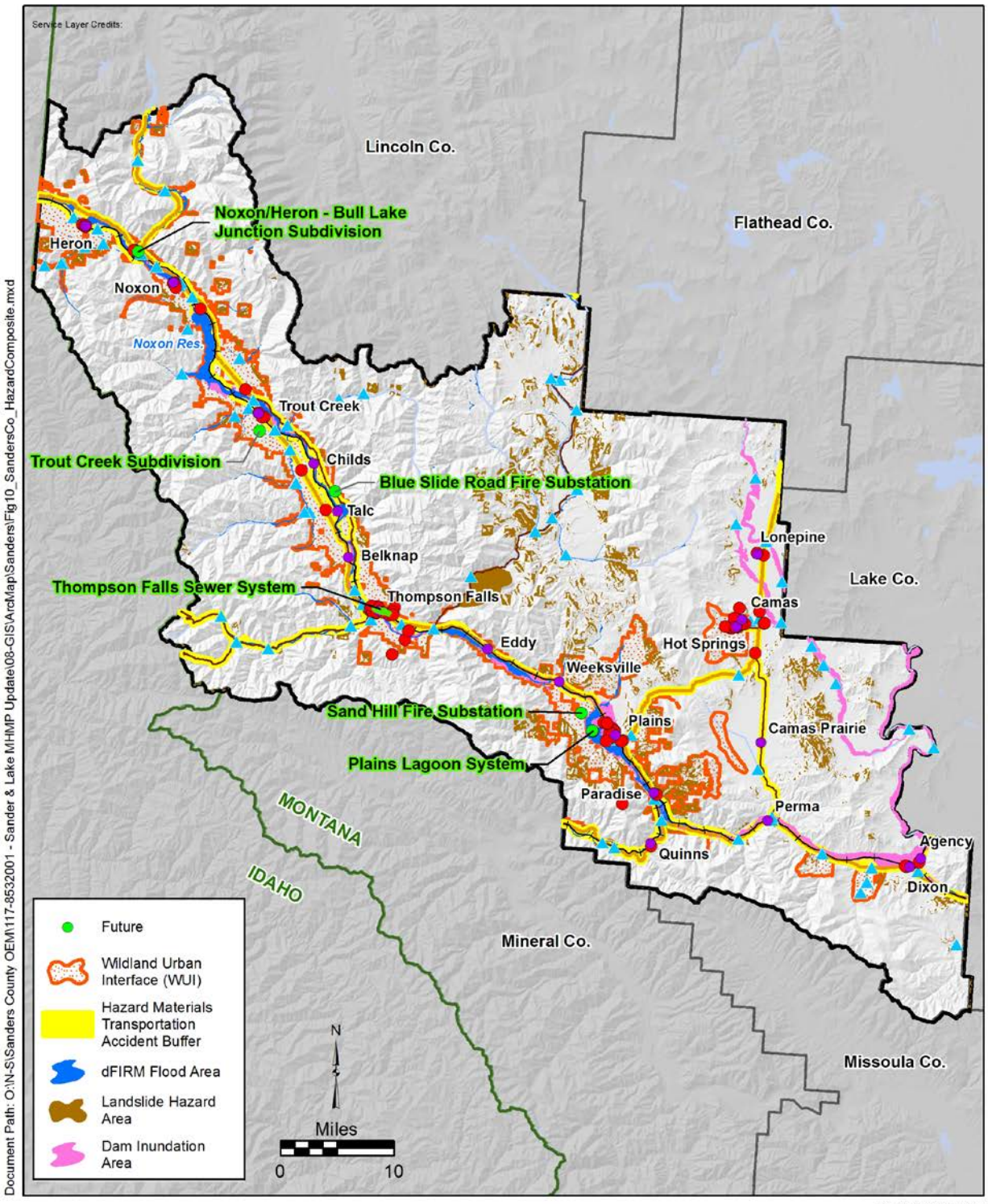
Growth policies for the Towns of Plains and Hot Springs (2014) were reviewed for potential future development projects. The MHMP Planning Team also weighed in on future development projects that had the potential to be constructed in the next five years. **Figures 10, 10A, 10B, and 10C** present potential future development projects with the composite of hazard prone areas in Sanders County, Thompson Falls, Plains, and Hot Springs, respectively. The hazard composite map is an overlay of the wildfire, flooding, hazardous material incident, landslide, and dam failure hazard. **Table 4.10-1** indicates which hazards each of the future development areas are exposed to.

Table 4.10-1. Future Development Summary

Proposed Project	Hazard Areas							
	Wildfire	Haz-Mat & Transport. Accidents	Severe Weather & Drought	Flooding	Terrorism, Violence, Civil Unrest & Cyber Security	Disease	Landslide	Dam Failure
Sand Hill Fire Substation	Yes	No	Yes	No	Yes	Yes	No	No
Trout Creek Subdivision	Yes	No	Yes	No	Yes	Yes	No	No
Noxon/Heron - Bull Lake Junction Subdivision	Yes	Yes	Yes	No	Yes	Yes	No	No
Plains Lagoon System	No	No	Yes	Yes	Yes	Yes	No	Yes
Thompson Falls area – Blue Slide Rd. Fire Substation	Yes	Yes	Yes	No	Yes	Yes	No	No
Thompson Falls Sewer System	Yes	Yes	Yes	No	Yes	Yes	No	No

Vulnerability Analysis - Loss Estimation Summary

Estimating potential losses and calculating risk requires evaluating where hazard areas and vulnerabilities to them coincide, how frequently the hazards occur, and then estimating the magnitude of damage resulting from a hazard event. Rather than estimating loss, a vulnerability assessment was completed which estimates building stock and population exposure. *Section 4.1* presents the methodology for the vulnerability assessment completed for the 2019 MHMP. **Tables 4.10-2 through 4.10-5** present the results of the vulnerability assessment for each hazard for residential and commercial/industrial structures, critical facilities, bridges, and population in Sanders County, Thompson Falls, Plains, and Hot Springs, respectively. **Appendix C** contains supporting documentation.



Legend

- Town
- Critical Facility
- Bridge
- Railroad
- MT Highway
- Secondary Road
- River
- Lake/Reservoir
- County Boundary

Date: 2/18/2019

Figure 10

Hazard Composite - Sanders County

Sanders County, Montana

Multi-Hazard Mitigation Plan

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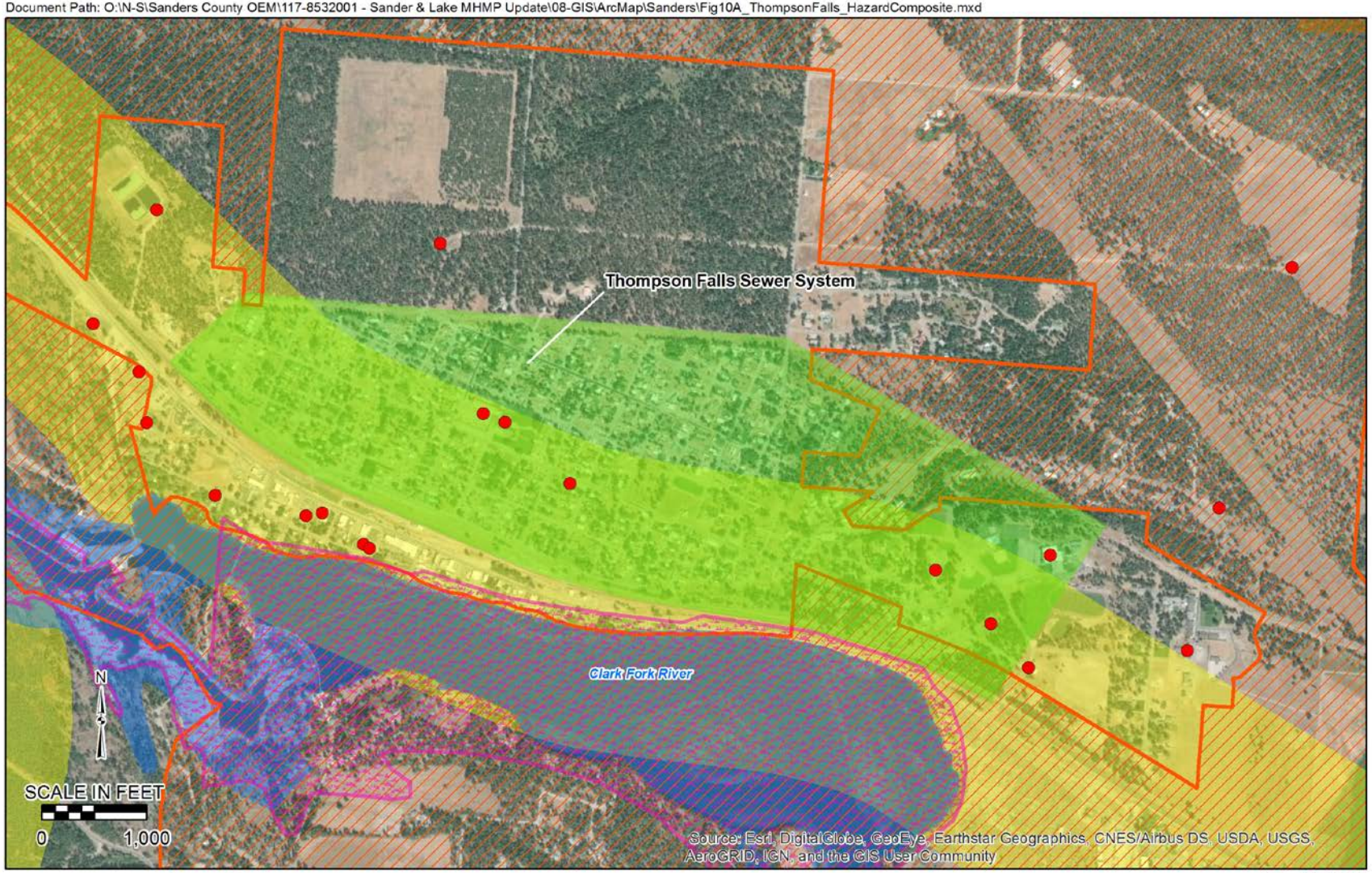

Legend

- Critical Facility
- Future Development
- Wildland Urban Interface (WUI)
- Hazard Materials Transportation Accident Buffer
- dFIRM Flood Area
- Landslide Hazard Area
- Dam Inundation Area

Date: 2/14/2019

Figure 10A
Hazard Composite - Thompson Falls
Sanders County, Montana
Multi-Hazard Mitigation Plan

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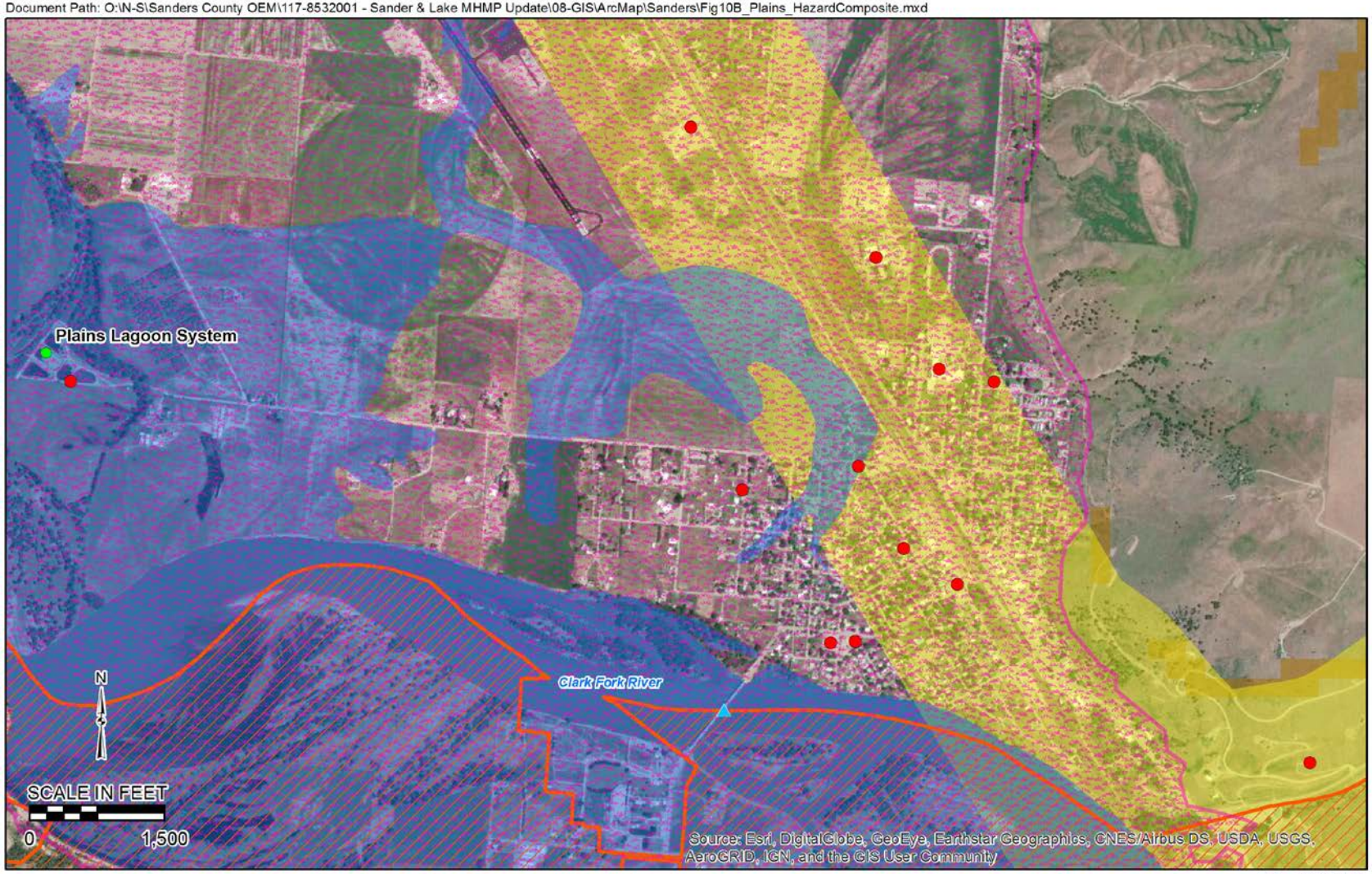


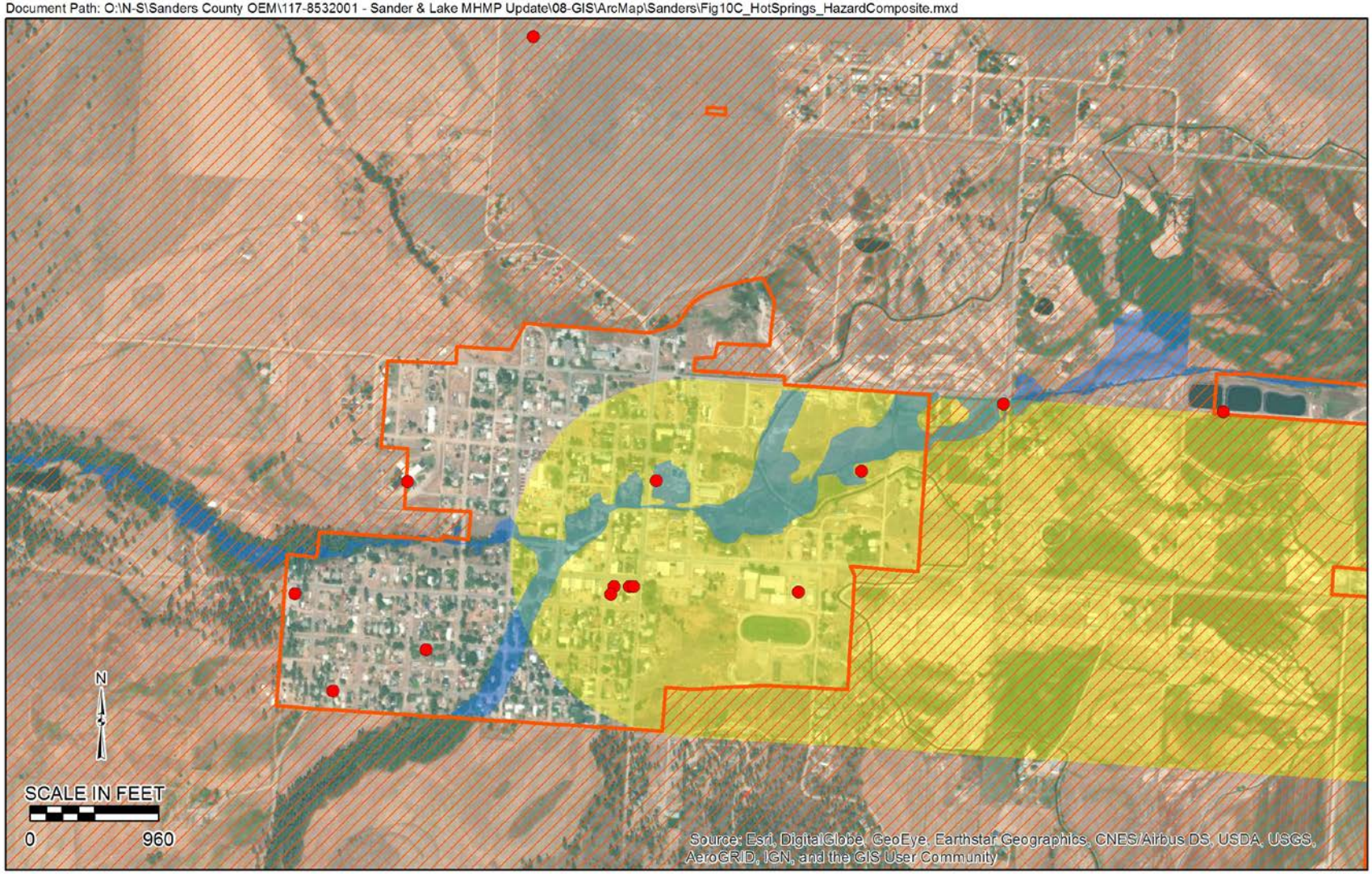
Date: 2/14/2019

Legend

- Future Development
- Bridge
- Critical Facility
- Wildland Urban Interface (WUI)
- Hazard Materials Transportation Accident Buffer
- dFIRM Flood Area
- Landslide Hazard Area
- Dam Inundation Area

Figure 10B
Hazard Composite - Plains
Sanders County, Montana
Multi-Hazard Mitigation Plan

Document Path: O:\N-S\Sanders County OEM\117-8532001 - Sander & Lake MHMP Update\08-GIS\ArcMap\Sanders\Fig10C_HotSprings_HazardComposite.mxd



Date: 2/14/2019

Legend

- Future Development
- Critical Facility
- Bridge
- Wildland Urban Interface (WUI)
- Hazard Materials Transportation Accident Buffer
- dFIRM Flood Area
- Landslide Hazard Area
- Dam Inundation Area

Figure 10C
Hazard Composite - Hot Springs
Sanders County, Montana
Multi-Hazard Mitigation Plan

Table 4.10-2. Hazard Vulnerability Summary; Sanders County (balance)

Hazard	Residential Building Stock - $ Exposure in Hazard Area	# Residential Structures in Hazard Area	Commercial/Ag & Industrial Building Stock - $ Exposure in Hazard Area	# Commercial/Ag & Industrial Structures in Hazard Area	Critical Facility $ Exposure in Hazard Area	# Critical Facilities Exposure in Hazard Area	Bridge Exposure $	# Bridges in Hazard Area	Persons in Hazard Area	Under 18 in Hazard Area	Over 65 in Hazard Area
Wildfire	$335,191,155	2,615	$223,710,121	1,273	$27,232,422	26	$51,708,800	35	3,506	1,179	2,032
Haz-Mat & Transportation Accidents	$179,581,335	1,604	$103,338,136	569	$34,530,830	34	$61,987,320	35	2,154	726	1,230
Severe Weather & Drought	$549,109,528	4,861	$312,122,783	1,818	$142,082,507	94	$76,534,020	77	7,238	2,437	4,264
Flooding	$20,430,781	133	$9,195,818	60	$6,048,113	3	$55,895,400	36	183	62	98
Terrorism, Violence, Civil Unrest & Cyber Security	$549,109,528	4,861	$312,122,783	1,818	$142,082,507	94	$76,534,020	77	7,238	2,437	4,264
Disease	$549,109,528	4,861	$312,122,783	1,818	$142,082,507	94	$76,534,020	77	7,238	2,437	4,264
Landslide	$9,554,664	67	$14,139,702	72	$0	0	$620,000	2	79	27	42
Dam Failure	$124,786,464	988	$38,984,800	208	$26,332,155	20	$57,355,420	32	1,287	433	683

Table 4.10-3. Hazard Vulnerability Summary; Thompson Falls

Hazard	Residential Building Stock - $ Exposure in Hazard Area	# Residential Structures in Hazard Area	Commercial/Ag & Industrial Building Stock - $ Exposure in Hazard Area	# Commercial/Ag & Industrial Structures in Hazard Area	Critical Facility $ Exposure in Hazard Area	# Critical Facilities Exposure in Hazard Area	Bridge Exposure $	# Bridges in Hazard Area	Persons in Hazard Area	Under 18 in Hazard Area	Over 65 in Hazard Area
Wildfire	$0	0	$0	0	$0	0	$0	0	0	0	0
Haz-Mat & Transportation Accidents	$35,982,820	384	$15,000,798	72	$25,431,752	16	$0	0	687	231	448
Severe Weather & Drought	$56,202,836	623	$15,562,703	77	$38,718,171	20	$0	0	1,060	357	647
Flooding	$0	0	$173,132	1	$0	0	$0	0	0	0	0
Terrorism, Violence, Civil Unrest & Cyber Security	$56,202,836	623	$15,562,703	77	$38,718,171	20	$0	0	1,060	357	647
Disease	$56,202,836	623	$15,562,703	77	$38,718,171	20	$0	0	1,060	357	647
Landslide	$0	0	$0	0	$0	0	$0	0	0	0	0
Dam Failure	$2,504,397	17	$664,266	5	$0	0	$0	0	45	16	25

Table 4.10-4. Hazard Vulnerability Summary; Plains

Hazard	Residential Building Stock - $ Exposure in Hazard Area	# Residential Structures in Hazard Area	Commercial/Ag & Industrial Building Stock - $ Exposure in Hazard Area	# Commercial/Ag & Industrial Structures in Hazard Area	Critical Facility $ Exposure in Hazard Area	# Critical Facilities Exposure in Hazard Area	Bridge Exposure $	# Bridges in Hazard Area	Persons in Hazard Area	Under 18 in Hazard Area	Over 65 in Hazard Area
Wildfire	$0	0	$0	0	$0	0	$0	0	0	0	0
Haz-Mat & Transportation Accidents	$29,522,553	373	$16,985,671	82	$32,671,113	6	$0	0	687	231	448
Severe Weather & Drought	$42,566,288	533	$17,084,101	83	$33,254,547	8	$0	0	1,045	352	639
Flooding	$2,639,855	37	$0	0	$262,989	1	$0	0	83	28	44
Terrorism, Violence, Civil Unrest & Cyber Security	$42,566,288	533	$17,084,101	83	$33,254,547	8	$0	0	1,045	352	639
Disease	$42,566,288	533	$17,084,101	83	$33,254,547	8	$0	0	1,045	352	639
Landslide	$0	0	$0	0	$0	0	$0	0	0	0	0
Dam Failure	$42,566,288	533	$17,084,101	83	$33,254,547	4	$0	0	1,045	352	639

Table 4.10-5. Hazard Vulnerability Summary; Hot Springs

Hazard	Residential Building Stock - $ Exposure in Hazard Area	# Residential Structures in Hazard Area	Commercial/Ag & Industrial Building Stock - $ Exposure in Hazard Area	# Commercial/Ag & Industrial Structures in Hazard Area	Critical Facility $ Exposure in Hazard Area	# Critical Facilities Exposure in Hazard Area	Bridge Exposure $	# Bridges in Hazard Area	Persons in Hazard Area	Under 18 in Hazard Area	Over 65 in Hazard Area
Wildfire	$0	0	$0	0	$0	0	$0	0	0	0	0
Haz-Mat & Transportation Accidents	$11,897,655	135	$5,124,411	39	$8,866,955	7	$0	0	381	128	203
Severe Weather & Drought	$28,624,052	339	$6,638,070	45	$9,729,908	11	$0	0	686	231	447
Flooding	$1,296,399	15	$620,397	4	$145,000	1	$0	0	31	10	16
Terrorism, Violence, Civil Unrest & Cyber Security	$28,624,052	339	$6,638,070	45	$9,729,908	11	$0	0	686	231	447
Disease	$28,624,052	339	$6,638,070	45	$9,729,908	11	$0	0	686	231	447
Landslide	$0	0	$0	0	$0	0	$0	0	0	0	0
Dam Failure	$0	0	$0	0	$0	0	$0	0	0	0	0

SECTION 5. MITIGATION STRATEGIES

This section of the MHMP presents mitigation actions for Sanders County, the City of Thompson Falls, and towns of Plains and Hot Springs. The purpose of the mitigation strategy is to reduce potential exposure and losses from natural, man-made, and technological hazards. The MHMP Planning Team reviewed the Risk Assessment and Vulnerability Analysis to identify and develop the mitigation actions comprising the Sanders County mitigation strategy.

This section includes:

1. Background and Past Mitigation Accomplishments
2. General Mitigation Planning Approach
3. Mitigation Goals and Objectives
4. Capability Assessment
5. Mitigation Strategy Development

> ***Hazard mitigation*** reduces the potential impacts of, and costs associated with, emergency and disaster-related events. Mitigation actions address a range of impacts, including impacts on the population, property, the economy, and the environment.
> ***Mitigation actions*** can include activities such as: revisions to land-use planning, training and education, and structural and nonstructural safety measures.

5.1 Background and Past Mitigation Accomplishments

In accordance with DMA 2000 requirements, a discussion regarding past mitigation activities and an overview of past efforts is provided as a foundation for understanding the mitigation goals, objectives, and activities outlined in this Plan. The County, through previous and ongoing hazard mitigation activities, has demonstrated that it is pro-active in protecting its physical assets and citizens against losses from natural hazards. Completed and ongoing projects since the 2012 PDM Plan was adopted include the following:

Wildfire

- Volunteer Fire Depts. in Sanders County have received wildfire firefighting training from Montana DNRC. Refresher training is offered annually.
- Several VFDs applied for and secured grants for purchasing and/or replacing equipment including turnouts and radios. The Plains-Paradise RFD received an Assistance to Firefighter Grant which funded purchase of larger equipment. Montana DNRC has assisted the local fire depts. with their grant applications.
- High risk fire areas have been mapped in Sanders County.
- Community and individual landowner meetings have taken place, as well as news releases and other notifications, to expand awareness of the hazardous fuel programs in the county. The Sanders County and DNRC websites are updated frequently during the fire season with preparedness information.
- Water systems in Thompson Falls and Heron have been upgraded to assist with wildfire suppression. In addition, storage tanks have been placed in various locations around the county.
- Several access roads have been improved for evacuation and firefighter safety including pavement on Cherry Creek Road and widening/straightening of River Road (Swamp Creek).
- Sanders County secured the services of a community forester/fire plan coordinator and updated their CWPP in 2012.

- Aerial photo flights have occurred over much of the forested lands in Sanders County to identify insect- and disease-affected acreage.
- Sanders County monitored and participated in local planning efforts with the DNRC, Kootenai and Lolo National Forests, and CSKT and have inter-agency mutual aid agreements in place. An effort is being made to develop a single Mutual Aid Agreement for the county.
- The U.S. Forest Service has ongoing fuel reduction projects including the Little Beaver Creek drainage, Swamp Creek, Trout Creek and Minton Peak projects.

Haz-Mat Incidents & Transportation Accidents

- Montana Rail Link has done outreach to RFDs in Sanders County on responding to hazardous material incidents.
- All bulk fuel and chemical dealers in Sanders County have secured their facilities with fencing, in compliance with federal regulations.
- At the request of the LEPC, Montana Rail Link installed an at-grade crossing to accommodate wheelchairs in Plains.
- Montana Rail Link has installed crossing identification and stop or yield signs at each crossing in Sanders Co., in compliance with federal regulations.
- An egress road was graveled in Thompson Falls and can now be used as a railroad crossing for evacuation if other crossings in town are blocked by trains.

Severe Weather and Drought

- Sanders County OEM makes available brochures published by MDT on winter weather survival in public places.
- The National Weather Service implements preparedness campaigns through social media when bad weather patterns are shaping up.
- Sanders County, MDT, CSKT, and municipalities utilize the LEPC to discuss coordinated road management for plowing, de-icing, and clearing trees.
- Drought information is provided via agency websites and networking with farmers. Supplemental feed and funding for grasshopper spraying has been provided.
- The Sanders County Drought Committee, comprised of regional and local partners, advises municipalities when mandatory conservation measures are in order.

Flooding

- Several culvert upgrades were completed at Thompson River and in the Hot Springs area to improve conveyance of flood waters.
- The Town of Plains completed stormwater projects on several streets and the Town of Hot Springs replaced several storm drains to reduce impacts from flooding.
- Brochures on the National Flood Insurance Program are available at the Sanders Co. Land Services office.
- The National Weather Service conducts conference calls with Sanders County OEM on flood preparedness and information is disseminated to the public through social media leading up to flood events.

Terrorism, Violence, Civil Unrest & Cyber Security

- Law enforcement and first responders have received armed intruder/active shooter training.
- Existing and new employees receive training on network and cyber security.
- Regular assessments are made of critical cyber infrastructure including fire walls and networks.
- Vulnerability assessments have been completed at various critical facilities with recommendations for physical hardening.

Communicable Disease

- The Sanders Co. Public Health Dept. provides surveillance, disease investigations, and vaccination clinics as well as education on disease prevention, sanitation and healthy living.

Landslide

- Several landslide-prone areas have been identified in Sanders County and are maintained by the responsible jurisdictions.

Dam Failure

- Sirens at the Noxon Rapids Dam are tested monthly and articles on siren testing are run periodically in the local newspaper.
- Sanders County participates in exercises with dam owners on an annual basis.

All Hazards

- Sanders County has implemented Hyper-Reach as their reverse-911 software and has campaigned to get residents to sign up their phone numbers.
- Sanders County continually recruits first responders through print media and word-of-mouth.
- Basic Incident Command System training is provided to all first responders, as well as refresher training annually.
- LEPC meetings are utilized to coordinate emergency response activities between the county, municipalities, CSKT, industry, railroad, and state and federal agencies.
- The locations where emergency generators are needed have been identified; however, funding is a major obstacle to project implementation.
- Awareness on developing Family Disaster Plans and disaster supply kits is promoted at community events and by the Chamber of Commerce.

5.2 General Mitigation Planning Approach

The overall approach used to update the Sanders County mitigation strategy was based on FEMA guidance regarding local mitigation plan development, including:

- DMA 2000 regulations, specifically 44 CFR 201.6 (local mitigation planning)
- FEMA "Local Mitigation Planning Handbook", March 2013
- FEMA "Integrating Hazard Mitigation into Local Planning", March 2013

- Identifying Mitigation Actions and Implementing Strategies (FEMA 386-3)
- FEMA "Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards", January 2013

The mitigation strategy approach includes the following steps that are further detailed in this section of this Plan:

- Review and update mitigation goals and objectives.
- Identify mitigation capabilities and evaluate their capacity and effectiveness to mitigate and manage hazard risk.
- Identify past and ongoing mitigation activities throughout the County.
- Identify appropriate county and local mitigation strategies to address the regions risk to natural and man-made hazards.
- Prepare an implementation strategy, including the prioritization of projects in the mitigation strategy.

5.3 Mitigation Goals and Objectives

This section documents the efforts to develop hazard mitigation goals and objectives established to reduce or avoid long-term vulnerabilities to the identified hazards.

According to CFR 201.6(c)(3)(i): "The hazard mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards." For the purposes of this plan, goals are general guidelines that explain what is to be achieved. They are usually broad, long-term, policy-type statements and represent global visions. Goals help define the benefits that the plan is trying to achieve. The success of the plan, once implemented, should be measured by the degree to which its goals have been met (that is, by the actual benefits in terms of hazard mitigation).

FEMA defines ***Goals*** as general guidelines that explain what should be achieved. Goals are usually broad, long-term, policy statements, and represent a global vision.
FEMA defines ***Objectives*** as strategies or implementation steps to attain mitigation goals. Unlike goals, objectives are specific and measurable, where feasible.
FEMA defines ***Mitigation Actions*** as specific actions that help to achieve the mitigation goals and objectives.

The 2012 Sanders County PDM Plan had 12 goals; one goal specific to each of 11 hazards and an all hazard goal. This methodology is consistent with goals outlined in the 2019 MHMP Update.

Mitigation objectives developed for the 2019 Sanders County MHMP Plan were generally consistent with those outlined in the 2012 PDM Plan. Where appropriate, mitigation objectives reflect FEMA's "Local Mitigation Planning Handbook, March 2013" guidelines (see *Section 5.5.1*) as either: Public Education and Awareness, Property Protection, Prevention, Structural, Natural Resource Protection, or Emergency Services, with an objective added for Planning/Analysis/Mapping projects. Mitigation goals and objectives for the 2019 Plan are presented in **Table 5.3-1**.

Table 5.3-1. Summary of Goals and Objectives

Goal #	Goal Statement	Objective #	2019 Goal/Objective Statement
1	Reduce Impacts from Wildfire	1.1	Enhance Emergency Service Capabilities to Reduce Impacts from Wildfire
		1.2	Implement Property Protection Projects to Reduce Impacts from Wildfire
		1.3	Implement Structural Projects to Reduce Impacts from Wildfire
		1.4	Implement Public Education and Awareness Projects to Reduce Impacts from Wildfire
		1.5	Implement Planning, Mapping, and/or Analysis Projects to Reduce Impacts from Wildfire
		1.6	Implement Prevention Projects to Reduce Impacts from Wildfire
2	Reduce Impacts from Haz-Mat Incidents & Transportation Accidents	2.1	Enhance Emergency Service Capabilities to Reduce Impacts from Haz-Mat Incidents and Transportation Accidents
		2.2	Implement Public Education and Awareness Projects to Reduce Impacts from Haz-Mat Incidents and Transportation Accidents
3	Reduce Impacts from Severe Weather and Drought	3.1	Implement Public Education and Awareness Projects to Reduce Impacts from Severe Weather and Drought
		3.2	Enhance Emergency Services Capabilities to Reduce Impacts from Severe Weather and Drought
		3,3	Implement Planning, Mapping and Analysis Projects to Reduce Impacts from Severe Weather and Drought
4	Reduce Impacts from Flooding	4.1	Implement Structural Projects to Reduce Impacts from Flooding
		4.2	Implement Public Education and Awareness Projects to Reduce Impacts from Flooding
		4.3	Implement Property Protection Projects to Reduce Impacts from Flooding
5	Reduce Impacts from Terrorism, Violence, Civil Unrest, and Cyber Security	5.1	Enhance Emergency Services Capabilities to Reduce Impacts from Terrorism, Violence, Civil Unrest, and Cyber Security
		5.2	Implement Structural Projects to Reduce Impacts from Terrorism, Violence, Civil Unrest, and Cyber Security
		5.3	Implement Public Education and Awareness Projects to Reduce Impacts from Terrorism, Violence, Civil Unrest, and Cyber Security
6	Reduce Impacts from Communicable Disease	6.1	Implement Prevention Projects to Reduce Impacts from Communicable Disease
		6.2	Implement Public Education and Awareness Projects to Reduce Impacts from Communicable Disease
7	Reduce Impacts from Landslide	7.1	Implement Property Protection Projects to Reduce Impacts from Landslides
8	Reduce Impacts from Dam Failure	8.1	Implement Public Education and Awareness Projects to Reduce Impacts from Dam Failure
		8.2	Enhance Emergency Service Capabilities to Reduce Impacts from Dam Failure
9	Reduce Impacts from All Hazards	9.1	Enhance Emergency Service Capabilities to Reduce Impacts from All Hazards
		9.2	Implement Public Education and Awareness Projects to Reduce Impacts from All Hazards

5.4 Capability Assessment

The goals and objectives used to mitigate natural and technological hazards build on the community's existing capabilities. Sanders County's capabilities to support and implement mitigation projects include the programs and resources of various local, regional, tribal, state, and federal partners and the administrative and technical capabilities of county and city/town staff who implement the legal

and regulatory requirements used to manage growth (zoning, building codes, subdivision regulations, and floodplain ordinances).

Sanders County's hazard mitigation capabilities are summarized below. These resources have the responsibility to provide overview of past, current, and ongoing pre- and post-disaster mitigation projects including capital improvement programs, wildfire mitigation programs, stormwater management programs, and NFIP compliance projects. The fiscal capabilities of Sanders County, Thompson Falls, Plains, and Hot Springs support hazard mitigation planning and provide the funding to implement the mitigation strategy.

5.4.1 Summary of Programs and Resources Available to Support Mitigation

A number of programs and resources are available to Sanders County to support mitigation efforts. These are described below.

National Flood Insurance Program

The NFIP is aimed at reducing the impact of flooding on private and public structures. This is achieved by providing affordable insurance for property owners and by encouraging communities to adopt and enforce floodplain management regulations. These efforts help mitigate the effects of flooding on new and improved structures. Overall, the program reduces the socio-economic impact of disasters by promoting the purchase and retention of Risk Insurance in general, and NFIP in particular.

NFIP Community Rating System

As an additional component of the NFIP, the Community Rating System is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS: (1) reduce flood losses; (2) facilitate accurate insurance rating; and (3) promote the awareness of flood insurance. Sanders County and the communities of Thompson Falls, Plains, and Hot Springs do not currently participate in the CRS program.

5.4.2 Administrative and Technical Capabilities

Sanders County's administrative and technical capabilities to implement mitigation projects include planners, contract engineers and floodplain managers, in-house GIS personnel, emergency managers, and financial, legal and regulatory requirements. Expertise from local and regional planning partners also contribute to mitigation capabilities for the County and communities of Thompson Falls, Plains, and Hot Springs. Several of these entities are described below. **Table 5.4-1** summarizes the capabilities of the jurisdictions adopting this MHMP to accomplish hazard mitigation. *Section 3.7* provides additional discussion on many of these policies.

Table 5.4-1. Capability Assessment Summary

Capability	Sanders County	City of Thompson Falls	Town of Plains	Town of Hot Springs
Population (2016/17 est.)	11,711	1,378	1,093	562
Policies and Programs				
Growth Policy that Supports Hazard Mitigation	No	No	Yes	Yes
Subdivision Regulations that Support Hazard Mitigation	Yes	Yes	Yes	Yes
Zoning that Recognizes Hazard Areas	No	Yes	Yes	Yes
National Flood Insurance Program Participation	Yes	No	Yes	Yes
Local Building Codes	No	Follow State	Follow State	Follow State
Technical Capabilities				
Emergency Manager	Yes	No	No	No
Public Works Engineer	Contract when needed	Contract when needed	Contract when needed	Contract when needed
GIS Mapping Capabilities	Yes	No	No	No
Floodplain Administrator	Yes	No	Yes	Yes
Community Planners	Yes	Planning Board	Planning Board	No

Sanders County Office of Emergency Management

The mission of Sanders County OEM is to save lives, prevent injury, and protect property and the environment by taking reasonable and affordable measures to mitigate, prepare for, respond to and recover from disasters. The Sanders County OEM director is responsible for the planning, coordination, and implementation of all emergency management and Homeland Security related activities for the county. Other responsibilities include coordination of activities for the county's Emergency Operations Center (EOC). The EOC, when activated, is a central location where representatives of local government and private sector agencies convene during disaster situations to make decisions, set priorities and coordinate resources for response and recovery. These efforts are designed to enhance the capacity of the local government to plan for, respond to, and mitigate the consequences of threats and disasters using an all-hazard framework.

The Sanders County OEM office includes one three-quarters time position; the Emergency Manager (DES Coordinator) who devotes 100 percent of their time to emergency management, is the Fire Warden and Chairman of the LEPC. This position is funded 50 percent federal through the Emergency Management Performance Grant (EMPG) program and 50 percent through the County general fund. A volunteer serves as a deputy DES Coordinator and is available, as needed.

Local Emergency Planning Committee

The mission of the Sanders County LEPC is to provide resources and guidance to the community through education, coordination and assistance in haz-mat planning; and to assure public health and safety. They do not function in actual emergency situations, but attempt to identify and catalogue potential hazards, identify available resources, and mitigate hazards when feasible. The LEPC consists of representatives from businesses, local government, emergency responders and citizen groups located in Sanders County. Meetings are held every other month and rotate locations between Thompson Falls, Plains, and Noxon.

Sanders County Land Services and Local Planning Boards

The Land Services Department administers the Sanders County Subdivision Regulations, Floodplain Regulations, and Encroachment/Driveway Permits. They consult with the County Clerk and Recorder for clerical errors and omissions on certificates of surveys and to ensure exempt divisions of land are in compliance with the provisions outlined in the Montana Subdivision and Platting Act. The department also prepares recommendations for the Sanders County Commissioners on all land development submittals. The City of Thompson Falls and Town of Plains have Planning Boards that are responsible for making land use decisions within their municipal boundaries.

Sanders County Fire Protection Services

There are four wildland fire protection agencies in Sanders County; Sanders County Fire Departments, Montana DNRC, CSKT, and the U.S. Forest Service Kootenai and Lolo National Forests. Through mutual aid agreements, firefighters from each of these agencies are able to unify and assist each other with wildfires.

Sanders County has an all-volunteer fire fighting force. There are nine fire districts and/or fire departments including: Dixon RFD, Heron RFD, Hot Springs RFD, Noxon Volunteer Fire Department, Plains City Fire Department, Plains/Paradise RFD, Thompson Falls City Fire Department, Thompson Falls RFD, and Trout Creek RFD. All fire departments train in both wildland and structural firefighting and maintain mutual aid agreements through the Sander County Association of Firefighters.

Confederated Salish and Kootenai Tribes

The CSKT is responsible for direct protection to certain lands within the boundaries of the Flathead Indian Reservation. About one third of the reservation lies in Sanders County. Lands on the reservation that the CSKT is responsible by congressional mandate to protect include all lands owned by the tribes as well as trust and allotment lands. In addition, the state has contracted the CSKT to protect all state-owned lands on the reservation, as well as all privately-owned forested lands. The only areas of the reservation that they are not responsible for fire protection on are the privately owned non-forested lands, and lands within incorporated city limits. In the past, however, the CSKT has responded to all wildfires on the reservation, because of the intermingled land ownership patterns. These actions are taken because almost any wildfire on the reservation constitutes a threat to lands under CSKT protection.

U.S. Forest Service

There are portions of two National Forests (NF) lying within Sanders County. The Kootenai NF – Administered by the Cabinet Ranger District office in Trout Creek. Lolo NF – Administered by the Plains Thompson Falls Ranger District office in Plains. And a small portion where the Clark Fork River enters the county is administered by the Superior Ranger District in Superior. Both Forests provide direct fire protection within their respective protection boundaries. The U.S. Forest Service's primary protection responsibility is National Forest Land, whether forested or not. But it also protects state and private forested lands within its jurisdictional boundary through a protection exchange with the State of Montana. Both the Kootenai and the Lolo NFs also each support fire prevention specialists who work individually and cooperatively with the Sanders County Fire Planning Committee.

Fire management on the forest encompasses a variety of tools including fuel management, prescribed burning, fire prevention and smoke management. By using these tools, protection of private land, management of the forest and air quality can be enhanced.

Montana DNRC

The Forestry Division, of the Montana DNRC is responsible for planning and implementing forestry and fire management programs through an extensive network of staff located in field offices across the State. The Fire and Aviation Management Bureau provides resources, leadership and coordination to Montana's wildland fire services to protect lives, property, and natural resources; working with local, tribal, state, and federal partners to ensure wildfire protection on all state and private land in Montana. There are numerous programs aimed at effective fire preparedness and capacity building. The Fire Preparedness effort is focused in four areas:

- Fire Prevention Program seeks to educate Montanans about fire risk, the wildland urban interface and reducing human-caused fires;
- Fire Training Program provides statewide training opportunities for DNRC and local government personnel;
- Equipment Development Center builds and maintains wildland fire equipment and radio communications;
- Fire Support Programs provide financial and technical expertise to assist all fire programs in meeting their respective goals and mandates. These include, but not limited to: Fire Assessment fees, GIS, repair and maintenance of radio systems and rolling stock equipment.

Montana DNRC is responsible for fire protection on state and private lands statewide. The Plains Unit of the Northwestern Land Office of DNRC has two major wildfire responsibilities in Sanders County: direct protection of 275,000 acres of forested lands, and management of the State/County Collaborative Wildfire Group, a consortium of state, county, tribal, and federal partners. The Plains Unit has a fire prevention specialist, who promotes public fire awareness.

National Fire Prevention Association's (NFPA) FireWise Communities Program

NFPA's FireWise Communities Program encourages local solutions for safety by involving homeowners in taking individual responsibility for preparing their homes from the risk of wildfire. FireWise is a key component of Fire Adapted Communities – a collaborative approach that connects all those who play a role in wildfire education, planning and action with comprehensive resources to help reduce risk. The program is co-sponsored by the U.S. Forest Service, the U.S. Department of the Interior, and the National Association of State Foresters. To save lives and property from wildfire, NFPA's FireWise Communities program teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action now to prevent losses. They advocate playing a role in protecting ourselves and each other from the risk of wildfire.

Sanders County Health Department and Montana DPHHS

The mission of the Sanders County Health Department is to protect, improve, and preserve the health and wellbeing of the citizens of Sanders County. The County's public and environmental health programs are supported by the Montana Dept. of Public Health and Human Services whose mission is to improve and protect the health of Montanans to the highest possible level with objectives to

prevent and control communicable disease, and to prepare the public health system to respond to public health events and emergencies. The Public Health and Safety Division continuously monitors the proportion of children fully immunized and the number of local jurisdictions that participate in a public health emergency exercise every other year as measurement in achieving this goal.

Montana Governor's Drought and Water Supply Advisory Committee and Sanders County Drought Committee

The Montana Drought and Water Supply Advisory Committee serves as a clearinghouse for the sharing of water supply and moisture conditions on a monthly basis among state and local agency officials with responsibility to manage natural resources and support constituents most likely affected by drought. In its monthly assessment of conditions, the committee considers various scientific indicators that quantify and forecast precipitation, mountain snowpack, streamflow, soil moisture, reservoir contents, and agricultural and livestock production. The committee also provides planning support and information sharing with watershed groups and county drought committees through this website and staff contact.

Member agencies include the Governor's Office, DNRC, DEQ, Fish Wildlife and Parks, Agriculture, Livestock, Commerce, and DES. Federal reporting partners include the Bureau of Reclamation, U.S. Geological Survey, Natural Resource Conservation Service, Agricultural Statistics Service, and the National Weather Service. Other reporters include the multi-agency Northern Rockies Coordination Center for fire conditions, Montana Tech's Groundwater Information Center, Montana Climate Office, USDA Farm Service Agency, U.S. Congressional delegation representatives, U.S. Small Business Administration, Rural Development, and Montana State University Extension Service. The Sanders County Drought Committee is a sub-set of the state group that focuses on local conditions.

National Weather Service and NOAA Weather-Ready Nation Program

The National Weather Service provides weather, hydrologic, and climate data, forecasts and warnings for the United States, for the protection of life and property and the enhancement of the national economy. Its mission is to save lives and property, look onward to future challenges and achieve a Weather-Ready Nation. The NWS strives to improve weather decision services; deliver improved weather forecasting services to support management of the Nation's water supply; support enhanced climate services; and, integrate environmental forecasting services to support healthy communities and ecosystems.

The Weather-Ready Nation (WRN) Ambassador initiative is NOAA's effort to formally recognize NOAA partners who are improving the nation's readiness, responsiveness, and overall resilience against extreme weather, water, and climate events. As a WRN Ambassador, partners commit to working with NOAA and other Ambassadors to strengthen national resilience against extreme weather. In effect, the WRN Ambassador initiative helps unify the efforts across government, non-profits, academia, and private industry toward making the nation more ready, responsive, and resilient against extreme environmental hazards. WRN is a strategic outcome where society's response should be equal to the risk from all extreme weather, water, and climate hazards.

Bureau of Indian Affairs

The Bureau of Indian Affairs' mission is to enhance the quality of life, to promote economic opportunity, and to carry out the responsibility to protect and improve the trust assets of American Indians and Indian Tribes. The Office of Indian Services operates the BIA's general assistance, disaster relief, and reservation roads programs, among others.

5.4.3 Fiscal Capabilities

Mitigation projects and initiatives are largely or entirely dependent on available funding. Sanders County can fund mitigation projects though existing local budgets, local appropriations (including referendums and bonding), and through a myriad of federal and state loan and grant programs. A number of these funding opportunities are described below.

FEMA Hazard Mitigation Funding Opportunities

Federal mitigation grant funding is available to all communities with a current hazard mitigation plan (this plan); however most of these grants require a "local share" in the range of 10-25 percent of the total grant amount. The FEMA mitigation grant programs are described below.

FEMA, Hazard Mitigation Grant Program (HMGP). The HMGP is a post-disaster mitigation program. It is made available to states by FEMA after each federal disaster declaration. The HMGP can provide up to 75 percent funding for hazard mitigation measures. The HMGP can be used to fund cost-effective projects that will protect public or private property in an area covered by a federal disaster declaration or that will reduce the likely damage from future disasters. Examples of projects include acquisition and demolition of structures in hazard prone areas, flood-proofing or elevation to reduce future damage, minor structural improvements and development of state or local standards. Projects must fit into an overall mitigation strategy for the area identified as part of a local planning effort. All applicants must have a FEMA-approved Hazard Mitigation Plan (this plan).

Applicants who are eligible for the HMGP are state and local governments, certain nonprofit organizations or institutions that perform essential government services, and Indian tribes and authorized tribal organizations. Individuals or homeowners cannot apply directly for the HMGP; a local government must apply on their behalf. Applications are submitted to Montana DES and placed in rank order for available funding and submitted to FEMA for final approval. Eligible projects not selected for funding are placed in an inactive status and may be considered as additional HMGP funding becomes available.

Flood Mitigation Assistance (FMA) Program. The FMA combines the previous Repetitive Flood Claims and Severe Repetitive Loss Grants into one grant 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 NFIP. The FMA is funded annually; no federal disaster declaration is required. Only NFIP insured homes and businesses are eligible for mitigation in this program. Funding for FMA is very limited and, as with the HMGP, individuals cannot apply directly for the program. Applications must come from local governments or other eligible organizations. The federal cost share for an FMA project is 75 percent. At least 25 percent of the total eligible costs must be provided by a non-federal source. Of this 25 percent, no more than half can be provided as in-kind contributions from third parties. At minimum,

a FEMA-approved local flood mitigation plan is required before a project can be approved. FMA funds are distributed from FEMA to the state. Montana DES serves as the grantee and program administrator for FMA.

FEMA, Pre-Disaster Mitigation Competitive (PDMC) Grant Program**.** The PDM program is an annually funded, nationwide, competitive grant program. No disaster declaration is required. Federal funds will cover 75 percent of a project's cost up to $3 million. As with the HMGP and FMA, a FEMA-approved local Hazard Mitigation Plan is required to be approved for funding under the PDM program.

FEMA, Readiness, Response and Recovery Directorate, Fire Management Assistance Grant Program. This program provides grants to states, tribal governments and local governments for the mitigation, management and control of any fire burning on publicly (non-federal) or privately-owned forest or grassland that threatens such destruction as would constitute a major disaster. The grants are made in the form of cost sharing with the federal share being 75 percent of total eligible costs. Grant approvals are made within 1 to 72 hours from time of request.

Fire Prevention and Safety Grants. The Fire Prevention and Safety Grants (FP&S) are part of the Assistance to Firefighters Grants and are administered by the FEMA. FP&S Grants support projects that enhance the safety of the public and firefighters from fire and related hazards. The primary goal is to target high-risk populations and reduce injury and prevent death. Eligibility includes fire departments, national, regional, state, and local organizations, Native American tribal organizations, and/or community organizations recognized for their experience and expertise in fire prevention and safety programs and activities. Private non-profit and public organizations are also eligible. Interested applicants are advised to check the website periodically for announcements of grant availability. More information: https://www.fema.gov/welcome-assistance-firefighters-grant-program

Other Mitigation Funding Opportunities

Grant funding is available from a variety of federal and state agencies for training, equipment, and hazard mitigation activities. Several of these programs are described below.

U.S. Army Corps of Engineers Section 205 Program. Section 205 of the Flood Control Act of 1948, as amended, provides authority for the USACE to construct projects (either structural or nonstructural) to reduce damages caused by flooding. This authority focuses on solving local flood problems in urban areas, towns and communities. Under the Section 205 Program, the USACE can provide for local protection from flooding by the construction or improvement of flood control works. The types of studies and/or projects, which are tailored to be site specific, are either structural or nonstructural. Structural projects include levees, channel improvements, small dams and floodwalls. Nonstructural measures reduce flood damages by changing the use of floodplains or by accommodating existing uses to the flood hazard. Examples include flood proofing, relocation of structures, and flood warning and preparedness systems. The USACE oversees planning, design, and construction of flood risk management projects in close coordination with the project sponsor. Before the federal government can participate in implementing a Section 205 project, a planning study must be conducted to determine if the project is economically justified (benefits exceed the costs), technically feasible, and environmentally acceptable.

The feasibility study is initially 100 percent federally-funded up to $100,000. Any study costs over $100,000 are cost shared 50-50 between the USACE and the local sponsor. The sponsor's 50 percent can consist of any combination of cash and in-kind services. Once the feasibility study is complete, the remaining project cost is shared 65 percent federal and 35 percent non-federal. The sponsor's 35 percent share (minimum 5 percent cash) of the total project implementation cost consists of cash and Lands, Easements, Rights-of-way, Relocations, and Disposal areas (LERRDs) necessary for project construction. If the value of the LERRDs plus the minimum 5 percent cash contribution does not equal or exceed 35 percent of the project cost, the sponsor must pay the additional amount necessary so that the sponsor's total contribution equals 35 percent of the project cost. The federal investment in the solution is limited to a maximum of $10 million per project.

USACE Section 22 Program. Section 22 of the Water Resources Development Act of 1974, as amended, provides authority for the USACE to assist states, local governments, federally-recognized Indian Tribes and other non-federal entities in the preparation of comprehensive plans for the development, utilization and conservation of water and related land resources. Under the Section 22 Program, the USACE can provide technical planning assistance in all areas related to water resources development. Typical studies are only planning level of detail; they do not include detailed design for project construction. The studies generally involve the analysis of existing data for planning purposes using standard engineering techniques, although some data collection is often necessary. Most studies become the basis for state, tribal, or local planning decisions. The program can encompass many types of studies dealing with water resource issues including: flood damage reduction studies, bank stabilization studies, water quality studies, and sedimentation studies.

Section 22 is funded annually by Congress. Assistance is limited to $500,000 in federal funds per state or Tribe per year. Individual studies, of which there may be more than one per state or Tribe per year, generally range in cost from $25,000 to over $100,000. These studies are cost-shared on a 50/50 basis (50 percent federal/50 percent non-federal sponsor). The study sponsor has the option of providing in-kind services for up to 100 percent of its share of the study cost.

National Fire Plan Program 15.228: Wildland Urban Interface Community and Rural Fire Assistance. This program is designed to implement the National Fire Plan and assist communities at risk from catastrophic wildland fires. The program provides grants, technical assistance, and training for community programs that develop local capability, including: Assessment and planning, mitigation activities, and community and homeowner education and action; hazardous fuels reduction activities, including the training, monitoring or maintenance associated with such hazardous fuels reduction activities, on federal land, or on adjacent nonfederal land for activities that mitigate the threat of catastrophic fire to communities and natural resources in high risk areas; and, enhancement of knowledge and fire protection capability of rural fire districts through assistance in education and training, protective clothing and equipment purchase, and mitigation methods on a cost share basis. More information: http://www.federalgrantswire.com/wildland-urban-interface-community-and-rural-fire-assistance.html#.WCx8ekYzWUk

Secure Rural Schools and Community Self-Determination Act - Title III- County Funds. The Self-Determination Act has recently been reauthorized and now includes specific language regarding the FireWise Communities program. Counties seeking funding under Title III must use the funds to perform work under the FireWise Communities program. Counties applying for Title III funds to implement FireWise activities can assist in all aspects of a community's recognition process,

including conducting or assisting with community assessments, helping the community create an action plan, assisting with an annual FireWise Day, assisting with local wildfire mitigation projects, and communicating with the state liaison and the national program to ensure a smooth application process. Counties that previously used Title III funds for other wildfire preparation activities such as the Fire Safe Councils or similar would be able to carry out many of the same activities as they had before. However, with the new language, counties would be required to show that funds used for these activities were carried out under the FireWise Communities program. More information: http://www.fs.usda.gov/wps/portal/fsinternet/!ut/p/c4/04_SB8K8xLLM9MSSzPy8xBz9CP0os3gjAwhwtDDw9_AI8zPwhQoY6BdkOyoCAPkATlA!/?ss=119985&navtype=BROWSEBYSUBJECT&cid=FSE_003853&navid=091000000000000&pnavid=null&position=BROWSEBYSUBJECT&ttype=main&pname=Secure%20Rural%20Schools-%20Home

U.S. Fish & Wildlife Service, Rural Fire Assistance Grants. Each year, the U.S. Fish & Wildlife Service (FWS) provides Rural Fire Assistance (RFA) grants to neighboring community fire departments to enhance local wildfire protection, purchase equipment, and train volunteer firefighters. Service fire staff also assist directly with community projects. These efforts reduce the risk to human life and better permit FWS firefighters to interact and work with community fire organizations when fighting wildfires. The U.S. Dept. of the Interior (DOI) receives an appropriated budget each year for an RFA grant program. The maximum award per grant is $20,000. The DOI assistance program targets rural and volunteer fire departments that routinely help fight fire on or near DOI lands. More information: http://www.fws.gov/fire/living_with_fire/rural_fire_assistance.shtml

U.S. Bureau of Land Management, Community Assistance Program. BLM provides funds to communities through assistance agreements to complete mitigation projects, education and planning within the WUI. More information:
http://www.blm.gov/nifc/st/en/prog/fire/community_assistance.html

Fire Management Assistance Grants Program. This program is authorized under Section 420 of the Stafford Act. It allows for the mitigation, management, and control of fires burning on publicly or privately-owned forest or grasslands that threaten destruction that would constitute a major disaster. More information: http://www.fema.gov/fire-management-assistance-grant-program

U.S. Department of Agriculture, Community Facilities Loans and Grants. Provides grants (and loans) to cities, counties, states and other public entities to improve community facilities for essential services to rural residents. Projects can include fire and rescue services; funds have been provided to purchase fire-fighting equipment for rural areas. No match is required. More information: http://www.usda.gov/wps/portal/usda/usdahome?navid=GRANTS_LOANS

General Services Administration, Sale of Federal Surplus Personal Property. This program sells property no longer needed by the federal government. The program provides individuals, businesses and organizations the opportunity to enter competitive bids for purchase of a wide variety of personal property and equipment. Normally, there are no restrictions on the property purchased. More information: http://www.gsa.gov/portal/category/21045

Hazardous Materials Emergency Preparedness Grants. Grant funds are passed through to local emergency management offices and HazMat teams having functional and active LEPC groups. More information: http://www.phmsa.dot.gov/hazmat/grants

U.S. Department of Homeland Security. Enhances the ability of states, local and tribal jurisdictions, and other regional authorities in the preparation, prevention, and response to terrorist attacks and other disasters, by distributing grant funds. Localities can use grants for planning, equipment, training and exercise needs. These grants include, but are not limited to areas of Critical Infrastructure Protection Equipment and Training for First Responders, and Homeland Security Grants. More information: http://www.dhs.gov/

Community Development Block Grants (CDBG). The U.S. Department of Commerce administers the CDBG program which are intended to provide low and moderate-income households with viable communities, including decent housing, a suitable living environment, and expanded economic opportunities. Eligible activities include community facilities and improvements, roads and infrastructure, housing rehabilitation and preservation, development activities, public services, economic development, planning, and administration. Public improvements may include flood and drainage improvements. In limited instances, and during the times of "urgent need" (e.g. post disaster) as defined by the CDBG national objectives, CDBG funding may be used to acquire a property located in a floodplain that was severely damaged by a recent flood, demolish a structure severely damaged by an earthquake, or repair a public facility severely damaged by a hazard event. CDBG funds can be used to match FEMA grants. More Information: http://www.hud.gov/offices/cpd/communitydevelopment/programs/

Volunteer Fire Assistance Program Grants. The purpose of these grants is to organize, train and equip local firefighters to prevent and suppress wildfires. Communities under 10,000 in population are eligible for the funding. Smaller communities may join together in a group and or county effort to submit an application, even if their combined population is over 10,000. There is no pre-set award amount. Financial assistance on any project, during any fiscal year, requires a non-federal match for project expenditures. More information: http://dnrc.mt.gov/grants-and-loans

Conservation District Grants. This program provide funds to increase conservation district employee's hours to assist in planning, securing funding, and implementing programs that improve public outreach, improve conservation district administrative capabilities, and implement conservation plans. There is a $10,000 award amount. More information: http://dnrc.mt.gov/grants-and-loans

Western States Wildland Urban Interface. National Fire Plan funds are available to mitigate risk from wildland fire within the WUI. Funds are awarded through a competitive process to 22 western states and territories through the Western Wildland Urban Interface Grant Program. Each year, the Montana DNRC accepts proposals from partners around the state for submission to the National Fire Plan competitive process. The State scores and prioritizes these proposals before sending them on to the national competitive process. Non-profit organizations, conservation districts, county and municipal governments, and fire departments. Individual landowners may not apply but may be eligible for cost-share opportunities through this program. Each grant request is limited to a maximum of $300,000. More information: http://dnrc.mt.gov/grants-and-loans

Hazardous Fuel Reduction Grants. These grants are for hazardous fuel reduction on private lands to protect communities adjacent to National Forest System Lands where prescribed fire activities are planned. Prescribed fire activities must be imminent (to take place within 3 years of the award). Non-profit organizations, conservation districts, county and municipal governments, fire departments are

eligible for this funding. Award amounts typically range from $50,000 to $100,000 depending upon availability of funding. More information: http://dnrc.mt.gov/grants-and-loans

Renewable Resource Grant Program. Administered by the Montana DNRC, this program provides both grant and loan funding for public facility and other renewable resource projects. Projects that conserve, manage, develop or protect Montana's renewable resources are eligible for funding. Numerous public facility projects including drinking water, wastewater and solid waste development and improvement projects have received funding through this program. Other projects that have been funded include irrigation rehabilitation, dam repair, soil and water conservation and forest enhancement. More information: http://dnrc.mt.gov/grants-and-loans

5.5 Mitigation Strategy Development

This subsection discusses the identification, prioritization, analysis and implementation plan of mitigation actions for Sanders County and the communities of Thompson Falls, Plains, and Hot Springs.

5.5.1 Mitigation Strategy Update and Reconciliation

The Planning Team reviewed the list of mitigation actions (projects) from the 2012 PDM Plan and determined which were complete, should be deleted, or reworded for the 2019 mitigation strategy during bi-weekly Planning Team conference calls held between December 2018 and early February 2019. **Appendix D** presents a reconciliation of mitigation projects and their status.

Concerted efforts were made to assure that the county develop mitigation strategies that included activities and initiatives covering the range of mitigation action types described in FEMA planning guidance (FEMA "Local Mitigation Planning Handbook" March 2013), specifically:

- Prevention Projects – These actions include governmental regulatory authorities, including policies or codes that influence the way land and buildings are being developed and built.
- Property Protection Projects – Actions that involve the modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area. Examples include acquisition, elevation, relocations, structural retrofits, storm shutters, and shatter-resistant glass. Wildland fuel reduction projects are also included in this category.
- Structural Projects - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.
- Natural Resource Protection Projects – These are actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- Education and Awareness Programs – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as the National Flood Insurance Program and Community Rating System, StormReady (NOAA) and FireWise (NFPA) Communities.

- Emergency Service Projects – These are actions to enhance community preparedness through training and acquisition of equipment.
- Mapping/Analysis/Planning Projects – These actions include development of mapping and planning documents to assist with implementation of mitigation strategies.

In consideration of federal and state mitigation guidance, the MHMP Planning Team recognized that all communities would benefit from the inclusion of certain mitigation actions. These include initiatives to address vulnerable public and private properties, including repetitive loss properties; initiatives to support continued and enhanced participation in the NFIP; improved public education and awareness programs; and initiatives to support county-wide and regional efforts to build greater local mitigation capabilities.

Mitigation actions included in the 2019 Sanders County mitigation strategy are presented in **Table 5.5-2**. **Appendix D** contains a mitigation action plan with individual project worksheets.

5.5.2 Mitigation Strategy Benefit/Cost Review and Prioritization

Each of the proposed mitigation actions has value; however, time and financial constraints do not permit all projects to be implemented immediately. By prioritizing the actions, the most critical, cost effective projects can be achieved in the short term. Mitigation actions retained and developed for this updated MHMP were re-prioritized to reflect current conditions and anticipated needs over the next five years.

Section 201.6.c.3iii of 44CFR requires the prioritization of the action plan to emphasize the extent to which benefits are maximized according to a cost/benefit review of the proposed projects and their associated costs. Stated otherwise, cost-effectiveness is one of the criteria that must be applied during the evaluation and prioritization of all actions comprising the overall mitigation strategy.

The benefit/cost review used for the evaluation and prioritization of projects in this plan was qualitative; i.e. it does not include the level of detail required by FEMA for project grant eligibility under the HMGP and PDMC grant programs.

- **Costs** are the total cost for the action or project, and may include administrative costs, construction costs (including engineering, design and permitting), and maintenance costs.
- **Benefits** are the savings from losses avoided attributed to the implementation of the project, and may include life-safety, structure and infrastructure damages, loss of service or function, and economic and environmental damage and losses.

When available, jurisdictions were asked to identify the actual or estimated dollar value for project costs and associated benefits. Having defined costs and benefits allows a direct comparison of benefits versus costs, and a quantitative evaluation of project cost-effectiveness. Often, however, numerical costs and/or benefits have not been identified or may be impossible to quantitatively assess.

For the purposes of this planning process, a cost-benefit matrix was developed to rank the mitigation projects using the following criteria. Each project was assigned a "high", "medium", or "low" rank for *Population Impacted, Property Impacted*, *Project Feasibility* and *Cost*, as described below:

- For the *Population Protected* category, a "high" rank represents greater than 50 percent of County residents would be protected by implementation of the mitigation strategy; a "medium" rank represents 20 to 50 percent of County residents would be protected; and, a "low" rank represents less than 20 percent of County residents would be protected.
- For the *Property Protected* category, a "high" represents that greater than $500,000 worth of property would be protected through implementation of the mitigation strategy; "medium" represents that $100,000 to $500,000 worth of property would be protected; and, "low" would be less than $100,000 would be protected.
- For the *Project Feasibility* category, a "high" rank represents that technology is available and implementation is likely; a "medium" rank indicates technology may be available, but implementation could be difficult; and, a "low" rank represents that no technology is available or implementation would be unlikely.
- For the *Project Cost* category, a "high" represents that the mitigation project would cost more than $500,000; a "medium" rank represents the project cost would be between $100,000 and $500,000; and, "low" represents the project would cost less than $100,000.

The overall cost-benefit was then calculated by summing the total score for each project. **Table 5.5-1** presents the cost-benefit scoring matrix. The mitigation action plans in **Appendix D** present the scoring of each project.

Table 5.5-1. Cost-Benefit Scoring Matrix

Score	Population Protected	Property Protected	Project Feasibility	Cost
High	3	3	3	1
Medium	2	2	2	2
Low	1	1	1	3

After considering all mitigation projects, the MHMP Planning Team prioritized the projects as high, medium, or low based on which projects were most needed to protect life and property. Prioritization of the projects serves as a guide for choosing and funding projects. **Table 5.5-2** presents the County priority for each project.

5.5.3 Project Implementation

The MHMP Planning Team reviewed the projects and assigned a corresponding county, city/town department and/or cooperating organization responsible for its implementation. Cooperating organizations for implementation may include local, federal or regional agencies that are capable of implementing activities and programs. The Planning Team identified a schedule for implementation and potential funding sources. The schedule for implementation included several categories including: "ongoing" for projects that are part of the County's emergency management program; "short-term" for projects to be completed within 1-2 years; "mid-term" for projects to be completed within 3-4 years; and, "long-term" for projects to be completed in 5 or more years.

Implementation details are shown in **Table 5.5-3** and in the mitigation action plans in **Appendix D.** Sanders County OEM will be responsible for mitigation project administration.

Table 5.5-2. Sanders County 2019 Mitigation Strategy

Goal	Objective	Project	Hazard	Jurisdiction	Benefit-Cost Ranking/Score	County Priority
Goal 1 - Reduce Impacts from Wildfire	Objective 1.1 - Enhance Emergency Service Capabilities to Reduce Impacts from Wildfire	1.1.1 - Promote additional training opportunities for firefighters.	Wildfire	County, Tfalls, Plains, Hot Springs	High / 12	High
		1.1.2 - Encourage local fire depts./districts to assess and purchase necessary equipment through available grants.	Wildfire	County, Tfalls, Plains, Hot Springs	High / 11	High
		1.1.3 - Assist fire departments/districts in identifying grant opportunities and assist them in grant writing.	Wildfire	County, Tfalls, Plains, Hot Springs	High / 12	Medium
	Objective 1.2 - Implement Property Protection Projects to Reduce Impacts from Wildfire	1.2.1 - Upgrade the water supply in communities as needed to more effectively assist with wildfire suppression.	Wildfire	County, Tfalls, Plains, Hot Springs	Medium / 9	High
		1.2.2 - Support efforts by USFS to perform fuel mitigation on federal lands adjacent to the WUI.	Wildfire	County, Tfalls, Plains, Hot Springs	High / 10	High
		1.2.3 - Continue to fund landowner fuel reduction grants program.	Wildfire	County	High / 10	High
	Objective 1.3 - Implement Structural Projects to Reduce Impacts from Wildfire	1.3.1 - Improve existing access routes for evacuation and firefighter safety (i.e. Cherry Creek Road, River Road West, and others).	Wildfire	County	Medium / 8	Medium
	Objective 1.4 - Implement Public Education and Awareness Projects to Reduce Impacts from Wildfire	1.4.1 - Provide outreach to citizens on wildfire mitigation techniques.	Wildfire	County, Tfalls, Plains, Hot Springs	High / 11	High
		1.4.2 - Ensure timeliness of smoke messaging to protect vulnerable populations.	Wildfire	County, Tfalls, Plains, Hot Springs	Medium / 9	High
		1.4.3 - Maintain Sanders County Wildland Fire Information Facebook page.	Wildfire	County, Tfalls, Plains, Hot Springs	High / 12	High
	Objective 1.5 - Implement Planning, Mapping, and/or Analysis Projects to Reduce Impacts from Wildfire	1.5.1 - Update Community Wildfire Protection Plan.	Wildfire	County	High / 11	High
		1.5.2 - Develop database to track landowner assessments and fuel reduction accomplishments.	Wildfire	County	High / 10	High
		1.5.3 - Develop database with mapping of water supplies and access points to share amongst first responders.	Wildfire	County	High / 11	High
	Objective 1.6 - Implement Prevention Projects to Reduce Impacts from Wildfire	1.6.1 - Continue to update subdivision regulations with requirements that reduce wildfire losses.	Wildfire	County	High / 10	High
Goal 2 - Reduce Impacts from Haz-Mat Incidents and Transportation Accidents	Objective 2.1 - Enhance Emergency Service Capabilities to Reduce Impacts from Haz-Mat Incidents and Transportation Accidents	2.1.1 - Encourage local emergency responders to have adequate training to respond to hazardous material events consistent with local capabilities.	Haz-Mat Incidents/ Transportation Accidents	County, Tfalls, Plains, Hot Springs	Medium / 9	High
	Objective 2.2 - Implement Public Education and Awareness Projects to Reduce Impacts from Haz-Mat Incidents and Transportation Accidents	2.2.1 - Increase awareness of first responders and medical community on common hazardous materials either stored, used or transported through the area.	Haz-Mat Incidents/ Transp. Accidents	County, Tfalls, Plains, Hot Springs	Medium / 8	Medium
		2.2.2 - Conduct ongoing awareness training to schools on haz-mat exposure and shelter in place.	Haz-Mat Incidents/ Transp. Accidents	County, Tfalls, Plains, Hot Springs	Medium / 9	Medium

Table 5.5-2. Sanders County 2019 Mitigation Strategy

Goal	Objective	Project	Hazard	Jurisdiction	Benefit-Cost Ranking/Score	County Priority
Goal 3 - Reduce Impacts from Severe Weather and Drought	Objective 3.1 - Implement Public Education and Awareness Projects to Reduce Impacts from Severe Weather and Drought	3.1.1 - Support drought programs implemented through the Conservation District, NWS, DNRC, FSA, NRCS, NWS, and MSU Extension.	Drought	County, Tfalls, Plains, Hot Springs	Medium / 9	High
		3.1.2 - Continue to make available educational material on winter weather survival.	Severe Weather	County, Tfalls, Plains, Hot Springs	High / 10	High
		3.1.3 - Promote the National Weather Service's messaging on severe weather preparedness.	Severe Weather	County, Tfalls, Plains, Hot Springs	High / 11	High
		3.1.4 - Partner with the National Weather Service on the Weather Ready Nation Ambassador Program and increase participation in program.	Severe Weather	County, Tfalls, Plains, Hot Springs	High / 10	High
	Objective 3.2- Enhance Emergency Services Capabilities to Reduce Impacts from Severe Weather and Drought	3.2.1 - Continue coordinated management for de-icing roads, plowing snow, clearing roads of fallen trees, and clearing debris from public property.	Severe Weather	County, Tfalls, Plains, Hot Springs	High / 11	High
	Objective 3.3 - Implement Planning, Mapping and Analysis Projects to Reduce Impacts from Severe Weather and Drought	3.3.1 - Supports Sanders County Drought Committee and their recommendations.	Drought	County, Tfalls, Plains, Hot Springs	High / 10	High
Goal 4 - Reduce Impacts from Flooding	Objective 4.1 - Implement Structural Projects to Reduce Impacts from Flooding	4.1.1 -Continue to resize and upgrade culverts and bridges and elevate roadways in various locations to improve conveyance of flood waters.	Flooding	County, Tfalls, Plains, Hot Springs	High / 10	High
		4.1.2 - Maintain and improve the existing stormwater infrastructure to reduce impacts from flooding.	Flooding	Tfalls, Plains, Hot Springs	High / 10	High
	Objective 4.2 - Implement Public Education and Awareness Projects to Reduce Impacts from Flooding	4.2.1 - Educate homeowners on purchasing flood insurance through the National Flood Insurance Program.	Flooding	County, Plains, Hot Springs	High / 10	Medium
		4.2.2 - Coordinate with the National Weather Service on flood preparedness and disseminate information to public.	Flooding	County, Tfalls, Plains, Hot Springs	High / 10	High
		4.2.3 - Support NRCS committee that's looking at flood mitigation projects and completion of Phase I Treatment Plan for the Plains Reach of the Clark Fork River from Henry to Lynch Creeks.	Flooding	County, Plains	Medium / 9	High
	Objective 4.3 - Implement Property Protection Projects to Reduce Impacts from Flooding	4.3.1 - Work towards certifying the levee on the Garrison property with the USACE.	Flooding	County	Medium / 7	Medium

Table 5.5-2. Sanders County 2019 Mitigation Strategy

Goal	Objective	Project	Hazard	Jurisdiction	Benefit-Cost Ranking/Score	County Priority
Goal 5 - Reduce Impacts from Terrorism, Violence, Civil Unrest & Cyber Security	Objective 5.1 - Enhance Emergency Services Capabilities to Reduce Impacts from Terrorism, Violence, Civil Unrest, and Cyber Security	5.1.1 - Continue awareness and training on active shooters	Terrorism, Violence, Civil Unrest	County, Tfalls, Plains, Hot Springs	High / 10	High
		5.1.2 - Review Crisis Action Plans in all schools and hospitals to ensure they include adequate security measures.	Terrorism, Violence, Civil Unrest	County, Tfalls, Plains, Hot Springs	Medium / 9	High
		5.1.3 - Continue awareness training with county-city staff on cyber security	Cyber Security	County, Tfalls, Plains, Hot Springs	High / 10	High
	Objective 5.2 - Implement Structural Projects to Reduce Impacts from Terrorism, Violence, Civil Unrest, and Cyber Security	5.2.1 - Consider physical hardening of critical facilities (i.e. anti-vehicle barricades / interior barricades for locking doors [door kicks, door stops] / perimeter fencing / controlled access gates).	Terrorism, Violence, Civil Unrest	County, Tfalls, Plains, Hot Springs	Medium / 8	High
		5.2.2 - Continue to implement recommendations from cyber vulnerability assessments.	Cyber Security	County, Tfalls, Plains, Hot Springs	Medium / 8	High
	Objective 5.3 - Implement Public Education and Awareness Projects to Reduce Impacts from Terrorism, Violence, Civil Unrest, and Cyber Security	5.3.1 - Provide outreach to senior citizens on cyber security.	Cyber Security	County, Tfalls, Plains, Hot Springs	Medium / 9	High
Goal 6 - Reduce Impacts from Communicable Disease	Objective 6.1 - Implement Prevention Projects to Reduce Impacts from Communicable Disease	6.1.1 - Continue to prevent and control communicable disease by surveillance.	Communicable Disease	County, Tfalls, Plains, Hot Springs	High / 10	High
		6.1.2 - Continue to prevent and control communicable disease by activities to raise and sustain vaccine coverage in all populations.	Communicable Disease	County, Tfalls, Plains, Hot Springs	High / 10	High
		6.1.3 - Continue to conduct risk-based inspections of all food service establishments.	Communicable Disease	County, Tfalls, Plains, Hot Springs	High / 10	High
	Objective 6.2 - Implement Public Education and Awareness Projects to Reduce Impacts from Communicable Disease	6.2.1 - Continue to promote public education on preventing communicable disease.	Communicable Disease	County, Tfalls, Plains, Hot Springs	High / 10	High
Goal 7 - Reduce Impacts from Landslides	Objective 7.1 - Implement Property Protection Projects to Reduce Impacts from Landslides	7.1.1 - Continue to identify and document landslide-prone areas.	Landslide	County	High / 10	Medium
		7.1.2 -Support continued preservation and stabilization of slide-prone areas impacting roads.	Landslide	County	Medium / 9	High
Goal 8 - Reduce Impacts from Dam Failure	Objective 8.1 - Provide Public Education and Awareness to Reduce Impacts from Dam Failure	8.1.1 - Promote the benefit of using mass notification to alert downstream residents of dam failure hazards.	Dam Failure	County, Tfalls, Plains, Hot Springs	High / 10	Medium
		8.1.2 - Provide outreach to residents on siren warning system for dam failure.	Dam Failure	County	Medium / 9	High
	Objective 8.2 - Enhance Emergency Response Capabilities to Reduce Impacts from Dam Failure	8.2.1 - Continue to participate in exercises with dam owners.	Dam Failure	County, Tfalls, Plains, Hot Springs	High / 10	High

Table 5.5-2. Sanders County 2019 Mitigation Strategy

Goal	Objective	Project	Hazard	Jurisdiction	Benefit-Cost Ranking/Score	County Priority
Goal 9 - Reduce Impacts from All Hazards	Objective 9.1 - Enhance Emergency Service Capabilities to Reduce Impacts from All Hazards	9.1.1 - Continue to recruit and provide training to first responders and EMS volunteers.	All Hazards	County, Tfalls, Plains, Hot Springs	High / 10	High
		9.1.2 - Coordinate emergency response activities between railroad, Tribes, counties, municipalities, and state and federal agencies.	All Hazards	County, Tfalls, Plains, Hot Springs	High / 10	High
		9.1.3 - Obtain generators and install generator hookups at critical facilities and shelters, as needed.	All Hazards	County, Tfalls, Plains, Hot Springs	Medium / 8	High
		9.1.4 - Update communication equipment, as appropriate	All Hazards	County, Tfalls, Plains, Hot Springs	Medium / 9	High
		9.1.5 - Identify location for new dispatch center.	All Hazards	County, Tfalls, Plains, Hot Springs	High / 10	High
		9.1.6 - Identify emergency fuel supply and equip with generator.	All Hazards	County, Tfalls, Plains, Hot Springs	Medium / 9	High
	Objective 9.2- Provide Public Education and Awareness to Reduce Impacts from All Hazards	9.2.1 - Provide awareness on developing a family disaster plan and disaster supply kit.	All Hazards	County, Tfalls, Plains, Hot Springs	High / 10	High
		9.2.2 - Promote registration of cell phones for County's Emergency Notification System.	All Hazards	County, Tfalls, Plains, Hot Springs	High / 10	High
		9.2.3 - Obtain electric signs that can be used for various emergency related situations.	All Hazards	County, Tfalls, Plains, Hot Springs	Medium / 9	High

Notes: EMS = Emergency Medical Services; FSA = Farm Service Agency; MSU = Montana State University; NRCS = Natural Resources Conservation Service; NWS = National Weather Service; Tfalls = Thompson Falls; USACE = United States Army Corps. of Engineers.

Table 5.5-3. Sanders County 2019 Mitigation Strategy – Implementation Details

Project	Jurisdiction	Responsible Agency / Department	Progress Made	Planned Activities	Schedule	Potential Funding Source
WILDFIRE MITIGATION PROJECTS						
1.1.1 - Promote additional training opportunities for firefighters.	County, Tfalls, Plains, Hot Springs	OEM, Individual Fire Chiefs, Fire Association	DNRC has firefighter 1 course. Basic and refresher classes are offered annually.	Continue same.	Ongoing	County resources, DNRC, Fire Service Training School
1.1.2 - Encourage local fire depts./districts to assess and purchase necessary equipment through available grants.	County, Tfalls, Plains, Hot Springs	OEM, Individual Fire Chiefs, Fire Association	VFA grants have been secured annually and funded purchase of turnouts and radios. Plains-Paradise Fire District received AFG which funded acquisition of larger equipment.	Continue same. Update equipment as needed.	Ongoing	County resources, Grants
1.1.3 - Assist fire departments/districts in identifying grant opportunities and assist them in grant writing.	County, Tfalls, Plains, Hot Springs	OEM, DNRC	County OEM office passes on grant opportunities to local fire depts. DNRC has helped with grants.	Continue same.	Ongoing	Individual Rural Fire Districts/City Depts., Volunteers
1.2.1 - Upgrade the water supply in communities as needed to more effectively assist with wildfire suppression.	County, Tfalls, Plains, Hot Springs	County, Community Water Boards	TFalls has upgraded main water distribution lines. Engineering firm hired to assess Heron water system upgrade. Storage tanks have been put in in various locations.	Evaluate older subdivisions and determine where new water supplies are needed.	Ongoing	Grants, User Fees
1.2.2 - Support efforts by USFS to perform fuel mitigation on federal lands adjacent to the WUI.	County, Tfalls, Plains, Hot Springs	Commissioners, Sanders Co., Collaborative Wildfire Group	USFS completed fuel reduction on Little Beaver Creek drainage (LNF/KNF), Swamp Creek (LNF) and Trout Creek, Minton Peak (KNF).	Sanders County Collaborative Wildfire Group will continue to work with USFS to identify at-risk areas.	Ongoing	County resources
1.2.3 - Continue to fund landowner fuel reduction grants program.	County	OEM	New project for 2019 plan.	Seek continued Title III funding for FireWise Fuel Reduction Program administered by OEM office offering 90/10 match.	Ongoing	County resources, Title III Grant
1.3.1 - Improve existing access routes for evacuation and firefighter safety (i.e. Cherry Creek Road, River Road West, and others).	County	County Road Dept.	Paving done on Cherry Creek Road, River Road (Swamp Creek) widened and curves straightened.	Continue same.	Ongoing	County resources
1.4.1 - Provide outreach to citizens on wildfire mitigation techniques.	County, Tfalls, Plains, Hot Springs	OEM, Fire Council, DNRC	County has placed ads in newspaper to promote FireWise program. County and DNRC website updated during fire season.	Continue same.	Ongoing	County, DNRC, USFS, FireSafe Montana

Table 5.5-3. Sanders County 2019 Mitigation Strategy – Implementation Details

Project	Jurisdiction	Responsible Agency / Department	Progress Made	Planned Activities	Schedule	Potential Funding Source
1.4.2 - Ensure timeliness of smoke messaging to protect vulnerable populations.	County, Tfalls, Plains, Hot Springs	OEM, Schools, Medical Facilities	New project for 2019 plan.	Include DEQ air monitoring website in current messaging. Ensure schools and medical facilities are informed of current conditions.	Ongoing	County resources, DEQ
1.4.3 - Maintain Sanders County Wildland Fire Information Facebook page.	County, Tfalls, Plains, Hot Springs	OEM, Sanders Co. Collaborative Wildfire Group	New project for 2019 plan.	Ensure frequent posts are made during fire season and advertise for increased following.	Ongoing	County resources
1.5.1 - Update Community Wildfire Protection Plan.	County	Planning Dept. OEM	New project for 2019 plan.	Complete water supply inventory and include in updated CWPP.	Ongoing	County resources, MT DES, DNRC
1.5.2 - Develop database to track landowner assessments and fuel reduction accomplishments.	County	OEM, GIS	New project for 2019 plan.	Identify data fields needed to support future grants. Review data from past projects and enter into electronic format. 138 contracts have been issued thus far.	Short term	County resources
1.5.3 - Develop database with mapping of water supplies and access points to share amongst first responders.	County	Fire Districts, Planning, GIS	New project for 2019 plan.	Collect data and enter into database so firefighters know where water storage tanks are located. Data on access points will complement enhanced 911 and should be shared with first responders.	Short term	County resources
1.6.1 - Continue to update subdivision regulations with requirements that reduce wildfire losses.	County	Planning Dept.	New project for 2019 plan.	Stay abreast of additions to model subdivision regulations and incorporate as needed on local level.	Ongoing	County resources
HAZ-MAT INCIDENT & TRANSPORTATION ACCIDENT MITIGATION PROJECTS						
2.1.1 - Encourage local emergency responders to have adequate training to respond to hazardous material events consistent with local capabilities.	County, Tfalls, Plains, Hot Springs	Rural Fire Districts, City Fire Depts., OEM	MRL has done outreach to fire depts. in Tfalls and Heron.	Continue same.	Ongoing	County, City, Grants
2.2.1 - Increase awareness of first responders and medical community on common hazardous materials either stored, used or transported through the area.	County, Tfalls, Plains, Hot Springs	LEPC, P66, MRL, Hospital, Salish-Kootenai College	New project for 2019 plan.	Invite first responders and medical professionals to participate in LEPC. Provide annual training using emergency response guide.	Ongoing	County resources, MRL, P66, Hospital
2.2.2 - Conduct ongoing awareness training to schools on haz-mat exposure and shelter in place.	County, Tfalls, Plains, Hot Springs	LEPC, P66, MRL, Schools	No progress to report.	Develop training module and provide to schools annually. Assist school's in exercising their emergency response plans and encourage practice similar to fire drills.	Ongoing	P66, MRL, other transporters, Schools

Table 5.5-3. Sanders County 2019 Mitigation Strategy – Implementation Details

Project	Jurisdiction	Responsible Agency / Department	Progress Made	Planned Activities	Schedule	Potential Funding Source
SEVERE WEATHER & DROUGHT MITIGATION PROJECTS						
3.1.1 - Support drought programs implemented through the Conservation District, NWS, DNRC, FSA, NRCS, and MSU Extension.	County, Tfalls, Plains, Hot Springs	County Extension Agent, Drought Committee, Hot Springs Town Council	Drought info is provided via agency websites, and networking with farmers. Supplemental feed and funding for grasshopper spraying has been provided. County drought committee advises municipalities when mandatory conservation measures are in order.	Continue same	Ongoing	County resources, Federal agencies
3.1.2 - Continue to make available educational material on winter weather survival.	County, Tfalls, Plains, Hot Springs	DES, NWS	DES provides brochures published by MDT. Distributed in public places.	Continue same. MDT websites and NWS alerts provide this information. Disseminate through social media.	Ongoing	County, State DES, MDT
3.1.3 - Promote the National Weather Service's messaging on severe weather preparedness.	County, Tfalls, Plains, Hot Springs	DES, NWS	NWS jumps on preparedness campaigns when bad patterns shaping up through social media. Changed approach from seasonal "Awareness" week because couldn't determine effectiveness.	County will share message from NWS via social media.	Ongoing	County resources, NWS
3.1.4 - Partner with the National Weather Service on the Weather Ready Nation Ambassador Program and increase participation in program.	County, Tfalls, Plains, Hot Springs	LEPC, DES	New project for 2019 Plan.	Push info out on social media to get organizations involved.	Ongoing	County resources
3.2.1 - Continue coordinated management for de-icing roads, plowing snow, clearing roads of fallen trees, and clearing debris from public property.	County, Tfalls, Plains, Hot Springs	City/Town Public Works, County Road Dept.	County, CSKT, MDT, and municipalities each have own road assignments that they take care of.	Continue same.	Ongoing	City/Towns, County
3.3.1 - Supports Sanders County Drought Committee and their recommendations.	County, Tfalls, Plains, Hot Springs	County Extension Agent, Commissioners, NWS, DNRC, FSA, NRCS	New project for 2019 Plan.	Drought committee made up of regional partners. Recommends irrigation efficiencies. Will advise municipalities when mandatory conservation is needed. NWS hydrologist advises on regional drought conditions.	Ongoing	County resources, State and federal partners
FLOODING MITIGATION PROJECTS						
4.1.1 -Continue to resize and upgrade culverts and bridges and elevate roadways in various locations to improve conveyance of flood waters.	County, Tfalls, Plains, Hot Springs	County Road Dept., City/Town Public Works Depts.	Several culvert upgrades were completed at Thompson River and in the Hot Springs area.	Plains looking at additional stormwater projects.	Ongoing	County and City/Town resources, FEMA

Table 5.5-3. Sanders County 2019 Mitigation Strategy – Implementation Details

Project	Jurisdiction	Responsible Agency / Department	Progress Made	Planned Activities	Schedule	Potential Funding Source
4.1.2 - Maintain and improve the existing stormwater infrastructure to reduce impacts from flooding.	Tfalls, Plains, Hot Springs	City/Town Public Works Depts.	New project for 2019 Plan. Town of Plains completed stormwater projects on a couple of streets. Hot Springs replaced several storm drains.	Plains and Hot Springs looking at additional stormwater projects.	Ongoing	City/Town resources, CDBG, other grants
4.2.1 - Educate homeowners on purchasing flood insurance through the National Flood Insurance Program.	County, Plains, Hot Springs	Floodplain Administrators	Continue same.	Floodplain Administrators	Ongoing	County and City/Town resources, FEMA
4.2.2 - Coordinate with the National Weather Service on flood preparedness and disseminate information to public.	County, Tfalls, Plains, Hot Springs	NWS, DES	Continue same.	NWS, DES	Ongoing	County resources, NWS
4.2.3 - Support NRCS committee that's looking at flood mitigation projects and completion of Phase I Treatment Plan for the Plains Reach of the Clark Fork River from Henry to Lynch Creeks.	County, Plains	County, Town of Plains, Landowners, NRCS	Project has stalled. Initiate additional phases of project for construction.	County, Town of Plains, Landowners, NRCS	Long-term	NRCS
4.3.1 - Work towards certifying the levee on the Garrison property with the USACE.	County	County, USACE	New project for 2019 Plan.	Perform engineering and levee upgrades as needed. Schedule USACE compliance inspection when ready.	Mid-term	County resources
TERRORISM/VIOLENCE/CIVIL UNREST/CYBER SECURITY MITIGATION PROJECTS						
5.1.1 - Continue awareness and training on active shooters	County, Tfalls, Plains, Hot Springs	DES, Law Enforcement, Schools	New project for 2019 Plan.	Utilize trainers at DES and Sheriff's office to provide training to schools and others county-wide.	Ongoing	County resources, Schools
5.1.2 - Review Crisis Action Plans in all schools and hospitals to ensure they include adequate security measures.	County, Tfalls, Plains, Hot Springs	DES, Schools, Hospital	New project for 2019 Plan.	DES to initiate annual review and provide recommendations for update. Encourage exercises.	Ongoing	County resources, Schools, Hospital
5.1.3 - Continue awareness training with county-city staff on cyber security	County, Tfalls, Plains, Hot Springs	County IT Dept., City/Town IT Depts.	New project for 2019 Plan.	Develop training schedule and expand to cities and towns. Promote cyber security through ongoing messaging. Update employee handbooks annually.	Ongoing	County resources
5.2.1 - Consider physical hardening of critical facilities (i.e. anti-vehicle barricades / interior barricades for locking doors [door kicks, door stops] / perimeter fencing / controlled access gates).	County, Tfalls, Plains, Hot Springs	DES, Schools	New project for 2019 Plan.	Utilize DHS and additional resources to perform assessments on schools and critical facilities. Determine if grants are available to fund improvements.	Mid-term	County and City/Town resources, Grants

Table 5.5-3. Sanders County 2019 Mitigation Strategy – Implementation Details

Project	Jurisdiction	Responsible Agency / Department	Progress Made	Planned Activities	Schedule	Potential Funding Source
5.2.2 - Continue to implement recommendations from cyber vulnerability assessments.	County, Tfalls, Plains, Hot Springs	County IT Dept.	New project for 2019 Plan.	Continue assessments of critical cyber infrastructure including fire walls and networks. Perform system analysis on regular basis. Update equipment as needed.	Ongoing	County resources
COMMUNICABLE DISEASE MITIGATION PROJECTS						
6.1.1 - Continue to prevent and control communicable disease by surveillance.	County, Tfalls, Plains, Hot Springs	County Public Health	New project for 2019 Plan	Continue to utilize DPHHS MT-IBIS database.	Ongoing	County resources, DPHHS
6.1.2 - Continue to prevent and control communicable disease by activities to raise and sustain vaccine coverage in all populations.	County, Tfalls, Plains, Hot Springs	County Public Health	New project for 2019 Plan	Continue to conduct vaccination clinics. Utilize print, broadcast, and social media to promote.	Ongoing	County resources, DPHHS
6.1.3 - Continue to conduct risk-based inspections of all food service establishments.	County, Tfalls, Plains, Hot Springs	County Environmental Health	New project for 2019 Plan	Continue to do risk-based inspections at licensed establishments and event vendors.	Ongoing	County resources, DPHHS
6.2.1 - Continue to promote public education on preventing communicable disease.	County, Tfalls, Plains, Hot Springs	County Public Health	New project for 2019 Plan	Continue to utilize Health Alert Network to communicate internally. Send alerts to physicians. Utilize State's 406 Weekly public health messages, as appropriate.	Ongoing	County resources, DPHHS
LANDSLIDE MITIGATION PROJECTS						
7.1.1 - Continue to identify and document landslide-prone areas.	County	County Road Dept., MDT, USFS	Several landslide-prone areas identified including near Heron and between Plains and Tfalls	Continue same.	Ongoing	County, State, Federal resources
7.1.2 -Support continued preservation and stabilization of slide-prone areas impacting roads.	County	MDT, USFS, County Road Dept.	As needed, responsible entity repairs roads where slides have impacted roadways.	Continue same.	Ongoing	County, State, Federal resources
DAM FAILURE MITIGATION PROJECTS						
8.1.1 - Promote the benefit of using mass notification to alert downstream residents of dam failure hazards.	County, Tfalls, Plains, Hot Springs	OEM	County uses Hyper-Reach as emergency notification system. NOAA weather radios not primary source of notification.	Utilized print and social media to inform residents on how they will receive notification of pending dam failure.	Ongoing	County resources
8.1.2 - Provide outreach to residents on siren warning system for dam failure.	County	OEM, AVISTA	Siren tests at Noxon dam monthly. Articles on sirens in newspaper periodically.	Continue same.	Ongoing	County resources, AVISTA
8.2.1 - Continue to participate in exercises with dam owners.	County, Tfalls, Plains, Hot Springs	OEM	New project.	Increase participation of first responders in dam failure exercises.	Ongoing	County resources

Table 5.5-3. Sanders County 2019 Mitigation Strategy – Implementation Details

Project	Jurisdiction	Responsible Agency / Department	Progress Made	Planned Activities	Schedule	Potential Funding Source
ALL HAZARD MITIGATION PROJECTS						
9.1.1 - Continue to recruit and provide training to first responders and EMS volunteers.	County, Tfalls, Plains, Hot Springs	OEM, Individual Fire and Ambulance Districts	Have utilized newspapers and word of mouth for recruitment. Have provided ICS training to EMS and refresher training annually.	Continue same. Train everyone to basic level and refresh annually.	Ongoing	County resources
9.1.2 - Coordinate emergency response activities between railroad, Tribes, counties, municipalities, and state and federal agencies.	County, Tfalls, Plains, Hot Springs	OEM, LEPC	LEPC meetings are utilized for this purpose. Railroad has supplied some of training.	Continue same. Encourage all stakeholders to participate. Keep LEPC list current.	Ongoing	County resources
9.1.3 - Obtain generators and install generator hookups at critical facilities and shelters, as needed.	County, Tfalls, Plains, Hot Springs	OEM, LEPC	Needs have been identified. Funding is largest obstacle to project implementation.	Identify and secure funding for mobile generators. Install pre-wiring hookups as needed in critical facilities and shelters.	Ongoing	County, City/Town resources
9.1.4 - Update communication equipment, as appropriate	County, Tfalls, Plains, Hot Springs	OEM	New project for 2019 Plan.	Identify and prioritize needs. Identify and secure funding.	Ongoing	County resources, grants
9.1.5 - Identify location for new dispatch center.	County, Tfalls, Plains, Hot Springs	OEM, Commissioners	New project for 2019 Plan.	Identify possible locations and perform feasibility study to arrive at best alternative. Secure funding to implement move.	Short-term	County resources, grants
9.1.6 - Identify emergency fuel supply and equip with generator.	County, Tfalls, Plains, Hot Springs	OEM	Coordinate with Phillips 66 for emergency access to fuel tank. Develop agreements.	OEM	Mid-term	County resources, grants
9.2.1 - Provide awareness on developing a family disaster plan and disaster supply kit.	County, Tfalls, Plains, Hot Springs	OEM, LEPC, Chamber of Commerce	Has been promoted at community events including health fairs. Chamber of Commerce distributes flyers.	Continue. Expand to schools.		
9.2.2 - Promote registration of cell phones for County's Emergency Notification System.	County, Tfalls, Plains, Hot Springs	OEM, Dispatch	Initial enrollment took place when Hyper-Reach rolled out.	Utilize print, broadcast, and social media to encourage residents to enroll phones.	Ongoing	County resources
9.2.3 - Obtain electric signs that can be used for various emergency related situations.	County, Tfalls, Plains, Hot Springs	OEM	New project for 2019 Plan.	Identify and secure funding for purchase.	Ongoing	County resources

Notes: AFG = Assistance to Firefighter Grant; CDBG = Community Development Block Grant; CSKT = Confederated Salish and Kootenai Tribe; CWPP = Community Wildfire Protection Plan; DES = Disaster and Emergency Services; DEQ = Montana Dept. of Environmental Quality; DHS = U.S. Dept. of Homeland Security; DNRC = Montana Dept. of Natural Resources and Conservation; DPHHS = Department of Public Health and Human Services; EMS = Emergency Medical Services; FSA = Farm Service Agency; GIS = Geographic Information System; ICS = Incident Command System; IT = Information Technology; KNF = Kootenai National Forest; LEPC = Local Emergency Planning Committee; LNF = Lolo National Forest; MDT = Montana Dept. of Transportation; MRL = Montana Rail Link; MSU = Montana State University; NOAA = National Oceanic and Atmospheric Administration; NRCS = Natural Resources Conservation Service; NWS = National Weather Service; OEM = Office of Emergency Management; P66 = Phillips 66; Tfalls = Thompson Falls; USACE = United Stated Army Corps of Engineers; USFS = United States Forest Service; VFA = Volunteer Fire Assistance; WUI = Wildland Urban Interface

SECTION 6. PLAN MAINTENANCE PROCEDURES

The plan maintenance section details the formal process that will ensure that the Sanders County MHMP remains an active and relevant document. The maintenance process includes a schedule for monitoring and evaluating the plan and producing a plan revision every five years. The plan can be revised more frequently than five years if the conditions under which it was developed change significantly (e.g. a major disaster occurs, and projects are accomplished, and/or new projects need to be identified, or funding availability changes). This section also describes how Sanders County will monitor the progress of mitigation activities and how they will be incorporated into existing planning mechanisms. The final section describes how the Sanders County will integrate public participation throughout the plan maintenance process.

6.1 Monitoring, Evaluating and Updating the Plan

Evaluation of the mitigation plan consists of an assessment of whether the planning process and actions have been effective and whether changes are needed. The review should determine whether the hazards profiled remain relevant and what new or emerging hazards may affect the area, whether capabilities have changed to support mitigation, and whether the Plan goals are being reached. Plan updates typically occur every five years but can take place more frequently, if needed.

6.1.1 2012 PDM Plan

The 2012 PDM Plan was monitored and evaluated several times since it was updated in 2012. Plan evaluation was not put on the LEPC schedule for review at regular intervals; however, the hazard profiles and mitigation projects were reviewed after hazard events or when projects come up.

6.1.2 2019 MHMP

The updated MHMP should be reviewed at meetings of the LEPC. The LEPC membership includes many of the MHMP Planning Team members who will bring insight to the group on plan development. A different hazard profile should be reviewed quarterly by the LEPC and/or seasonably, to coincide with hazard events. The plan review should consider any new hazards and vulnerabilities as well as document completed mitigation projects, identify new mitigation projects and evaluate mitigation priorities. The review should determine whether a plan update is needed prior to the required five-year update.

The Sanders County OEM director will be responsible for ensuring the MHMP review is on the agenda at the LEPC meetings so that applicability of the plan can be evaluated. The OEM director should prepare a status report summarizing the outcome of the plan review and the minutes should be made available to interested stakeholders and kept in a permanent file designated for the next (2024) MHMP update.

The MHMP will also be evaluated and revised following any major disasters, to determine if the recommended actions remain relevant and appropriate. The risk assessment will also be revisited to see if any changes are necessary based on the pattern of disaster damages. This is an opportunity to increase the community's disaster resistance and build a better and stronger community.

Three years after adoption of the MHMP, Sanders County OEM may decide to apply for a planning grant through FEMA to start the 2024 MHMP update. Upon receipt of funding, the County will solicit bids in accordance with applicable contracting procedures and hire a contractor to assist with the project. The proposed schedule for completion of the plan update is one year from award of a contract, to coincide with the five-year adoption date of the 2019 MHMP Update.

The Sanders County OEM director will be responsible for the plan update. Before the end of the five-year period, the updated plan will be submitted to FEMA for approval. When concurrence is received that the updated plan complies with FEMA requirements, it will be submitted to the Sanders County Board of Commissioners, and the Thompson Falls, Plains, and Hot Springs City/Town Councils for adoption. The OEM director will send an e-mail to individuals and organizations on the stakeholder list to inform them that the updated plan is available on the County website.

6.2 Monitoring Progress of Mitigation Activities

The process for monitoring and evaluating mitigation projects is the responsibility of the LEPC, an organization comprised of local officials from Sanders County, Thompson Falls, Plains, and Hot Springs, emergency response entities, local businesses, and non-profit organizations who meet on a regular basis.

6.2.1 2012 PDM Plan

Since development of the 2012 PDM Plan, several mitigation projects were completed in Sanders County (see *Section 5.1*), while a number of other projects are on-going and will continue through the next planning period. The LEPC discusses hazard mitigation, as needed, and prioritizes projects based on the funding that is available and severity of hazard events that have occurred in the county.

Sanders County OEM has monitored completion of most mitigation projects; however, the 2012 PDM Plan did not outline a specific process to track the initiation, status, and completion of mitigation activities. Each department monitors completion of mitigation projects under their purview: i.e., the Sanders County OEM Director and Collaborative Wildfire Group monitors wildfire projects; the County Road & Bridge and City/Town Public Works departments monitor culvert and drainage projects within their jurisdiction; and, County OEM monitors severe weather projects.

6.2.2 2019 MHMP

Going forward, the LEPC will review the mitigation goals, objectives, and actions to ensure progress is being made. They will evaluate the feasibility of the mitigation projects, monitor resources, budgets, and schedules, and document project completion, at a minimum, on an annual basis. This group will provide a venue for reporting and accountability. Many of the MHMP Planning Team members responsible for the MHMP update are members of the Sanders County LEPC.

Mitigation project evaluations will assess whether:

- Goals and objectives address current and expected conditions.
- The nature or magnitude of the risks has changed.

- Current resources are appropriate for implementing the MHMP and if different or additional resources are now available.
- Actions were cost effective.
- Schedules and budgets are feasible.
- Implementation problems, such as technical, political, legal or coordination issues with other agencies are presents.
- Outcomes have occurred as expected.
- New agencies/departments/staff should be included.

Individual projects will be monitored by the department implementing the project or the grant. Generally, HMGP and PDMC projects will be monitored by Sanders County OEM and any National Fire Plan projects or will be monitored by Sanders County OEM, the U.S. Forest Service and/or DNRC. Each organization will track projects through a central database and issue quarterly reports to federal agencies. A mitigation action plan has been developed for each project (**Appendix D-3**). Each agency or department listed as a "responsible entity" should receive a copy of the mitigation action plan assigned to them and record progress and development towards project implementation.

The LEPC will continually observe the processes for implementation of the mitigation projects. Monitoring project implementation and evaluating effectiveness will enable the LEPC to determine if any changes are needed at the time of the next MHMP update. During the LEPC meetings where project status is reviewed, each agency/dept. will provide an update on projects under their purview and will communicate challenges, success and opportunities. Topics discussed will include:

- Any grant applications filed on behalf of any of the participating jurisdictions;
- Hazard events and losses occurring in their jurisdiction;
- Progress on the implementation of mitigation actions, including efforts to obtain outside funding;
- Obstacles or impediments to implementation of actions;
- Additional mitigation actions believed to be appropriate and feasible; and
- Public and stakeholder input.

Minutes should be prepared from these meetings and should be distributed to interested stakeholders as well as kept in a permanent file for the next MHMP update (2024).

Sanders County may want to consider measuring their mitigation success by participating in the STAR Community Rating System. Local leaders can use the STAR Community System to assess how sustainable they are, set goals for moving ahead and measure progress along the way. To get started, go to http://starcommunities.org/get-started.

6.3 Implementation through Existing Programs

Sanders County will have the opportunity to implement hazard mitigation projects through existing programs and procedures through plan revisions or amendments. The MHMP will be incorporated into the plans, regulations and ordinances as they are updated in the future or when new plans are developed. **Table 6.3-1** presents a summary of existing plans and ordinances and how integration of mitigation projects will occur.

Table 6.3-1. Implementation of Mitigation into Existing Plans and Codes

Type	Name	Integration Technique
Plans		
Emergency Operations	Sanders County Emergency Operations Plan	Integrated by reference in MHMP.
Growth Policies	Town of Plains Growth Policy	Integration of mitigation strategies will occur when growth policies are revised.
	Town of Hot Springs Growth Policy	
Wildfire Mitigation	Community Wildfire Protection Plan	Wildfire mitigation projects will be incorporated when plan is revised.
Flooding	Sanders County Flood Insurance Study	Integration of mitigation plan will occur, as appropriate, when study is revised.
Codes, Regulations & Ordinances		
Zoning	City of Thompson Falls Zoning Ordinance	Mitigation plan will be incorporated into revisions of zoning ordinances.
	Town of Plains Zoning Ordinance	
	Town of Hot Springs Zoning Ordinance	
Subdivisions	Sanders County Subdivision Regulations	Mitigation plan will be incorporated into revisions of subdivision regulations.
	City of Thompson Falls Subdivision Regulations	
	Town of Hot Springs Subdivision Regulations	
	Town of Hot Springs Subdivision Regulations	
Floodplain	Sanders County Floodplain Regulations	Mitigation plan will be incorporated into revisions of floodplain regulations.
	Town of Plains Floodplain Regulations	
	Town of Hot Springs Floodplain Regulations	

A summary of how the MHMP can be integrated into the legal framework includes:

- Partner with other organizations and agencies with similar goals to promote building codes that are more disaster resistant on the State level.
- Develop incentives for local governments, citizens, and businesses to pursue hazard mitigation projects.
- Allocate County resources and assistance for mitigation projects.
- Partner with other organizations and agencies in northwestern Montana to support hazard mitigation activities.

The Towns of Plains and Hot Spring use growth policies to guide development. Typically, a Growth Policy will address hazards; specifically, that life and property be protected from natural disasters and man-caused hazards. Mitigation goals in the MHMP will be recommended for incorporation into future revisions of these growth policies to ensure that high-hazard areas are being considered for low risk uses. If Sanders County and the City of Thompson Falls adopt a growth policy in the future, mitigation goals can be incorporated therein.

To ensure that the requirements of the MHMP are incorporated into other planning mechanisms and remain an on-going concern in Sanders County, job descriptions of various staff will be enhanced to include a mitigation component. The job descriptions of County Land Service Director and floodplain administrators will be augmented to include involvement in the LEPC. Participation in this group will provide an awareness of new and on-going mitigation initiatives for the purpose that they be integrated into plans, codes and regulations during revision. The job description of the OEM director will include responsibilities for implementing outreach activities for risk reduction in the county, coordinating with the Board of County Commissioners to secure funding for mitigation projects, ensure mitigation projects are implemented, and updating the MHMP. The OEM director will also be responsible for maintaining permanent master file for the MHMP planning process, which will

include damage figures from hazard events, records of mitigation projects, and notes/minutes from relevant meetings.

Meetings of the Board of County Commissioners will provide an opportunity for Sanders County OEM to report back on the progress made on the integration of mitigation planning elements into County and City/Town planning documents and procedures.

6.4 Continued Public Involvement

Sanders County is dedicated to involving the public directly in review and updates of the MHMP. The public will have many opportunities to provide feedback about the plan. Hard copies of the plan will be kept at appropriate County and City/Town offices. An electronic copy of the plan will be available on the Sanders County website. The existence and location of plan hard copies will be publicized on the County website. *Section 2.0* includes the address and the phone number of Sanders County OEM who will be responsible for keeping track of public comments on the plan.

The public will be invited to meetings of the LEPC when the MHMP is discussed. The meetings will provide the public a forum for which they can express concerns, opinions, or ideas about the plan. The OEM director will be responsible for using County resources to publicize the public meetings and maintain public involvement through the newspapers, radio and Internet.

The MHMP Planning Team will continually observe the processes for public outreach. By monitoring these activities, the Planning Team will then be able to evaluate them at the time of the plan update and determine if any changes are needed.

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