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I. INTRODUCTION

CHANGES/REVISIONS TO INTRODUCTION:

The Methodology, Authorities, References, Acronyms, and Definition of Terms were eliminated from the plan as all fell under one or more of the following categories: outdated, not required, lacked purpose, or covered or further explained in another section of the plan. Purpose, scope, and goals were added to the Introduction.

Additionally for organization purposes, the County Profile section was included in the Introduction rather than written as a separate Chapter of the plan. Minor changes were made to the County Profile as some elements such as population have changed since the 2008 draft was written.

INTRODUCTION

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

This plan identifies the region's hazards to further understand our vulnerabilities. This knowledge will help identify solutions that can significantly reduce threat to life and property. The plan is based on the premise that hazard mitigation works. With increased attention to mitigating natural hazards, communities can do much to reduce threats to existing citizens and avoid creating new problems in the future. In addition, many mitigation actions can be implemented at minimal cost.

This is not an emergency response or emergency management plan. Certainly, the plan can be used to identify weaknesses and refocus emergency response planning. Enhanced emergency response planning is an important mitigation strategy. However, the focus of this plan is to support better decision making directed toward avoidance of future risks and the implementation of activities or projects that will eliminate or reduce the risk for those that may already have exposure to a natural hazard threat.

PURPOSE OF THE PRE-DISASTER MITIGATION PLAN

In October of 2000, the Disaster Mitigation Act (DMA2K) was signed to amend the 1988 Robert T. Stafford Disaster Relief and Emergency Assistance Act. Section 322 of the Disaster Mitigation Act requires that local governments, as a condition of receiving federal disaster mitigation funds, have a pre-disaster mitigation (PDM) plan in place that:

1. Identifies hazards and their associated risks and vulnerabilities;
2. Develops and prioritizes mitigation projects; and
3. Encourages cooperation and communication between all levels of government and the public.

The purpose of this plan is to meet the hazard mitigation planning needs for Spink County and participating entities. Consistent with the Federal Emergency Management Agency's guidelines, this plan will review all possible activities related to disasters to reach efficient solutions, link hazard management policies to specific activities, educate and facilitate communication with the public, build public and political support for mitigation activities, and develop implementation and planning requirements for future hazard mitigation projects.

PURPOSE

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

PLAN USE

First, the plan should be used to help local elected and appointed officials plan, design and implement programs and projects that will help reduce their community's vulnerability to natural hazards. Second, the plan should be used to facilitate inter-jurisdictional coordination and collaboration related to natural hazard mitigation planning and implementation. Third, the plan should be used to develop or provide guidance for local emergency response planning. Finally, when adopted, the plan will bring communities in compliance with the Disaster Mitigation Act of 2000.

SCOPE

1. Provide opportunities for public input and encourage participation and involvement regarding the mitigation plan.
2. Identify hazards and vulnerabilities within the county and local jurisdictions.
3. Combine risk assessments with public and emergency management ideas.
4. Develop goals based on the identified hazards and risks.
5. Review existing mitigation measures for gaps and establish projects to sufficiently fulfill the goals.
6. Prioritize and evaluate each strategy/objective.
7. Review other plans for cohesion and incorporation with the PDM.
8. Establish guidelines for updating and monitoring the plan.
9. Present the plan to Spink County and the participating communities within the county for adoption.

LOCAL GOALS

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

- Protection of life before, during, and after the occurrence of a disaster;
- Protection of emergency response capabilities (critical infrastructure);
- Establish and maintain communication and warning systems;
- Protection of critical facilities;
- Government continuity;
- Protection of developed property, homes and businesses, industry, education opportunities and the cultural fabric of a community, by combining hazard loss reduction with the community's environmental, social, and economic needs; and
- Protection of natural resources and the environment, when considering mitigation measures.

LONG-TERM GOALS

- Eliminate or reduce the long-term risk to human life and property from identified natural and technologic hazards;
- Aid both the private and public sectors in understanding the risks they may be exposed to and finding mitigation strategies to reduce those risks;
- Avoid risk of exposure to identified hazards;
- Minimize the impacts of those risks when they cannot be avoided;
- Mitigate the impacts of damage as a result or identified hazards;
- Accomplish mitigation strategies in such a way that negative environmental impacts are minimized;
- Provide a basis for funding of projects outlined as hazard mitigation strategies; and
- Establish a regional platform to enable the community to take advantage of shared goals, resources, and the availability of outside resources.

WHAT IS HAZARD MITIGATION?

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

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

The primary focus of hazard mitigation actions must be at the point at which capital investment decisions are made and based on vulnerability. Capital investments, whether for homes, roads, public utilities, pipelines, power plants, or public works, determine to a large extent the nature and degree of hazard vulnerability of a community. Once a capital facility is in place, very few opportunities will present themselves over the useful life of the facility to correct any errors in location or

construction with respect to hazard vulnerability. It is for these reasons that zoning and other ordinances, which manage development in high vulnerability areas, and building codes, which insure that new buildings are built to withstand the damaging forces of hazards, are often the most useful mitigation approaches a city can implement.

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

This plan evaluates the impacts, risks and vulnerabilities of natural hazards within the jurisdictional area of the entire county. The plan supports, provides assistance, identifies and describes mitigation projects for each of the local jurisdictions who participated in the plan update. The suggested actions and plan implementation for local governments could reduce the impact of future natural hazard occurrences. Lessening the impact of natural hazards can prevent such occurrences from becoming disastrous, but will only be accomplished through coordinated partnership with emergency managers, political entities, public works officials, community planners and other dedicated individuals working to implement this program.

SPINK COUNTY PROFILE

GEOGRAPHIC BACKGROUND

The geographic area of Spink County is 1,504 square miles, with an elevation of 1,322 feet. The water area within the county is 6.2 square miles. Spink County is located near the North end of "Tornado Alley" (44º50'N, 98º25'W). The county is relatively flat with less than twelve feet of general elevation deviation, except for the James River Valley, which contributes to an area of lightly rolling hills. The James River zigzags through the county bisecting it North to South, it takes approximately 100 miles of river to cover the 50 miles of distance across the county, and is the destination for the entire run off water in the county. Areas along the river are subject to occasional flooding problems. There are additional water areas within the county that equal approximately 6.2 square miles. Soil types range from the rich deep river bottom lands along the river to the rolling high plain clay based soils in the western portions of the county. Land uses include heavy crop lands near the river and hay and pasture land to the west.

Because of its communities and early development around the railroads, major highways bisect the area. Highways 37 and 281 are major North-South routes through the county while Highways 212, 20, 26, and 28 are major East-West routes through the county. At this point in time, only one major railway is still in use in the county – the Burlington Northern Santa Fe Railroad (BNSF) which runs north-south through Tulare, Redfield, and Mellette. While Spink County is rural, high voltage electrical lines run through the county.

Location Maps of Spink County and its cities and towns have been included with the plan in Attachment A.

Spink County and participating entities maps have been included with the plan in Attachment A.

POPULATION DEMOGRAPHICS

According to the Census Bureau, in 2010 the County had a population of 6,415, a decline of 13.9 percent from the 2000 census. With only 6,415 people residing in 1,504 square miles translates to around 4.2 persons per square mile, classifying the county as mostly rural. Within Spink County lies one city, Redfield, which has a population of 2,333. Ten other incorporated communities lie within the County including: Ashton (pop. 122); Brentford (pop. 77); Conde (pop. 140); Doland (pop. 180); Frankfort (pop. 149); Hitchcock (pop. 91), Mellette (pop. 210); Northville (pop. 143); Tulare (pop. 207); and Turton (pop. 48). In addition, two unincorporated municipalities lie in Spink County: Athol (pop. 10)* and Mansfield (pop.60)*. Besides the communities, Spink County is comprised of 37 townships. According to the 2010 Census, the County is predominately white (97.1%) and has a nearly 1-1 male to female ratio. Most of the residents within the County fall into the low-moderate income category. Agriculture and the State Development Center are the major employers for the area.

**The Town of Hitchcock is located mainly in Beadle County (approximately 95%) and was included in the Beadle County Pre-Disaster Mitigation Plan.* The unincorporated areas of Athol and Mansfield do not have actual Census statistics because they are counted and included in the township numbers.

ECONOMIC PROFILE

The Spink County economy has historically been very reliant upon the farming industry. Although farming is still very important, the decline of the small family farm and the declining population in most of the Spink County communities has forged a significant decline in employment within the farm industry. Twenty percent, or 1,283 of the population is 65 years or older. The county seat is Redfield, situated at the intersection of US Highway 281 and US Highway 212. It has a population of 2,333, which makes up about 36 percent of the total population in Spink County. There are 2,608 occupied housing units located within the 1,504 square miles of land located in Spink County.

CLIMATE

Spink County is located in the James River Valley, known to have some of the largest temperature variances in the world, from a negative 50 degrees Fahrenheit in the winter to 120 degrees Fahrenheit above 0, in the summer. The annual precipitation average is 20 inches. The months with the most precipitation are March through early June and October.

TRANSPORTATION

Transportation planning for streets and roads begins with understanding the relationship between land use and road network. Streets and roads balance functions of mobility and land access. On one side, such as interstate highways, mobility is the primary function of the network. On the other side, such as local roads, land access to farms and residences is the primary service. In between these two extremes, mobility and land access varies depending on the function of the road network.

Functional classification is the process of grouping streets and roads into classes according to the function they are intended to provide. Listed below is Spink County's functional classification system. The classification is according to the rural systems classification as developed by the Federal Highway Administration.

1. Principal Arterials – serve longer strips of a statewide or interstate nature, carry the highest traffic volumes, connect larger urban areas, provide minimal land access, and include both interstate and non-interstate principal arterial highways.

2. Minor Arterials – interconnect the principal arterials, provide less mobility and slightly more land access, and distribute travel to smaller towns, and major resorts attracting longer trips.

3. Major Collectors – provide both land access and traffic circulation connecting county seats not served by arterials and connect intracounty traffic generators

like schools, shipping points, county parks, and important mining and agricultural areas.

4. Minor Collectors – collect traffic from local roads and bring all developed areas within a reasonable distance of a collector road.

5. Local Roads – provide direct access to adjacent land and to the highest classified roads and serve short trips.

A Major Street Plan includes a current and future hierarchy of street classifications for use in identifying and prioritizing transportation needs of Spink County.

NATIONAL FLOOD INSURANCE PROGRAM PARTICIPATION

Five jurisdictions located within Spink County participate in the National Flood Insurance Program (NFIP): Spink County, Ashton, Doland, Redfield and Tulare. The remaining towns currently do not participate in the NFIP: Brentford, Conde, Frankfort, Mellette, Northville, and Turton. Table 1.1 was taken from the 2008 PDM Plan. It lists population, latitude and longitude, elevation, and NFIP status of communities within the county. Population statistics were taken from Census 2010 and location and elevation were taken from Google Earth. NFIP status was provided by Spink County Emergency Mgt.

Table 1.1: Spink County Municipalities Overview

Name	Pop. (2010)	Location	Elevation	NFIP
Cities/Towns				
Redfield	2,333	44º 52’ 33.06” N 98º 31’ 07.41” W	1305 ft	Yes
Ashton	122	44º 59’ 41.93” N 98º 29’ 52.36” W	1292 ft	Yes
Athol**	10	45º 00’ 31.88” N 98º 35’ 47.38” W	1293 ft	No
Brentford	77	45º 09’ 36.89” N 98º 19’ 22.35” W	1301ft	No
Conde	170	45º 09’ 25.88” N 98º 05’ 51.31” W	1322 ft	No
Doland	180	44º 53’ 44.91” N 98º 06’ 02.36” W	1351ft	Yes
Frankfort	149	44º 52’ 35.97” N 98º 18’ 13.30” W	1298 ft	No
Mansfield**	60	45º 14’ 34.72” N 98º 33’ 46.86” W	1298 ft	No
Mellette	210	45º 09’ 15.95” N 98º 29’ 51.32” W	1297 ft	No
Northville	143	45º 09’ 14.17” N 98º 34’ 57.01” W	1299 ft	No
Tulare	207	44º 44’ 16.84” N 98º 30’ 35.36” W	1316 ft	Yes
Turton	48	45º 02’ 58.86” W 98º 05’ 44.41” N	1331 ft	No

Table 1.2 lists the Spink County Townships by population:

Township	Population	Township	Population
Antelope	58	Jefferson	61
Athol	65	Lake	104
Belle Plaine	79	La Prairie	40
Belmont	65	Lincoln	241
Benton	27	Lodi	80
Beotia	31	Mellette	130
Buffalo	56	Northville	192
Capitola	138	Olean	31
Clifton	43	Prairie Center	81
Conde	27	Redfield	463
Cornmwall	45	Richfield	25
Crandon	73	Spring	32
Exline	54	Sumner	11
Frankfort	39	Tetonka	58
Garfield	55	Three Rivers	91
Great Bend	44	Tulare	48
Groveland	42	Turton	25
Harmony	63	Union	51
Harrison	38		

II. PREREQUISITES

CHANGES/REVISIONS TO PREREQUISITES:
The Prerequisites section is entirely new to the Spink County PDM as it is required by the 2008 Crosswalk, but did not exist in the 2003 draft.

ADOPTION BY LOCAL GOVERNING BODY

The local governing body that oversees the update of the Spink County Pre-Disaster Mitigation (PDM) Plan is the Spink County Commission. The Commission has tasked the Spink County Emergency Management Office with the responsibility of ensuring that the PDM Plan is compliant with Federal Emergency Management Agency (FEMA) Guidelines and corresponding regulations.

MULTI-JURISDICTIONAL PLAN PARTICIPATION

This plan is a multi-jurisdictional plan which serves the entire geographical area located within the boundaries of Spink County, South Dakota. Spink County has ten incorporated municipalities. Most of the municipalities located within Spink County elected to participate in the planning process and the update of the existing Spink County Pre-Disaster Mitigation (PDM) Plan. The participating local jurisdictions include the following municipalities:

Table 2.1: Plan Participants

New Participants	Continuing Participants	Not Participating
	Ashton	
Redfield Energy	Brentford	Athol
SDDC	Conde	Mansfield
Northern Electric		Hitchcock
Northwestern School	Frankfort	Cottonwood Lake
Conde Township	Northville	Doland
	Redfield	Mellette
	Tulare	Turton

The non-participants include Doland, Turton, Mellette, and Hitchcock who chose not to participate as well as the unincorporated communities of Athol, Mansfield, and Cottonwood Lake. The non-participating communities will be given the option to complete the requirements for the plan and to formally adopt the plan during the annual update of the plan. Hitchcock which has a boundary that runs into Spink County, is located primarily in Beadle County and has participated in and adopted the Beadle County PDM Plan.

The new participants are private businesses that took part in the planning process and decided to adopt the County PDM plan.

Cottonwood Lake is located just 12 miles from of Redfield and has experienced growth in the last decade, with an estimated 40 year-round residents as well as many seasonal residents. Athol is located north of Redfield approximately 13 miles and has a population of 10 people or less. Approximately 60 people live in the unincorporated area of Mansfield which is on the northern border of Spink County and partially located in Brown County.

The Spink County Commission and each of the listed participating municipalities will pass resolutions to adopt the updated PDM Plan. In addition to these municipalities, the South Dakota Developmental Center (SDDC) and two private businesses, Redfield Energy and Community Memorial Hospital, also participated in the plan update and will pass a resolution to adopt the Spink County PDM Plan.

Several townships participated in the planning activities for the plan update but because the townships are too small, both in population and in resources, to be capable of handling disaster needs on their own, the townships are served by the County whenever necessary. The townships were invited to participate in the PDM Plan update and asked to submit information to the plan author for projects they would like to see included in the PDM plan. Due to their participation in the planning process, their projects will be considered before other projects with the same ranking on the priority list or that have a similar benefit-cost ratio (BCR).

The Spink County PDM Plan will be adopted by resolution by the participating incorporated municipalities, the Spink County Commission, SDDC, Redfield Energy, and Community Memorial Hospital. The Resolutions of Adoption are included as supporting documentation for the PDM Plan. The dates of adoption by resolution for each of the jurisdictions are summarized in Table 2.2.

Table 2.2: Dates of Plan Adoption by Jurisdiction

Jurisdiction	Date of Adoption
Spink County Commission	
Ashton	
Brentford	
Conde	
Doland	
Frankfort	
Mellette	
Northville	
Redfield	
Tulare	
Turton	
SDDC	7/1/2013
Redfield Hospital	
Community Memorial Hospital	
Northern Electric	
Township/Schools	

All of the participating jurisdictions were involved in the plan update. Representatives from each municipality, the County, SDDC, Redfield Energy, Community Memorial Hospital, and several townships attended the planning meetings and provided valuable perspective on the changes required for the plan. All representatives took part in the risk assessment by completing the risk assessment worksheets which are included as Appendix C and by profiling the risks.

Representatives also took information from the PDM planning meetings back to their respective councils and presented the progress of the plan update on a monthly basis. The local jurisdictions have also presented the Resolution of Adoption to their councils and will pass the resolutions upon FEMA approval of the PDM Plan update. The Resolutions are included as Attachment B at the end of this section.

Table 2.3 was derived to help define "participation" for the local jurisdictions who intend on adopting the plan. Out of eleven categories, each jurisdiction must have at least eight of the participation requirements fulfilled.

Table 2.3. Record of Participation

Nature of Participation	Ashton	Brentford	Conde	Doland	Frankfort	Mellette	Northville	Redfield	Tulare	Turton
Attended Meetings or work sessions (a minimum of 4 meetings will be considered satisfactory).	☒	☒	☒	☐	☒	☐	☒	☒	☒	☐
Submitted inventory and summary of reports and plans relevantto hazard mitigation.	☒	☒	☒	☐	☒	☐	☒	☒	☒	☐
Submitted Risk Assessment Worksheet.	☒	☒	☒	☐	☒	☐	☒	☒	☒	☐
Submitted description of what is at risk (including local critical facilities and infrastructure at risk from specific Hazards) Worksheet 3A		☒		☐	☒	☐	☒	☒	☒	☐
Submitted a description or map of local land-use patterns (current and proposed/expected).	C	C	C	C	C	C	C	☒	C	C
Developed goals for the community.	☒	☒	☒	☐	☒	☐	☒	☒	☒	☐
Developed mitigation actions with an analysis/explanation of why those actions were selected.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Prioritized actions emphasizing relative cost-effectiveness.	☒	☒	☒	☐	☒	☐	☒	☒	☒	☐
Reviewed and commented on draft Plan.	☐	☐	☒	☐	☐	☐	☒	☐	☐	☐
Hosted opportunities for public involvement (allowed time for public comment at a minimum of 2 city council meetings after giving a status report on the progress of the PDM Plan update)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

III. PLANNING PROCESS

CHANGES/REVISIONS TO PLANNING PROCESS:
Planning Process is an entirely new section to the Spink County PDM as it is required by the 2008 Crosswalk, but did not exist in the 2003 draft.

DOCUMENTATION OF THE PLANNING PROCESS

"An open and public involvement process is essential to the development of an effective plan." Requirement 201.6(b).

Public meetings were held at the Spink County Courthouse to inform the public about the required PDM Plan update. The Spink County Emergency Manager worked with NECOG staff to organize resources and sent out a mailing to all the stakeholders, community organizations, municipalities, townships, universities, and non-profits. A steering committee was formed from those persons who attended the public meetings. None had previously served as planning committee members during the drafting of the first PDM plan. After the informational meetings were held, the steering committee started working through the existing plan and noting deficiencies, corrections, and updates that needed to be made. The meeting minutes from each of the planning meetings outlines exactly which sections of the plan were revised at each of the meetings and are included as Appendix A.

The 2008 PDM plan did not include all of the necessary requirements found in the 2011 Local Mitigation Plan Review Tool provided by FEMA. Thus, to ensure that the updated plan included everything required by FEMA, the committee meetings used the planning tool to guide the discussions. The 2008 PDM Plan was then compared to the new Planning Tool and any portion of the 2008 PDM Plan that was not needed to fulfill the new requirements was eliminated and deficiencies were noted as areas of focus.

The sections of the 2008 plan that were deemed useful were reorganized and placed under the appropriate sections of the new plan. This process was completed through a number of work sessions which were advertised in the local newspapers, radio announcements, and notices were sent to the stakeholders. The date of the next meeting was set at the end of each of the meetings. These methods of notifying the public of the plan update process were determined by the steering committee to be the most likely way to create public awareness and public involvement in the process of updating the PDM Plan. The Plan Author followed the direction provided at the FEMA G318 Mitigation Planning Workshop for Local Governments and also used the FEMA Multi-Hazard Mitigation How-To Guidance.

SELECTION OF THE PLANNING TEAM [§201.6(c)(1)]

The Spink County Emergency Manager and staff from Northeast Council of Governments led the development of the plan update. Participating Municipalities and Private Businesses were also instrumental in leading the discussions at the PDM planning meetings. The local jurisdictions were represented by city council members

and/or finance officers who attended the meetings. The council members then took the information from the work sessions back to their jurisdictions and discussed the progress of the plan at their council meetings. Additionally, there were several township representatives who attended the meetings. There were three external contributors such as contractors or private businesses, which include South Dakota Developmental Center, Redfield Energy, and Community Memorial Hospital. Those who attended the initial planning meeting for the PDM Plan update were asked to volunteer to serve on the planning committee. The planning committee was tasked with reviewing the drafts and providing comments after Northeast Council of Governments initiated changes to the existing plan. Each of the local jurisdictions had a member of their respective councils represent the municipalities in the plan. Those representatives are listed by jurisdiction:

Table 3.1: PDM Plan Representatives for Local Jurisdictions

Ashton	Carol Groft, City Finance Officer
Brentford	Arlene Duff, Treasurer
Conde	Cindy Smith, President
Doland	Kam Deslauriers
Frankfort	Lynda Marzahn, Finance Officer
Mellette	Brian Bauer, Mayor
Northville	Clayton Blachford, President
Redfield	Adam Hansen, Finance Officer
Tulare	Gene Stellmacher, City Council
Turton	No representation
SDDC	Russ Franks
Northern Electric	Mike Kelly**
Redfield Energy	Simon Appel, Representative
Township-Conde	Julie Bruckner
Northwestern School	Ray Sauerwein**

** Did not attend any of the planning meetings, but submitted information and plans on adopting the plan

The representatives from the municipalities were asked to share the progress of the plan at their monthly council/board meetings and to ensure that those attending the meetings were aware that they are invited to make comments on and participate in the process of updating the new plan. Comments provided by local residents at the city council meetings were collected and incorporated into the plan.

PUBLIC INVOLVEMENT [§201.6(b)(1)]

The public was provided several opportunities to comment on the plan during the drafting stages, both at the PDM Planning Meetings and at City Council Meetings. There were several work sessions and public hearings held to keep the public updated and involved in the plan, however, no one from the public showed up to comment on the plan or to help with the plan update. Those who were most involved were the representatives from the municipalities and those previously mentioned as being instrumental in leading discussions. The municipalities put the PDM plan update on the agenda at their council meetings and allowed people to comment at the meetings. Table 3.2 identifies the location and date of each opportunity that was provided for the public to comment and how it was advertised. After the plan was drafted it was posted on the Spink County

Website, City of Redfield Website, SDDC &Redfield Energy Websites and emailed to all of the participants and to the emergency managers in the neighboring counties of: Clark, Day, Edmunds, Faulk, Hand, Beadle, and Brown. Everyone who received an email copy of the plan draft were allowed 45 days to comment on the draft.

Table 3.2: Opportunities for Public Comment

Location of Opportunity	Date	Type of Participation			How Was Meeting Advertised			
		City Council Meeting	PDM Meeting	Survey	Public Notice	Agenda	Mailing	Website
Ashton		☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐
Brentford		☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐
Conde	07/09/2012	☐	☐	☐	☐	☐	☐	☐
	08/06/2012	☐	☐	☐	☐	☐	☐	☐
Doland		☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐
Frankfort		☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐
Mellette		☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐
Northville		☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐
Redfield		☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐
Tulare		☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐
Turton		☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐
Spink County		☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐

**Asterisk denotes communities that will provide second opportunity after plan status changes to “approvable pending adoption.

TECHNICAL REVIEW OF EXISTING DOCUMENTS [§201.6(b)(3)]

The review and incorporation of existing plans, studies, reports and technical information was completed by the local jurisdictions. Each of the communities were asked to provide a list of existing documents that they have available. Many of the smaller communities do not have such documents. Additionally, the 2008 PDM Plan was used as a resource for the new plan because most of the natural hazard profile research had already been completed when it was drafted. In addition to the 2008 PDM Plan, the plan author reviewed several other existing documents including but not limited to the South Dakota State Hazard Mitigation Plan, Spink County Hazmat Plan, Spink County Shelter Plan, the City of Redfield Zoning Ordinances and Comprehensive Plan, County Zoning Ordinances, the flood damage prevention ordinance, and Flood Insurance Rate Maps for the local jurisdictions. In Spink County, all of the municipalities except for Redfield are covered under the County Zoning Ordinances and Comprehensive Plan therefore they do not have their own individual zoning or planning documents. Enforcement of the county zoning is also managed by the County. A summary of the technical review and incorporation of existing plans is included in Table 3.6 provided on page 17.

Table 3.6 :Record of Review (Summary)

Existing Program/Policy/ Technical Documents	Local Jurisdiction									
	Ashton	Brentford	Conde	Doland	Frankfort	Mellette	Northville	Redfield	Tulare	Turton
Comprehensive Plan	C	C	C	C	C	C	C	O	C	C
Growth Management Plan	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Flood Damage Prevention Ordinance	✓	NA	NA	✓	NA	NA	NA	✓	✓	NA
Floodplain Management Plan	NA	NA	NA	NA	NA	NA	NA	✓	NA	NA
Flood Insurance Studies or Engineering studies for streams	✓	NA	NA	NA	NA	NA	NA	✓	NA	NA
Hazard Vulnerability Analysis (by the local Emergency Management Agency)	C	C	C	C	C	C	C	C	C	C
Emergency Operations Plan	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zoning Ordinance	C	C	C	C	C	C	C	✓	C	C
Building Code	C	C	C	C	C	C	C	C	C	C
Drainage Ordinance	NA	NA	NA	NA	NA	NA	NA	✓	NA	NA
Critical Facilities maps	NA	NA	NA	NA	NA	NA	NA	✓	NA	NA
Existing Land Use maps	NA	NA	NA	NA	NA	NA	NA	✓	NA	NA
Elevation Certificates	NA	NA	NA	NA	NA	NA	NA	✓	NA	NA
State Hazard Mitigation Plan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HAZUS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA : the jurisdiction does not have this program/policy/technical document

O : the jurisdiction has the program/policy/technical document, but did not review/incorporate it in the mitigation plan

C : the jurisdiction is regulated under the County's policy/program/technical document

✓ : the jurisdiction reviewed the program/policy/technical document

REVIEW OF THE 2008 PDM PLAN

The planning committee reviewed and analyzed each section of the plan and each section was revised as part of the update process. The 2008 PDM plan did not include all requirements listed in the Local Mitigation Plan Tool. When the steering committee reviewed the 2008 PDM plan, they found that the PDM plan would be more easily read and understood if it followed the outline of the planning tool. The outline was then used to create a new Table of Contents and the rest of the plan was developed from the Table of Contents. The plan author also used the Local Multi-hazard Mitigation Planning Guidance (dated July 1, 2008) and the How-to Guides provided by FEMA to develop tables for the updated plan.

When the planning committee reviewed the introduction and profile sections of the plan, it was determined that there were numerous sections including tables, graphs, and addendums that did not serve an immediate or identifiable purpose to the PDM Plan and thus, those sections were eliminated. The Hazards section of the plan, needed some revision in both language and format for better clarity, but the information provided in that section was useful and was reused whenever possible in the updated plan. Some of the areas were eliminated, and others were revised and rewritten. Every section of the plan was reconsidered by the planning committee and the group decided which sections were useful and which sections should be eliminated. The committee review of the plan took place over the course of several two-hour work sessions that were held at the Spink County Courthouse from 1:30 o'clock p.m. to 3:30 o'clock p.m. on the following dates:

June 12, 2012
July 10, 2012
August 14, 2012
September 11, 2012
October (no meeting; correspondence via email)
November 13, 2012

The meeting minutes from each of the work sessions identify each section of the hazard mitigation plan and how it was analyzed, discussion that took place, and changes that were made. The meeting minutes are attached as Appendix A to the plan for reference.

IV. RISK ASSESSMENT

CHANGES/REVISIONS TO RISK ASSESSMENT:

- Pages 19-22 of the Risk Assessment are new to the PDM Plan. While some of the information correlates to the 2008 draft of the PDM, the information was rewritten for clarity.
- The Natural Hazards in the PDM Jurisdiction was edited and rewritten for clarity, however the general information did not change.
- The Hazard Profile was reorganized and some new information, tables, and narrative were added
- Addressing Repetitive Loss Properties is a new section
- Addressing Vulnerability (Overview) is a new section but the information was taken from the 2008 PDM's Chapter 3: Hazards
- Identifying Structures is a new section but the information was taken from the County Profile section of the 2008 Plan. Values of the structures included in this section were updated.
- Estimating Potential Losses, Methodology for Calculating estimated losses and Analyzing Development Trends are entirely new sections

IDENTIFYING HAZARDS [§201.6(c)(2)(i)]

Many websites have been further developed and updated since the drafting and of the previous Spink County PDM plan in 2008, so the Planning Committee used some of those websites as resources for the updated plan. Specifically, the National Oceanic Atmosphere Administration (NOAA) and the Spatial Hazard Events and Losses Database for the United States (SHELDUS) were used to research natural hazards and disasters that have occurred within the last 10 years within the geographic location covered under the Spink County PDM Plan. A summary of the findings for significant hazard occurrences from the past 10 years is provided in Table 4.1:

Table 4.1: Significant Hazard Occurrences 2003-2012		
Type of Hazard	**# of Occurrences Since 2003**	**Source**
Drought	4	NOAA
Wildfire/ Forest Fire	102	NOAA & State Fire Marshall's Office
Flood	41	NOAA
Hail	45	NOAA & SHELDUS
Lightning	0	NOAA
Tornado	5	NOAA & SHELDUS
Temperature Extremes	11	NOAA
Winter Storm	6	NOAA
Thunderstorm and High Wind	21	NOAA & SHELDUS

While researching the hazard occurrences that have taken place in Spink County, it became evident that the information found on the NOAA and SHELDUS websites was incomplete. Therefore, other sources were contacted whenever possible. Specifically, NOAA only had five occurrence listed for wildfires in Spink County, but the State Fire Marshall's Office was contacted to verify that information. Paul Merriman, the State Fire Marshall, said their information is derived from the reports submitted by the local fire departments who respond to the fires. He also explained that since many of the fire departments in Spink County are Volunteer Fire Departments many times wildfires are extinguished and reports are never filed with the State. Thus, the information provided by the State Fire Marshall's office is not entirely complete either. For the purpose of this plan we have used the numbers provided by the State Fire Marshal's Office as a point of reference in determining the likelihood of a wildfire hazard occurrence within the jurisdiction. The information provided by Paul Merriman identifies 33 structure fires, 29 vehicle fires, and 102 outside fires reported between 2003 and 2012. The cause of the outside fires is not listed, so it is not known for certain whether all or some of these fires resulted due to a natural hazard occurrence or as a result of human behavior. From 2003-2012 the total dollar loss accumulated was $1,129,370. Additionally, the State Fire Marshall provided information about the number of injuries and fatalities reported as a result of these fires. According to Merriman's records, 1 civilian injury and zero civilian fatalities were reported and zero firefighter injuries were reported since 2003.

Table 4.2 is a list of natural hazards produced from the FEMA worksheets completed by each local jurisdiction located within Spink County. Representatives from each community completed the worksheet for their geographical location, while representatives of Spink County completed the worksheet for county-wide risks. All of the worksheets are included as Appendix C

Table 4.2: Natural Hazards Categorized by Likelihood of Occurrence		
High Probability	**Low Probability**	**Unlikely to Occur**
Communication Disruption	Aircraft Accident	Avalanche
Drought	Biological	Coastal Storm
Extreme Cold	Civil Disorder	Hurricane
Extreme Heat	HAZMAT	Volcanic Ash
Dam Failure	Landslide	Volcanic Explosion
Flood	National Emergency	Tsunami
Freezing Rain/Sleet/Ice	Radiological	
Hail	Subsidence	
Heavy Rain	Earthquake***	
Heavy Snow		
Ice Jam		
Lightning	***Earthquakes are marked with an asterisk because they occur but are so small that the effects are minimal. Thus, mitigation measures specifically for earthquakes are not a priority. ** Utility interruptions are not a natural hazard but often occur as a result of natural hazards such as ice storms and strong winds.	
Rapid Snow Melt		
Strong Winds		
Thunderstorm		
Tornado		
Transportation		
Urban Fire		
Utility Interruption**		
Wild Fire		

Every possible hazard or disaster was evaluated and then the disasters were placed in three separate columns depending on the likelihood of the disaster occurring in the PDM jurisdiction. Hazards that occur at least once a year or more were placed in the High Probability column; hazards that may have occurred in the past or could occur in the future but do not occur on a yearly basis were placed in the low probability column; and hazards or disasters that have never occurred in the area before and are unlikely to occur in the PDM jurisdiction any time in the future were placed in the Unlikely to Occur column. While man-made hazards were listed on the worksheets and discussed briefly during the completion of the worksheets, the steering committee decided to eliminate man-made hazards from the PDM plan because those types of hazards are difficult to predict and assess due to wide variations in the types, frequencies, and locations. Types and scopes of manmade hazards are unlimited.

Due to the topographical features of the County and the nature of the natural hazards that affect the geographical area covered by this PDM plan, most areas of the county have similar likelihood of being affected by the natural hazards identified. Only the natural hazards from the High Probability and Low Probability Columns will be further evaluated throughout this plan. All manmade hazards and hazards in the Unlikely to Occur column will not be further evaluated in the plan. Table 4.3 below identifies the hazards that will be addressed in the PDM Plan update throughout the planning process.

Hazards were identified for this plan in several ways, including: observing development patterns, interviews from towns and townships, public meetings, PDM worksessions, previous disaster declarations, consulting the State Hazard Mitigation Plan and research of the history of hazard occurrences located within Spink County.

Table 4.3: Overall Summary of Vulnerability by Jurisdiction

Natural Hazards Identified	Spink Co	Ashton	Brentfort	Conde	Doland	Frankfort	Mellette	Northville	Redfield	Tulare	Turton
Drought	M	H	L	M	O	L	O	L	L	L	O
Extreme Cold	H	M	L	H	O	M	O	L	L	M	O
Extreme Heat	L	H	L	M	O	L	O	L	L	M	O
Flood	H	H	M	M	O	H	O	H	H	M	O
Freezing Rain/Sleet	H	H	H	H	O	M	O	M	M	M	O
Hail	L	H	M	M	O	L	O	M	M	H	O
Heavy Rain	M	H	M	H	O	M	O	M	M	M	O
Ice Jam	M	M	L	L	O	L	O	L	M	L	O
Landslides	M	NA	NA	NA	O	NA	O	NA	H	NA	O
Lightning	M	M	L	L	O	L	O	L	L	L	O
Heavy Snow	H	H	M	H	O	M	O	M	M	M	O
Strong Winds	H	H	H	M	O	M	O	M	M	M	O
Earthquakes	L	L	L	L	O	L	O	L	L	L	O
Tornadoes	M	H	H	H	O	L	O	H	H	H	O
Wildfire	L	M	M	L	O	L	O	L	L	M	O

NA : Not applicable; not a hazard to the jurisdiction
L : Low risk; little damage potential (minor damage to less than 5% of the jurisdiction)
M : Medium risk; moderate damage potential (causing partial damage to 5-10% of the jurisdiction, and irregular occurrence)
H : High risk; significant risk/major damage potential (for example, destructive, damage to more than 10% of the jurisdiction and/or regular occurrence)
O : Jurisdiction did not fill out risk assessment worksheet

NATURAL HAZARDS IN THE PDM PLAN JURISDICTION

Descriptions of the natural hazards likely to occur in the PDM Jurisdiction were taken directly from the 2003 Spink County PDM Plan. Some of the descriptions were revised for better clarity. For the purpose of consistency throughout the plan, additional definitions were included to reflect all of the hazards that have a chance of occurring in the area and all of the hazards are alphabetized. For all of the hazards identified the probability of future occurrence is expected to be the same for all of the jurisdictions covered in the Plan.

Blizzards are a snow storm that lasts at least 3 hours with sustained wind speeds of 35 mph or greater, visibility of less than a quarter mile, temperatures lower than 20°F and white out conditions. Snow accumulations vary, but another contributing factor is loose snow existing on the ground which can get whipped up and aggravate the white out conditions. When such conditions arise, blizzard warnings or severe blizzard warnings are issued. Severe blizzard conditions exist when winds obtain speeds of at least 45 mph plus a great density of falling or blowing snow and a temperature of 10°F or lower.

Drought is an extended period of months or years when a region notes a deficiency in its water supply. Generally, this occurs when a region receives consistently below average precipitation. It can have a substantial impact on the ecosystem and agriculture of the affected region. Although droughts can persist for several years, even a short, intense drought can cause significant damage and harm the local economy. This global phenomenon has a widespread impact on agriculture.

Dam Failure Dams function to serve the needs of flood control, recreation, and water management. During a flood, a dam's ability to serve as a control agent may be challenged. An excessive amount of water may result in a dam breach, simply an overflowing. Dams that are old or unstable, dams that receive extreme amounts of water, or dams that get debris pile-up behind their face may result in dam failure, a cracking and/or breaking. The County has 3 dams and all 3 have the potential to endanger lives and damage property.

Earthquakes are a sudden rapid shaking of the earth caused by the shifting of rock beneath the earth's surface. Earthquakes can cause buildings and bridges to collapse, disrupt gas, electric and phone lines, and often cause landslides, flash floods, fires, avalanches, and tsunamis. Larger earthquakes usually begin with slight tremors but rapidly take the form of one or more violent shocks, and are followed by vibrations of gradually diminishing force called aftershocks. The underground point of origin of an earthquake is called its focus; the point on the surface directly above the focus is the epicenter.

Extreme Cold What constitutes extreme cold and its effects can vary across different areas of the country. In regions relatively unaccustomed to winter weather, near freezing temperatures are considered "extreme cold," however, Eastern South Dakota is prone to much more extreme temperatures than other areas in the country. Temperatures typically range between zero degrees Fahrenheit and 100 degrees Fahrenheit, so extreme cold could be defined in the Spink County PDM jurisdiction area as temperatures below zero.

Extreme Heat, also known as a Heat Wave, is a prolonged period of excessively hot weather, which may be accompanied by high humidity. There is no universal definition of a heat wave; the term is relative to the usual weather in the area. Temperatures in Spink County have a very wide range typically between 0-100 degrees Fahrenheit, therefore anything outside those ranges could be considered extreme. The term is applied both to routine weather variations and to extraordinary spells of heat which may occur only once a century.

Flooding is an overflow of water that submerges land, producing measurable property damage or forcing evacuation of people and vital resources. Floods can develop slowly as rivers swell during an extended period of rain, or during a warming trend following a heavy snow. Even a very small stream or dry creek bed can overflow and create flooding. Two different types of flooding hazards are present within Spink County.

1. Inundation flooding occurs most often in the spring. The greatest risks are realized typically during a rapid snowmelt, before ice is completely off all of the rivers. The river system throughout Spink County consists of the James River and its two tributaries, the Turtle Creek and Snake Creek. The three waterways converge in the east-central portion of the county, all within several miles of the county's largest city of Redfield. The James River Basin (which includes a large portion of Spink County) is the largest of the East River Basin Systems, covering a substantial portion of Eastern South Dakota. It is bordered on the east by highlands of the Coteau de Prairie and on the west by the high ground of the Coteau de Missouri. The valley is a nearly flat stretch of land about 216 miles long and averaging 60 miles wide. It is only in the southern portion that the topography becomes steeper. There is little variance in the elevation of the basin. At Columbia, where the river basin forms in South Dakota, the elevation is 1,290 feet. At the southern terminus of the basin near Yankton, the elevation is 1,162 feet.

2. *Flash Flooding* is more typically realized during the summer months. This flooding is primarily localized, though enough rain can be produced to cause inundation flooding in areas along the James River. Heavy, slow moving thunderstorms often produce large amounts of rain. Spink County is a relatively flat area, allowing moisture to remain in low-lying areas. The threat of flooding would be increased during times of high soil moisture. In addition, debris carried by floodwaters can significantly compromise the effectiveness of otherwise adequately designed bridges, dams, culverts and other structures. Spink County has been a part of a number of past flooding events that have hit the region. They are too numerous to mention. However, several events are specific to the county and worth mention. In the spring of 1993, snow melt caused $500K property damage in the county. In the spring of 1998, snow melt resulted in flooding that cost the county $3.8 million in property damage. Summer flash floods have also occurred. In July 1994, the Frankfort area experienced a flash flood resulting in $500K property damage and $50 million in crop damage. A year later, many areas throughout the county saw a flash flood as tremendous rains pummeled the area. In July of 1997, Conde had a similar experience to Frankfort several years earlier. Past history has suggested that this area is of concern for flooding. In future years, major projects not included in this plan may be considered, and the PDM will be updated to include such hazards. Due to the flat land in Eastern South Dakota and the various climates, it is difficult to predict what disasters may affect Spink County and participating entities.

Freezing Rain/Ice occurs when temperatures drop below 30 degrees Fahrenheit and rain starts to fall. Freezing rain covers objects with ice, creating dangerous conditions due to slippery surfaces, platforms, sidewalks, roads, and highways. Sometimes ice is unnoticeable, and is then referred to as black ice. Black ice creates dangerous conditions, especially for traffic. Additionally, a quarter inch of frozen rain can significantly damage trees, electrical wires, weak structures, and other objects due to the additional weight bearing down on them.

Hail is formed through rising currents of air in a storm. These currents carry water droplets to a height at which they freeze and subsequently fall to earth as round ice particles. Hailstones usually consist mostly of water ice and measure between 5 and 150 millimeters in diameter, with the larger stones coming from severe and dangerous thunderstorms.

Heavy Rain is defined as precipitation falling with intensity in excess of 0.30 inches (0.762 cm) per hour. Short periods of intense rainfall can cause flash flooding while longer periods of widespread heavy rain can cause rivers to overflow.

Ice Jams occur when warm temperatures and heavy rain cause snow to melt rapidly. Snow melt combined with heavy rains can cause frozen rivers to swell, which breaks the ice layer on top of the river. The ice layer often breaks into large chunks, which float downstream and often pile up near narrow passages other obstructions, such as bridges and dams.

Landslide is a geological phenomenon which includes a wide range of ground movement, such as rock falls, deep failure of slopes and shallow debris flows, which can occur in offshore, coastal and onshore environments. Although the action of gravity is the primary driving force for a landslide to occur, there are other contributing factors build up specific sub-surface conditions that make the area/slope prone to failure, whereas the actual landslide often requires a trigger before being released.

Lightning results from a buildup of electrical charges that happens during the formation of a thunderstorm. The rapidly rising air within the cloud, combined with precipitation movement within the cloud, results in these charges. Giant sparks of electricity occur between the positive and negative charges both within the atmosphere and between the cloud and the ground. When the potential between the positive and negative charges becomes too great, there is a discharge of electricity, known as lightning. Lightning bolts reach temperatures near 50,000˚ F in a split second. The rapid heating and expansion, and cooling of air near the lightning bolt causes thunder.

Severe Winter Storms deposit four or more inches of snow in a 12-hour period or six inches of snow during a 24-hour period. Such storms are generally classified into four categories with some taking the characteristics of several categories during distinct phases of the storm. These categories include: freezing rain, sleet, snow, and blizzard. Generally winter storms can range from moderate snow to blizzard conditions and can occur between October and April. The months of May, June, July, August, and September could possibly see snow, though the chances of a storm is very minimal. Like summer storms, winter storms are considered a weather event not a natural hazard, and thus will not be evaluated as a natural hazard throughout this plan.

Sleet does not generally cling to objects like freezing rain, but it does make the ground very slippery. This also increases the number of traffic accidents and personal injuries due to falls. Sleet can severely slow down operations within a community. Not only is there a danger of slipping, but with wind, sleet pellets become powerful projectiles that may damage structures, vehicles, or other objects.

Snow is a common occurrence throughout the County during the months from October to April. Accumulations in dry years can be as little as 5-10 inches, while wet years can

see yearly totals between 110-120 inches. Snow is a major contributing factor to flooding, primarily during the spring months of melting.

Strong winds are usually defined as winds over 40 m/h, are not uncommon in the area. Winds over 50 m/h can be expected twice each summer. Strong winds can cause destruction of property and create a safety hazards resulting from flying debris. Strong winds also include severe localized wind blasting down from thunderstorms. These downward blasts of air are categorized as either microbursts or macrobursts depending on the amount geographical area they cover. Microbursts cover an area less than 2.5 miles in diameter and macrobursts cover an area greater than 2.5 miles in diameter.

Subsidence is defined as the motion of a surface as it shifts downward relative to a datum. The opposite of subsidence is uplift, which results in an increase in elevation. There are several types of subsidence such as dissolution of limestone, mining-induced, faulting induced, isostatic rebound, extraction of natural gas, ground-water related, and seasonal effects.

Summer Storms are generally defined as atmospheric hazards resulting from changes in temperature and air pressure which cause thunderstorms that may cause hail, lightning, strong winds, and tornados. Summer storms are considered a weather event rather than a natural hazard, therefore summer storms are not evaluated as a natural hazard throughout this plan.

Thunderstorms are formed when moisture, rapidly rising warm air, and a lifting mechanism such as clashing warm and cold air masses combine. The three most dangerous items associated with thunderstorms are hail, lightning, and strong winds.

Tornados are violent windstorms that may occur singularly or in multiples as a result of severe thunderstorms. They develop when cool air overrides warm air, causing the warm air to rapidly rise. Many of these resulting vortices stay in the atmosphere, though touchdown can occur. The Fujita Tornado Damage Scale categorizes tornadoes based on their wind speed:

F0=winds less than 73 m/h
F1=winds 73-112 m/h
F2=winds 113-157 m/h
F3=winds 158-206 m/h
F4=winds 207-260 m/h
F5=winds 261-318 m/h
F6=winds greater than 318 m/h

Wildland Fires are uncontrolled conflagrations that spread freely through the environment. Other names such as brush fire, bushfire, forest fire, grass fire, hill fire, peat fire, vegetation fire, and wildland fire may be used to describe the same phenomenon. A wildfire differs from the other fires by its extensive size; the speed at which it can spread out from its original source; its ability to change direction unexpectedly; and to jump gaps, such as roads, rivers and fire breaks.

Fires start when an ignition source is brought into contact with a combustible material that is subjected to sufficient heat and has an adequate supply of oxygen from the ambient air. Ignition may be triggered by natural sources such as a lightning strike, or

may be attributed to a human source such as “discarded cigarettes, sparks from equipment, and arched power lines.

HAZARD PROFILE [§201.6(c)(2)(ii)]

Requirement §201.6 (c)(2)(i): [The risk assessment shall include a] description of the type of the… location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

Geographic location of each natural hazard is addressed in the updated plan. Most of the hazards identified have the potential of occurring anywhere in the County. Previous occurrences are listed individually by the type of hazard and by location in the following tables. Table 4.4 identifies the Latitude and Longitude of the local jurisdictions along with the population, elevation, and number occupied homes according to the 2010 US Census.

Table 4.4: Latitude/Longitude of Communities within the County

City	Population	Location	Elevation	Occupied Units
Ashton	122	44º 59’ 41.93” N 98º 29’ 52.36” W	1292 ft	52
Brentford	77	45º 09’ 36.89” N 98º 19’ 22.35” W	1301ft	30
Conde	140	45º 09’ 25.88” N 98º 05’ 51.31” W	1322 ft	76
Doland	180	44º 53’ 44.91” N 98º 06’ 02.36” W	1351ft	95
Frankfort	149	44º 52’ 35.97” N 98º 18’ 13.30” W	1298 ft	61
Mellette	130	45º 09’ 15.95” N 98º 29’ 51.32” W	1297 ft	90
Northville	143	45º 09’ 14.17” N 98º 34’ 57.01” W	1299 ft	52
Redfield	2,333	44º 52’ 33.06” N 98º 31’ 07.41” W	1305 ft	1,057
Tulare	207	44º 44’ 16.84” N 98º 30’ 35.36” W	1316 ft	90
Turton	48	45º 02’ 58.86” W 98º 05’ 44.41” N	1331 ft	26

Population and Occupied Units information was collected from US Census Bureau website: http://factfinder2.census.gov

Additionally, the extent (i.e., magnitude or severity) of each hazard, information on previous occurrences of each hazard and the probability of future events (i.e., chance or occurrence) for each hazard are addressed in the following tables. While the planning

committee reviewed all hazard occurrences that have been reported in the last 100 years, the list for some of the hazards was extremely long. The information provided in the tables is not a complete history, but rather an overview of the hazard events which have occurred over the last ten years. The planning committee felt the hazard trend for the last 10 years could be summarized in this section and decided to include any new occurrence that have taken place since the previous plan was drafted. The complete history which was included in the 2008 Plan, was not changed and can be found at the end of each hazard section.

DAM FAILURE

Dam breach or failure is of lesser concern for the citizens of Spink County than flooding due to the location of the dams in the County. Dam Failure is usually associated with intense rainfall or a prolonged flood condition (rainy day), or it can occur anytime (clear day). Dam failure can be caused by a variety of sources, to include: faulty design, construction and operational inadequacies, intentional breaches, or a flood event larger than the design. The greatest threat from dam failure is to people and property in areas immediately below the dam since flood discharges decrease as the flood wave moves downstream.

The degree and extent of damage depend on the size of the dam and circumstances of the failure. A large dam failure might bring about considerable loss of property, destruction of cropland, roads and utilities and even loss of life; as well as similar consequences to a small dam failure: loss of irrigation water for a season and extreme financial hardship to many farmers. More severe consequences of dam failure can include loss of income, disruption of services and environmental devastation.

Redfield Dam Data

Spink County has one high-risk dam identified by the National Inventory of Dams: Redfield Dam. The Redfield Dam is owned by South Dakota Game, Fish and Parks. It has a height of 27 feet and capacity of 12,000 acres feet. The Redfield Dam has surface area acreage of 1900 and a hazard rating of one.

In general, Redfield Dam is in reasonably good structural condition. It is, however, seriously inadequate hydrological because the dam is capable of passing about 30 percent of the Probable Maximum Flood (PMF). Since Redfield Dam is an intermediate size dam with a Category I hazard classification, the minimum spillway design flood is 50 percent of the PMF. The Redfield Dam Emergency Preparedness Plan has been included in Addendum J.

The locations of the dams are found in Table 4.5:

4.5 Dam Locations in Spink County

ID	Name	Owner	Location (Lat/Long)	Hazard	Height	Storage
SD0000	Cemetery Dam		44.8816396 -98.2203696	H		
SD0000	Dudley Dam	GF&P	44.8449747 -98.2870372			
SD0000	Mirage Dam	GF&P	44.7849732 -98.0987028			
SD0000	Redfield Lake	City of Redfield	44.8780317 -98.529262	M	27ft	12,000

DROUGHT AND WILDFIRE

South Dakota's climate is characterized by cold winters and warm to hot summers. There is usually light moisture in the winter and marginal to adequate moisture for the growing season for crops in the eastern portion of the state. Semi-arid conditions prevail in the western portion. This combination of hot summers and limited precipitation in a semi-arid climatic region places South Dakota present a potential position of suffering a drought in any given year. The climatic conditions are such that a small departure in the normal precipitation during the hot peak growing period of July and August could produce a partial or total crop failure.

South Dakota's economy is closely tied to agriculture and only magnifies the potential loss which could be suffered by the state's economy during drought conditions. Table 4.6 identifies the 10-year drought history for Spink County.

Table 4.6: Spink County 10-year Drought History

Location	Date	Time	Type
Spink County	6/1/2002	12:00 AM	Drought
Spink County	7/18/2006	12:00 AM	Drought
Spink County	8/1/2006	12:00 AM	Drought
Spink County	11/01/2012	12:00 AM	Drought
Spink County	12/01/2012	12:00 AM	Drought

Roughly every 50 years a significant drought is experienced within the county, while many less severe droughts can occur at times every three years.

Major drought occurrences:

- 1987-1990: An abnormally low amount of precipitation in the summer of 1987 combined with a hot and dry summer during 1988, left South Dakota in serious condition.
- 1930s: During the infamous dust bowl years, Spink County was not spared a fair share of problems. Particularly dry summers were in 1934 and 1936.
- 1880s-1890s: The years 1887, 1894-1896, 1898-1901 were very dry years.

A strong possibility exists for simultaneous emergencies during droughts. Wildfires are the most common. As mentioned on page 20 of this plan, the accuracy of the fire history is questionable, because the State Fire Marshall's Office collects information from the County, thus the accuracy of the information reported relies on the local fire departments, some of which are volunteer fire departments that are responsible for filing the reports.

The 2008 Plan did not list or identify the history of wildfire occurrences. Several notable structural fires were identified, but were left out of the 2012-2013 Plan Update because structural fires are not a natural hazard.

FLOOD

Flooding is a temporary overflow of water onto lands not normally covered by water producing measurable property damage or forcing evacuation of people and resources. Floods can result in injuries and even loss of life when fast flowing water is involved. Six inches of moving water is enough to sweep a vehicle off a road. Disruption of communication, transportation, electric service, and community services, along with contamination of water supplies and transportation accidents are very possible. Table 4.7 is a 10-year flood history in Spink County from 2002 to 2012.

Table 4.7 Spink County 10-year Flood History

Location	Date	Time	Time Zone	Hazard	Property & Crop Damage
SPINK (Zone)	07/13/2005	03:15	CST	Flood	0.00K
DOLAND	04/06/2006	19:00	CST	Flood	0.00K
ASHTON	05/02/2007	06:00	CST-6	Flood	0.00K
TULARE	05/06/2007	09:15	CST-6	Flood	0.00K
ASHTON	06/01/2007	00:00	CST-6	Flood	0.00K
ASHTON	07/01/2007	00:00	CST-6	Flood	0.00K
ASHTON	08/01/2007	00:00	CST-6	Flood	0.00K
ASHTON	09/01/2007	00:00	CST-6	Flood	0.00K
ASHTON	03/21/2009	07:00	CST-6	Flood	0.00K
ASHTON	04/01/2009	00:00	CST-6	Flood	50.00K
REDFIELD	05/01/2009	00:00	CST-6	Flood	0.00K
MELLETTE	06/01/2009	00:00	CST-6	Flood	0.00K
MELLETTE	07/01/2009	00:00	CST-6	Flood	0.00K
MELLETTE	08/01/2009	00:00	CST-6	Flood	0.00K
MELLETTE	09/01/2009	00:00	CST-6	Flood	0.00K
DUXBURY	03/14/2010	08:00	CST-6	Flood	0.00K
TULARE	03/15/2010	08:00	CST-6	Flood	0.00K
MANSFIELD	03/15/2010	08:00	CST-6	Flood	0.00K
DUXBURY	04/01/2010	00:00	CST-6	Flood	0.00K

MANSFIELD	04/01/2010	00:00	CST-6	Flood	0.00K
TULARE	04/01/2010	00:00	CST-6	Flood	0.00K
DUXBURY	05/01/2010	00:00	CST-6	Flood	0.00K
DUXBURY	06/01/2010	00:00	CST-6	Flood	0.00K
TULARE	06/15/2010	08:00	CST-6	Flood	0.00K
DUXBURY	07/01/2010	00:00	CST-6	Flood	0.00K
TULARE	07/10/2010	07:00	CST-6	Flood	0.00K
DUXBURY	08/01/2010	00:00	CST-6	Flood	0.00K
DUXBURY	09/01/2010	00:00	CST-6	Flood	0.00K
DUXBURY	10/01/2010	00:00	CST-6	Flood	0.00K
MANSFIELD	03/15/2011	08:00	CST-6	Flood	0.00K
TULARE	03/20/2011	08:00	CST-6	Flood	0.00K
DUXBURY	03/20/2011	08:00	CST-6	Flood	0.00K
TULARE	04/01/2011	00:00	CST-6	Flood	0.00K
MANSFIELD	04/01/2011	00:00	CST-6	Flood	0.00K
DUXBURY	04/01/2011	00:00	CST-6	Flood	0.00K
TULARE	05/01/2011	00:00	CST-6	Flood	0.00K
MANSFIELD	05/01/2011	00:00	CST-6	Flood	0.00K
DUXBURY	05/01/2011	00:00	CST-6	Flood	0.00K
SPINK CO.	06/01/2011	00:00	CST-6	Flood	0.00K
SPINK CO.	06/01/2011	00:00	CST-6	Flood	0.00K
SPINK CO.	06/20/2011	14:00	CST-6	Flood	0.00K
SPINK CO.	06/23/2011	07:00	CST-6	Flood	0.00K
MANSFIELD	07/01/2011	00:00	CST-6	Flood	0.00K
DUXBURY	07/01/2011	00:00	CST-6	Flood	0.00K
TULARE	07/01/2011	00:00	CST-6	Flood	0.00K
DUXBURY	08/01/2011	00:00	CST-6	Flood	0.00K
DUXBURY	09/01/2011	00:00	CST-6	Flood	0.00K
DUXBURY	10/01/2011	00:00	CST-6	Flood	0.00K
DUXBURY	11/01/2011	00:00	CST-6	Flood	0.00K

Table 4.7 shows numerous flood events that occurred in Spink County over the course of the past decade. While this information is valuable in showing the likelihood of future flood events, the information collected from the NOAA website appears to be incomplete as it does not show values in the property and crop damage column. It would be reasonable to assume that damage was caused in each event listed but for whatever reason was not reported in dollars lost or damaged. For the purpose of mitigation planning future damage was estimated based on the historical evidence that flooding will occur in Spink County on a regular basis. One should note that the type of flooding is not always a result of an overflowing body of water but usually a result of high ground water table which leaves the ground saturated and unable to absorb any additional water from rainfall or snowmelt.

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The following information was taken from the 2008 Spink County disaster mitigation plan and includes details for major past flooding events for Spink County dating back to 1993. Spink County has been a part of a number of past flooding events that have hit the region. They are too numerous to mention. However, several events are specific to the county and worth mention.

- In the spring of 1993, snow melt caused $500K property damage in the county.

- In the spring of 1998, snow melt resulted in flooding that cost the county $3.8 million in property damage. Summer flash floods have also occurred.

- In July 1994, the Frankfort area experienced a flash flood resulting in $500K property damage and $50 million in crop damage. A year later, many areas throughout the county saw a flash flood as tremendous rains pummeled the area.

- In July of 1997, Conde had a similar experience to Frankfort several years earlier. Past history has suggested that this area is prone to flooding. In future years, major projects not included in this plan may be considered, and the PDM will be updated to include such hazards. Due to the flat land in Eastern South Dakota and the various climates, it is difficult to predict what disasters may affect Spink County and participating entities.

NFIP: **[§201.6(c)(2)(ii)]**

Currently 49 properties in Spink County, 4 of those located in Redfield, participate in the NFIP program which is an increase from 2008. The increase is primarily a result of the Flood Plain Manager encouraging new communities to participate in the National Flood Insurance Program. Spink County was also mapped in October of 2010 and new DFIRMS are available. Specific areas that are or could be prone to flooding are designated in the DFIRMS which are available for purchase online found on the Map Service Center website.

CRS Program:
Spink County is not part of the Community Rating System program at this time. The Flood Plain Administrator is aware of the program and plans on eventually taking part in it, but does not have it in the budget at this time.

Spink County is in the process of completing several mitigation activities. They were recently awarded an HMGP grant to purchase and install generators and sirens for several different locations throughout out the County. The project is not under way at this time as the County is still awaiting the official award and environmental clearance. The generators will provide backup power for lift stations, shelters, and other vital structures that are necessary for preventing further damage when power is lost during a natural hazard event. The sirens will ensure that there is adequate warning of severe weather for residents in small communities and rural areas throughout the County.

Other mitigation activities have included:

1. The City of Ashton recently completed a sanitary and storm sewer project that consisted of installing new sanitary sewer lines throughout the City and routing storm water through the old sanitary sewer lines to a ditch system on the outskirts of town. Prior to this project the City did not have a separate storm sewer and sanitary sewer which was causing the sanitary sewer system to become overloaded and forcing water into basements and low-lying areas.

2. Two properties in rural Spink County that are located right next to the James River, one near Ashton and one near Mellette have recently looked into the possibility of relocating the homes to location that is outside the flood zone. The homeowners have looked into using mitigation funds for the relocation but at this time are leaning towards the option of completing their relocation projects with funds obtained from the Increased Cost of Compliance (ICC) coverage which is included in their NFIP flood insurance policies. ICC will provide up to $30,000 to bring the structure into compliance with the established flood plain ordinance which requires that structures be elevated to at least one foot above the base flood elevation.

3. The City of Frankfort recently expanded the size of their existing wastewater treatment facility and the original design did not meet the requirements of the flood plain ordinance. The Flood Plain Administrator ensured that the construction of the new berm was above the established flood plain. The design was updated and thus the potential for flooding of the facility is reduced.

4. Fisher's Grove Campground will be relocated to the other side of the bridge in 2013 due to continuous problems with flooding of the Fisher's Grove Bridge which is currently the only way to access the campsites. The park and campground were closed for all of 2010 and 2011 due to flooding. Fisher's Grove is one of the only campgrounds in the area. The bridge will be left in place but will be converted to a walking bridge only. This park is owned by the South Dakota GFP and the State will be responsible for the work to be completed, however, they will have to get approval from the Spink County Flood Plain Administrator before construction commences.

These are just a few examples of how having a qualified Flood Plain Administrator is a mitigation activity in itself. Requiring that new construction meets the flood plain ordinance and having someone to enforce those requirements is essential to mitigation planning and helps reduce the risk of natural weather events becoming natural disasters.

CURRENT FLOODING CONDITIONS:

Flooding in Spink County continues to be a challenge to the residents and property owners who are affected each year. Mitigation for flooding is always a priority. The current situation is minimal since 2012 was relatively dry for the area. Numerous roads were damaged, some entirely under water, throughout much of 2010 and part of 2011, however the County and Townships have fixed all of the damaged roads and replaced some culverts over the past year.

HAIL

Table 4.8 indicates hail occurrences by location throughout the county. However, the information provided by the NOAA and SHELDUS websites was incomplete due to inconsistent reporting after such hazards occur. Obviously, with such a high number of occurrences it is reasonable to expect that at least some property or crop damage was sustained in the communities during some of the occurrences, even though the damage may not have been reported or recorded. It is possible that such damage was not reported because it was believed to be insignificant at the time, or because those responsible for reporting such information did not report to the proper agencies.

Table 4.8: Spink County 10-year Hail History

Location	Date	Time	Time Zone	Hazard	Mag.	Property Damage
TURTON	06/25/2002	14:58	CST	Hail	0.75 in.	0.00K
CONDE	06/25/2002	15:20	CST	Hail	1.00 in.	0.00K
CONDE	06/25/2002	15:25	CST	Hail	1.50 in.	0.00K
TURTON	06/25/2002	15:55	CST	Hail	0.75 in.	0.00K
REDFIELD	07/02/2002	07:20	CST	Hail	1.75 in.	0.00K
ATHOL	07/02/2002	08:20	CST	Hail	0.75 in.	0.00K
BRENTFORD	07/02/2002	08:25	CST	Hail	1.00 in.	0.00K
ASHTON	07/02/2002	09:14	CST	Hail	0.88 in.	0.00K
FRANKFORT	07/02/2002	10:03	CST	Hail	1.00 in.	0.00K
ASHTON	07/02/2002	10:35	CST	Hail	0.75 in.	0.00K
TURTON	08/11/2002	19:30	CST	Hail	0.75 in.	0.00K
NORTHVILLE	08/28/2002	14:25	CST	Hail	1.00 in.	0.00K

REDFIELD	08/28/2002	14:35	CST	Hail	1.00 in.	0.00K
ATHOL	08/28/2002	14:45	CST	Hail	0.75 in.	0.00K
NORTHVILLE	06/21/2003	20:45	CST	Hail	0.75 in.	0.00K
TURTON	06/22/2003	14:00	CST	Hail	0.88 in.	0.00K
DOLAND	07/20/2003	00:20	CST	Hail	1.00 in.	0.00K
FRANKFORT	07/20/2003	00:36	CST	Hail	0.75 in.	0.00K
FRANKFORT	07/29/2003	13:52	CST	Hail	0.88 in.	0.00K
DOLAND	07/29/2003	14:00	CST	Hail	0.75 in.	0.00K
ASHTON	08/20/2003	16:40	CST	Hail	0.75 in.	0.00K
DOLAND	08/20/2003	16:55	CST	Hail	0.88 in.	0.00K
TURTON	08/20/2003	16:59	CST	Hail	1.00 in.	0.00K
BRENTFORD	04/18/2004	13:30	CST	Hail	1.00 in.	0.00K
CONDE	04/18/2004	13:35	CST	Hail	0.75 in.	0.00K
DOLAND	06/07/2004	21:10	CST	Hail	0.75 in.	0.00K
NORTHVILLE	07/12/2004	08:35	CST	Hail	1.00 in.	0.00K
REDFIELD	07/12/2004	09:50	CST	Hail	0.75 in.	0.00K
BRENTFORD	05/07/2005	18:06	CST	Hail	0.75 in.	0.00K
NORTHVILLE	05/08/2005	14:20	CST	Hail	0.75 in.	0.00K
MELLETTE	06/20/2005	11:05	CST	Hail	0.88 in.	0.00K
TURTON	06/20/2005	11:35	CST	Hail	1.00 in.	0.00K
NORTHVILLE	06/29/2005	12:20	CST	Hail	1.75 in.	0.00K
CONDE	07/08/2005	06:10	CST	Hail	0.88 in.	0.00K
TULARE	08/17/2005	20:33	CST	Hail	0.88 in.	0.00K
DOLAND	08/25/2005	15:30	CST	Hail	0.75 in.	0.00K
TULARE	09/07/2005	22:15	CST	Hail	1.00 in.	0.00K
FRANKFORT	09/07/2005	22:43	CST	Hail	1.00 in.	0.00K
TULARE	09/07/2005	23:37	CST	Hail	0.75 in.	0.00K
CONDE	06/14/2006	05:56	CST	Hail	1.25 in.	0.00K
TURTON	06/14/2006	08:30	CST	Hail	0.75 in.	0.00K
TULARE	06/23/2006	12:01	CST	Hail	1.75 in.	0.00K
REDFIELD	07/27/2006	16:40	CST	Hail	1.00 in.	0.00K
REDFIELD	07/27/2006	16:44	CST	Hail	1.00 in.	0.00K

MANSFIELD	04/20/2007	19:40	CST-6	Hail	0.75 in.	0.00K
BRENTFORD	05/22/2007	16:15	CST-6	Hail	0.75 in.	0.00K
ATHOL	08/08/2007	16:15	CST-6	Hail	1.00 in.	0.00K
ATHOL	08/08/2007	16:15	CST-6	Hail	1.00 in.	0.00K
ATHOL	08/08/2007	16:50	CST-6	Hail	0.88 in.	0.00K
ATHOL	08/08/2007	16:50	CST-6	Hail	0.88 in.	0.00K
ASHTON	08/08/2007	17:10	CST-6	Hail	1.00 in.	0.00K
FRANKFORT	09/20/2007	03:52	CST-6	Hail	0.88 in.	0.00K
BRENTFORD	07/10/2008	06:00	CST-6	Hail	0.75 in.	0.00K
GALLUP	07/16/2008	22:07	CST-6	Hail	1.00 in.	0.00K
CONDE	07/16/2008	22:45	CST-6	Hail	1.00 in.	0.00K
TURTON	08/26/2008	22:55	CST-6	Hail	1.00 in.	0.00K
REDFIELD ARPT	09/28/2008	14:50	CST-6	Hail	0.75 in.	0.00K
SPINK COLONY	09/28/2008	15:45	CST-6	Hail	0.75 in.	0.00K
MANSFIELD	05/31/2009	15:15	CST-6	Hail	1.25 in.	0.00K
CONDE	06/16/2009	14:00	CST-6	Hail	0.75 in.	0.00K
REDFIELD	05/22/2010	21:27	CST-6	Hail	1.75 in.	0.00K
GLENDALE COLONY	07/06/2010	19:30	CST-6	Hail	1.00 in.	0.00K
BLOOMFIELD	07/10/2010	17:15	CST-6	Hail	1.75 in.	0.00K
DOLAND	07/23/2010	18:50	CST-6	Hail	1.75 in.	0.00K
REDFIELD ARPT	09/01/2010	19:40	CST-6	Hail	1.75 in.	0.00K
REDFIELD ARPT	09/01/2010	19:48	CST-6	Hail	1.75 in.	0.00K
TULARE	09/01/2010	19:48	CST-6	Hail	1.75 in.	0.00K
CONDE	05/21/2011	16:55	CST-6	Hail	1.00 in.	0.00K
REDFIELD	08/14/2011	21:59	CST-6	Hail	1.00 in.	0.00K
REDFIELD ARPT	08/14/2011	22:03	CST-6	Hail	1.00 in.	0.00K
REDFIELD	08/14/2011	22:17	CST-6	Hail	1.00 in.	0.00K
TURTON	03/25/2012	16:25	CST-6	Hail	0.75 in.	0.00K

FRANKFORT	05/02/2012	17:05	CST-6	Hail	0.88 in.	0.00K
CONDE	05/02/2012	21:49	CST-6	Hail	0.88 in.	0.00K
CONDE	05/24/2012	15:17	CST-6	Hail	0.75 in.	0.00K
CONDE	05/24/2012	15:25	CST-6	Hail	1.00 in.	0.00K
FRANKFORT	07/12/2012	17:43	CST-6	Hail	1.00 in.	0.00K
REDFIELD	08/03/2012	16:40	CST-6	Hail	1.00 in.	0.00K
DOLAND	08/03/2012	17:08	CST-6	Hail	1.00 in.	0.00K

Like the information provided in previous tables, the information in Table 4.8 was collected from NOAA website and appears to be incomplete. Again, hail is common for this region during the spring, summer, and fall and causes thousands of dollars of damage every year. Unfortunately the total damages for each event are not available but hopefully in the near future a method for collecting this data will evolve so that it can be made available to local governments for mitigation planning.

HIGH/SEVERE WIND

Severe wind events are common in eastern South Dakota. Several times a year the residents of Spink County can expect to experience strong winds in excess of 40 mph. Gusts of wind in excess of 100 mph have also been recorded for the area.

Table 4.9: Spink County 10-year History of High/Severe Winds

Location	Date	Time	Time Zone	Hazard	Magnitude	Damage
SPINK (ZONE)	02/11/2002	14:00	CST	High Wind	53 kts. E	0.00K
SPINK (ZONE)	04/23/2002	20:10	CST	High Wind	52 kts. E	0.00K
SPINK (ZONE)	12/12/2004	06:00	CST	High Wind	50 kts. EG	0.00K
SPINK (ZONE)	03/10/2005	07:00	CST	High Wind	35 kts. MS	0.00K
SPINK (ZONE)	10/26/2008	09:00	CST-6	High Wind	35 kts. ES	0.00K
SPINK (ZONE)	04/13/2010	15:00	CST-6	High Wind	35 kts. ES	0.00K
SPINK (ZONE)	10/26/2010	12:00	CST-6	High Wind	52 kts. EG	0.00K
SPINK (ZONE)	10/07/2011	10:00	CST-6	High Wind	35 kts. ES	0.00K

LIGHTNING

The extent or severity of lightening can range from significant to insignificant depending on where it strikes and what structures are hit. Water towers, cell phone towers, power lines, trees, and common buildings and structures all have the possibility of being struck by lightning. People who leave shelter during thunderstorms to watch or follow

lightening also have the possibility of being struck by lightning. The lightning history for the past 10 years shows zero occurrences listed on the NOAA website. Since lightning is common in this region of the United States and in Spink County it is evident that the information reported in the NOAA website is inaccurate and incomplete. Since no information was provided a table showing location, date, time, and magnitude was not included in the plan. It is reasonable to believe that lightning can occur anywhere in the County.

TORNADOS

The annual risk for intense summer storms is very high. All of Spink County is susceptible to summer storms. Warning time for summer storms is normally several hours, sufficient for relocation and evacuation if necessary. However, tornadoes may occur with little or no warning. Table 4.10 includes the tornado history in Spink County over the course of the past 10 years.

Table 4.10: Spink County 10-year History of Tornados

Location	Date	Time	Time Zone	Hazard	Mag	Damage
REDFIELD	07/29/2003	14:23	CST	Tornado	F0	0.00K
CONDE	06/07/2005	22:05	CST	Tornado	F0	0.00K
DOLAND	07/23/2010	18:50	CST-6	Tornado	EF0	0.00K
TULARE	09/01/2010	19:40	CST-6	Tornado	EF0	0.00K
TULARE	09/01/2010	19:59	CST-6	Tornado	EF0	0.00K
REDFIELD ARPT	08/03/2012	16:45	CST-6	Tornado	EF0	0.00K
CONDE	08/03/2012	17:05	CST-6	Tornado	EF0	0.00K

The information provided in Table 4.10, specifically the tornados reported in Tulare, illustrates how several tornados can occur very close together in the same area. While the 10-year history for Spink County does not indicate that tornados occur very often and when they do the tornados many times do not touch down, or cause any damage; however many of the neighboring counties have had severe damage caused by tornado so it is reasonable to expect that similar tornado events can occur in Spink County.

On June 23, 2002, a powerful supercell thunderstorm produced six tornados from eastern McPherson County and across northern Brown county during the evening hours. The first weak tornado (F0) touched down briefly 6.4 miles northeast of Leola and resulted in no damage. The second tornado (F1) touched down 8.5 miles northeast of Leola and crossed over into Spink County where it dissipated 9 miles northwest of Barnard. This tornado brought down many trees and a barn and caused damage to the siding and the roof of a farmhouse in McPherson County and caused no damage in Brown County. A third weak satellite tornado (F0) occurred following the dissipation of the second tornado and resulted in no damage.

A fourth strong tornado (F3) developed 6 miles west of Barnard and moved east and dissipated 3 miles southeast of Barnard. This tornado brought down some high power lines along with a support tower and tossed a pickup truck 100 yards into a group of trees. The pickup truck was totaled. The tornado caused extensive damage to two farmhouses, several farm buildings, and farm equipment. One farmhouse lost its garage and most of its roof with many trees completely snapped off down low and debarked.

The fifth tornado developed 5 miles southeast of Barnard and became a violent tornado (F4). This tornado caused damage to one farmhouse, several outbuildings, trees, and equipment as it moved northeast and strengthened. The tornado then completely demolished two unoccupied homes, several outbuildings, many trees, along with destroying or damaging some farm equipment before dissipating 7.6 miles northeast of Barnard. Also, a sixth weak satellite tornado (F0) occurred with this violent tornado and caused no damage. This was the first F4 tornado recorded in Brown county and one of few recorded in South Dakota.

The total estimated property loss exceeded a million dollars. This is just one example of the extent and severity of a tornado; however, gathering historical data on tornadoes and thunderstorms is very difficult due to the number of occurrences and unconfirmed reports. Each year, many storms and a few tornadoes affect the county. Summer storms in Spink County usually produce a wide range of damage making damage estimates very difficult. A complete listing of all summer storms having occurred within the county is not possible due to inaccurate reporting. The National Weather Service reports online were the primary source for this information.

EXTREME TEMPERATURES

Extreme temperatures in Spink County are common occurrences. It is expected that at least two times each year there will be extreme heat or extreme cold in the area. The following information was found on the SHELDUS and NOAA websites. It is possible that people in the area have adapted to this type of extreme temperatures and thus such weather events are not reported as often as they occur. It is also possible that the information has only in recent years been tracked or reported. Table 4.11 identifies dates and times of the temperature extremes.

Table 4.11 Spink County 10-year History of Extreme Temperatures

Location	Date	Time	Time Zone	Hazard	Property Damage
SPINK (ZONE)	07/23/2007	12:00	CST-6	Excessive Heat	0.00K
SPINK (ZONE)	07/16/2011	12:00	CST-6	Excessive Heat	0.00K
SPINK (ZONE)	01/29/2008	08:00	CST-6	Extreme Cold/Wind Chill	0.00K
SPINK (ZONE)	02/10/2008	05:00	CST-6	Extreme Cold/Wind Chill	0.00K
SPINK (ZONE)	02/19/2008	21:00	CST-6	Extreme Cold/Wind Chill	0.00K
SPINK (ZONE)	12/15/2008	01:00	CST-6	Extreme Cold/Wind Chill	0.00K

SPINK (ZONE)	12/21/2008	06:00	CST-6	Extreme Cold/Wind Chill	0.00K
SPINK (ZONE)	01/13/2009	21:00	CST-6	Extreme Cold/Wind Chill	0.00K
SPINK (ZONE)	01/07/2010	10:00	CST-6	Extreme Cold/Wind Chill	0.00K
SPINK (ZONE)	02/02/2011	02:00	CST-6	Extreme Cold/Wind Chill	0.00K
SPINK (ZONE)	02/08/2011	05:00	CST-6	Extreme Cold/Wind Chill	0.00K

The location in table 4.11 is not specifically identified in the table by jurisdiction due to the vast area across the State of South Dakota affected by extreme temperatures. On January 13, 2009, after a clipper system dropped from 1 to 4 inches of snow, Arctic air and blustery north winds pushed into the area. The coldest air and the lowest wind chills of the season spread across much of central and northeast South Dakota. Wind chills fell to 35 to 50 degrees below zero late in the evening of the 13th and remained through the 14th and into the mid morning hours of the 15th.

Across northeast South Dakota, wind chills were as low as 60 degrees below zero by the morning of the 15th. Many vehicles did not start because of the extreme cold and several schools had delayed starts. The Arctic high pressure area settled in on the morning of the 15th bringing the coldest temperatures to the region in many years. The combination of a fresh and deep snow pack, clear skies, and light winds allowed temperatures to fall to record levels at many locations on the 15th. Daytime highs remained well below zero across the area.

This was one of the coldest days that most areas experienced since the early 1970s. The records were broken by 1 to as much as 7 degrees. Some of the record lows included, -30 degrees at Kennebec; -31 degrees at Sisseton; -32 degrees at Milbank; -33 degrees at Mobridge; -35 degrees at Andover and near Summit; -38 degrees at Eureka; -39 degrees 8 miles north of Columbia and Castlewood; -42 degrees at Aberdeen; and -47 degrees at Pollock. Some near record low temperatures included, -24 degrees at Pierre; -29 degrees at Redfield and Victor; -32 degrees at Roscoe; and -34 degrees at Watertown. In Aberdeen, the low temperature of -42 degrees tied the third coldest temperature ever recorded. The coldest temperature ever recorded in Aberdeen was -46 degrees. With these types of temperature extremes the biggest concern for people is exposure because prolonged exposure means almost certain death.

The counterpart to extreme cold is extreme heat which also has dangerous implications to humans, livestock, and critical structures and facilities if certain conditions are present. On July 23, 2007, high heat indices along with very little wind contributed to the deaths of over 2800 cattle in Brown, Spink, Day, and Marshall Counties. Most of the cattle deaths occurred on July 23rd. The high heat indices continued through the 25th with some more cattle deaths but protective measures kept the death count down. Most of the cattle that died were on feedlots. The total loss was around 3 million dollars.

Another temperature extreme occurrence took place in July 2006 when record heat and high humidity affected central, north central, and northeast South Dakota. Heat indices rose to 105 to 115 degrees across the area. Record high temperatures were set at Pierre, Mobridge, Kennebec, Timber Lake, and Aberdeen. Aberdeen set a record high of 106 on July 30, 2006.

WINTER STORMS

Table 4.12 shows just how common snow and ice storms are in Spink County. While such storms would be considered extreme in many parts of the Country, the consistent nature of such weather hazards are expected in this area. Thus, planning and response mechanisms for snow and ice storms are vital to the County and are routine procedures in Spink County due to the common nature of such storms.

Table 4.12 Spink County 10-year History of Winter Storms					
Location	Date	Time	Time Zone	Hazard	Damage
SPINK (ZONE)	03/14/2002	07:00	CST	Winter Storm	0.00K
SPINK (ZONE)	02/02/2003	01:00	CST	Winter Storm	0.00K
SPINK (ZONE)	12/29/2005	17:00	CST	Winter Storm	0.00K
SPINK (ZONE)	02/24/2007	07:00	CST-6	Winter Storm	0.00K
SPINK (ZONE)	04/25/2008	06:00	CST-6	Winter Storm	0.00K
SPINK (ZONE)	02/26/2009	02:00	CST-6	Winter Storm	0.00K
SPINK (ZONE)	04/15/2011	02:00	CST-6	Winter Storm	0.00K
SPINK (ZONE)	12/08/2012	13:00	CST-6	Winter Storm	0.00K

Winter storms in South Dakota are known to cover large geographical areas, often an entire county or multiple counties can be affected by a single storm. All of the storms identified in Table 4.12 were considered to have occurred countywide. Due to the multiple occurrences of winter storms each year, an exhaustive compilation is not possible.

Table 4.13 is Spink County's complete Winter Storm History taken from the 2008 PDM Plan. In comparison to the table provided above, it is evident that the information is being reported and recorded more accurately now than in previous decades which is most likely a result of technology, internet, and a coordinated and focused effort to share information between agencies and local governments.

Table 4.13 Spink County Storm Dates 2008 PDM		
Storm	**Date**	**Location**
Wind, Glaze, Frreezing Rain & Ice	Apr-91	County
Blizzard, Wind & Snow	Nov-91	County
Heavy Snow	Nov-93	County
Heavy Snow	Nov-94	County
Heavy Snow	Dec-94	County
Ice & Strong Winds	Jan-95	County
Freezing Rain & Snow	Feb-95	County

Heavy Snow	Mar-95	County
Heavy Snow	Mar-95	County
Heavy Snow	Apr-95	County
Heavy Snow & Strong Winds	Oct-95	County

THUNDERSTORMS

Thunderstorms and high wind occurrences in the County are also very common. Table 4.14 denotes the extent and severity of such hazards. The County continues to educate residents of the dangers of such storms through public service announcements and other printed media.

Table 4.14 Spink County 10-year History of Thunderstorms

Location	Date	Time	Time Zone	Hazard	Mag	Damage
TULARE	06/23/2002	22:30	CST	Thunderstorm	61 kts. E	0.00K
MELLETTE	07/21/2002	02:45	CST	Thunderstorm	65 kts. M	0.00K
CONDE	07/24/2002	23:30	CST	Thunderstorm	52 kts. E	0.00K
REDFIELD	08/11/2002	19:10	CST	Thunderstorm	61 kts. E	0.00K
REDFIELD	07/29/2003	14:10	CST	Thunderstorm	70 kts. EG	0.00K
REDFIELD	07/29/2003	14:20	CST	Thunderstorm	92 kts. MG	0.00K
REDFIELD	07/29/2003	14:45	CST	Thunderstorm	80 kts. EG	0.00K
ATHOL	08/09/2003	16:15	CST	Thunderstorm	52 kts. EG	0.00K
MELLETTE	06/07/2005	21:50	CST	Thunderstorm	61 kts. EG	0.00K
MANSFIELD	06/07/2005	22:00	CST	Thunderstorm	87 kts. EG	0.00K
NORTHVILLE	06/07/2005	22:00	CST	Thunderstorm	87 kts. EG	0.00K
MELLETTE	06/07/2005	22:00	CST	Thunderstorm	89 kts. MG	0.00K
DOLAND	06/29/2005	06:24	CST	Thunderstorm	52 kts. EG	0.00K
NORTHVILLE	06/29/2005	12:20	CST	Thunderstorm	52 kts. EG	0.00K
FRANKFORT	06/29/2005	15:14	CST	Thunderstorm	52 kts. EG	0.00K
REDFIELD	07/02/2005	23:50	CST	Thunderstorm	52 kts. EG	0.00K
MELLETTE	05/29/2006	00:30	CST	Thunderstorm	51 kts. MG	0.00K
TULARE	08/10/2006	19:53	CST	Thunderstorm	61 kts. EG	0.00K
TULARE	08/12/2006	16:30	CST	Thunderstorm	52 kts. EG	0.00K
TULARE	08/18/2006	08:30	CST	Thunderstorm	52 kts. EG	0.00K

CONDE	05/05/2007	18:25	CST-6	Thunderstorm	52 kts. EG	0.00K
GALLUP	05/05/2007	18:55	CST-6	Thunderstorm	61 kts. EG	0.00K
BRENTFORD	06/11/2008	02:15	CST-6	Thunderstorm	52 kts. EG	0.00K
MANSFIELD	07/31/2008	03:02	CST-6	Thunderstorm	61 kts. EG	0.00K
MELLETTE	07/31/2008	03:15	CST-6	Thunderstorm	61 kts. EG	0.00K
MANSFIELD	05/12/2009	21:00	CST-6	Thunderstorm	52 kts. EG	0.00K
TULARE	05/22/2010	03:45	CST-6	Thunderstorm	61 kts. EG	0.00K
MELLETTE	05/24/2010	20:35	CST-6	Thunderstorm	52 kts. EG	0.00K
REDFIELD	07/06/2010	18:10	CST-6	Thunderstorm	52 kts. EG	0.00K
DEITER ARPT	07/06/2010	18:20	CST-6	Thunderstorm	61 kts. EG	0.00K
BLOOMFIELD	07/06/2010	19:30	CST-6	Thunderstorm	70 kts. EG	0.00K
DOLAND	07/23/2010	18:49	CST-6	Thunderstorm	52 kts. EG	0.00K
TULARE	09/01/2010	19:53	CST-6	Thunderstorm	70 kts. EG	0.00K
TULARE	08/02/2011	01:55	CST-6	Thunderstorm	52 kts. EG	0.00K
TULARE	08/02/2011	02:20	CST-6	Thunderstorm	52 kts. EG	0.00K
REDFIELD	08/28/2011	05:46	CST-6	Thunderstorm	61 kts. EG	0.00K
REDFIELD	08/03/2012	16:40	CST-6	Thunderstorm	70 kts. EG	0.00K
GALLUP	08/03/2012	16:44	CST-6	Thunderstorm	70 kts. EG	0.00K
FRANKFORT	08/03/2012	16:55	CST-6	Thunderstorm	61 kts. EG	0.00K
DOLAND	08/03/2012	16:59	CST-6	Thunderstorm	52 kts. EG	0.00K
TURTON	08/03/2012	17:00	CST-6	Thunderstorm	70 kts. EG	0.00K
BRENTFORD	08/03/2012	17:03	CST-6	Thunderstorm	61 kts. EG	0.00K
TURTON	08/03/2012	17:07	CST-6	Thunderstorm	70 kts. EG	0.00K

The 2008 plan listed all significant thunderstorm occurrences in a table including hail and tornado occurrences on record dating back to 1881. In comparison to the table provided above, it is evident that the information is being reported and recorded more accurately now than in previous decades which is most likely a result of technology, internet, and a coordinated and focused effort to share information between agencies and local governments.

ASSESSING VULNERABILITY: OVERVIEW

Requirement §201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

The following paragraphs summarize the description of the jurisdiction's vulnerability to each hazard and the impact of each hazard on the jurisdiction**.**

Blizzards are characterized by high winds, blowing snow, cold temperatures, and low visibility. Blizzards create conditions such as icy roads, closed roads, downed power lines and trees. Spink County's population is especially vulnerable to these conditions because people tend to leave their homes to get places such as work, school, and stores rather than staying inside. Traffic is one of the biggest hazards in Spink County during a blizzard because people often get stuck, stranded, and lost when driving their vehicles which usually prompts others such as family and or emergency responders to go out in the conditions to rescue them.

Drought can be defined as a period of prolonged lack of moisture. High temperatures, high winds, and low relative humidity all result from droughts and are caused by droughts. A decrease in the amount of precipitation can adversely affect stream flows and reservoirs, lakes, and groundwater levels. Crops and other vegetation are harmed when moisture is not present within the soil.

South Dakota's climate is characterized by cold winters and warm to hot summers. There is usually light moisture in the winter and marginal to adequate moisture for the growing season for crops in the eastern portion of the state. Semi-arid conditions prevail in the western portion. This combination of hot summers and limited precipitation in a semi-arid climatic region present a potential position of suffering a drought in any given year. The climatic conditions are such that a small departure in the normal precipitation during the hot peak growing period of July and August could produce a partial or total crop failure. In fact South Dakota's economy is closely tied to agriculture only magnifies the potential loss which could be suffered by the state's economy during drought conditions. Roughly every 50 years a significant drought is experienced within the county, while less severe droughts have occurred as often as every three years.

Earthquakes occur in the area, but have not had a great enough magnitude or intensity in the past 10 years to be reported. The magnitude and intensity of an earthquake is measured by the Richter scale and the Mercalli scale. An earthquake of noteworthy magnitude has not occurred in the County for decades, but it would be reasonable to expect that a large earthquake would have comparative impact on Spink County as it would anywhere else. Spink County does not have skyscrapers or very many tall buildings other than grain elevators, but it also does not have building codes in place that require homes or buildings to be retrofitted. If earthquakes were a regular occurrence in Spink County, the County would be extremely vulnerable because of the lack of building requirements but since the likelihood of an earthquake is minimal, the risk is also considered low.

Extreme Cold temperatures often accompany a winter storm, so you may have to cope with power failures and icy roads. Whenever temperatures drop decidedly below normal and as wind speed increases, heat can leave your body more rapidly. These weather-related conditions may lead to serious health problems. Extreme cold is a dangerous situation that can bring on health emergencies in susceptible people, such as those without shelter or who are stranded, or who live in a home that is poorly insulated or without heat. Exposure is the biggest threat/vulnerability to human life, however, incidences of exposure are isolated and thus unlikely to happen in masses.

Extreme Heat: Severe heat waves have caused catastrophic crop damage, thousands of deaths from hyperthermia, and widespread power failures due to increased use of air conditioning. Loss of power and crop and livestock damage are the largest vulnerability to the county during extreme heat. Both have an effect on quality of life, however, neither are detrimental to the existence of the population of Spink County.

Flooding: Floods can result in injuries and even loss of life when fast flowing water is involved. Six inches of moving water is enough to sweep a vehicle off a road. Disruption of communication, transportation, electric service, and community services, along with contamination of water supplies and transportation accidents are very possible.

The flooding of township and county roads is a concern for the entire county. Concern areas are addressed in the Mitigation Section of this plan.

Freezing Rain causes adverse conditions such as slippery surfaces and extra weight buildup on power lines, poles, trees, and structures. The additional weight can often cause weak structures to cave in and cause tree branches and power lines to break and fall. Spink County and the local jurisdictions within are susceptible to these conditions due to the types of structures and surfaces that exist in the county that can not be protected from freezing rain. Traffic on the roads and highways tend to be the biggest hazard during freezing rain conditions because vehicles often slide off the road which prompts emergency responders and others to have to go out on rescue missions in the adverse conditions.

Hail causes damage to property such as crops, vehicles, windows, roofs, and structures. Spink County and its local jurisdictions are vulnerable to hail, like most other areas in the State due to the nature of the hazard. Mitigating for hail is difficult and is usually found in the form of insurance policies for structures, vehicles, and crops.

Heavy Rain causes damage to property such as homes and roads. Often when heavy rains occur in Spink County it causes sewers to backup in homes due to excess water entering the wastewater collection lines. The excess water sometimes has no place to go and thus basements fill up with water which results in damage to water heaters, furnaces, and damage to living quarters for people who live in basement apartments. Roads and bridges can be washed out, thus causing traffic hazards for travelers and commuters. Many times the roads have to be closed causing rural traffic to have to take alternate routes which can sometimes be an additional 5-10 miles out of the way. All areas of the County are vulnerable when heavy rains occur. Storm sewers are built for the typical storm and therefore do not accommodate for excessive or heavy rains.

Ice Jams cause damage to bridges, roads, and culverts due to water currents pushing large chunks of ice under or through small openings. There are four locations in the County which are at risk of ice jams: at the intersections of Turtle Creek and Highways 24 and 26, and at the intersections of Snake Creek and Highways 19 and 14. There are also many other unspecified areas throughout the county that are vulnerable to ice jams.

Landslides have a low chance of occurring in Spink County due to the relatively flat topography. There is one area of concern along Turtle Creek which runs through the City of Redfield. The embankment has been falling into the creek on the north part of Main Street and one house is mere inches away from sliding into the creek. The erosion worsens every time the City experiences heavy rain. The City of Redfield has hired

Clark Engineering Corporation out of Aberdeen, South Dakota to complete a study of the bank in which several alternatives were outlined to correct the problem. The City has prioritized the bank stabilization project as one of its top priorities, however the project is expensive and the City will need funding assistance in order to be able to complete the project.

Lightning often strikes the tallest objects within the area. In towns trees and poles often receive the most strikes. In rural areas, shorter objects are more vulnerable to being struck. Electrical lines and poles are also vulnerable because of their height and charge. In addition, many streetlights function with sensors. Since thunderstorms occur primarily during hours of darkness, lightning strikes close to censored lights cause the lights to go out, causing a potential hazard for drivers. Flickering lights and short blackouts are not at all uncommon in the county.

One of lightning's dangerous attributes includes the ability to cause fires. Since the entire county is vulnerable to lightning strikes and subsequent fires, these fires will be treated under the fire section of this plan.

Most injuries from lightning occur near the end of thunderstorms. Individuals who sought shelter leave those areas prior to the entire completion of the thunderstorm. Believing it is safe to freely move around, concluding lightning strikes catch them off guard.

Severe Winter Storms have a high risk of occurrence. Approximately five snowstorms each resulting in 5-10 inches of snow occur in the Spink County area annually. Heavy snow can immobilize transportation, down power lines and trees and cause the collapsing of weaker structures. Livestock and wildlife are also very vulnerable during periods of heavy snow. Most storms can be considered to have occurred countywide. Due to the multiple occurrences of winter storms each year, an exhaustive compilation is not possible.

Additionally, winter storms often result in some forms of utility mishaps. High voltage electric transmission/distribution lines run the length of Spink County. These lines are susceptible to breaking under freezing rain and icy conditions and severing during high blizzard winds. Within the county, particularly within Redfield, there are fiber optics associated with phone transmissions that are the lifeline to communications. Any electrical complications bring associated risk of food spoilage, appliance burnout, loss of water, and potential harm for in-house life support users. Limited loss of power is not uncommon on an annual basis. A typical power interruption lasts from 1 to 3 hours. Most residents are prepared to deal with this type of inconvenience.

The greatest danger during winter weather is traveling. Many individuals venture out in inclement weather. Reasons include the necessity of getting to work, going to school, going out just to see how the weather is, and to rescue stranded persons.

Snow Drifts are caused by wind blowing snow and cold temperatures. These drifts can be small finger drifts on roadways causing cautionary driving, or 20-40 foot high drifts that block entire highways, roads, and farmyards for several days.

Populations at highest vulnerability for this type of hazard are rural homeowners, which account for approximately 57 percent of the county, and the elderly. As with any weather event, those dependent upon healthcare supplies and other essentials will also bear the

brunt of highway closures and slowed transportation due to snow and ice. Emergency services will also be delayed during winter storms.

Snow removal policies and emergency response is at excellent performance and no projects will be considered in this area. Generators provide back-up power to many critical facilities within Redfield and in rural areas. However, some of the critical facilities that could be utilized in disaster situations do not have backup generators. Also, some facilities have generators that only power a portion of operations.

Strong Winds can be detrimental to the area. Trees, poles, power lines, and weak structures are all susceptible and vulnerable to strong winds. When strong winds knock down trees, poles, power lines, and structures it creates additional traffic hazards for travelers and commuters. Strong winds are a common occurrence in all parts of Spink County. The farming community tends to be vulnerable because many old farm sites have weak, dilapidated, or crumbling structures or structures such as grain bins which can easily be blown over. Another area of particular vulnerability would be those areas with dense tree growth where dead or decaying trees lose their stability and can be blown over or knocked down easily.

Subsidence is a hazard that has a very low probability of occurring in the area. Therefore the jurisdictions do not consider themselves particularly vulnerable to such a hazard.

Thunderstorms cause lightning and large amounts of rain in a small timeframe. The entire county experiences thunderstorms on a regular basis and is only vulnerable when weather events outside the norm occur. Specific vulnerabilities are further identified in the paragraphs for “Lightning” and “Heavy Rains”.

Tornadoes present significant danger and occur most often in South Dakota during the months of May, June, and July. The greatest period of tornado activity (about 82 percent of occurrence) is from 11 am to midnight. Within this time frame, most tornadoes occur between 4 pm and 6 pm. The annual risk for intense summer storms is very high. Often associated with summer storms are utility problems. High voltage electrical transmission lines run the length of Spink County. These lines are susceptible to breaking during high winds and hail. Tall trees located near electrical lines can be broken in wind or by lightning strikes and land on electrical lines, severing connections. Any electrical complications bring associated risk of food spoilage, appliance burnout, loss of water, and potential harm to in-house life support dependents. Limited loss of power is common on an annual basis. Typical power interruptions last around 1 to 3 hours. Most residents are prepared to deal with this.

Wildfires occur primarily during drought conditions. Wildfires can cause extensive damage, both to property and human life, and can occur anywhere in the county. Even though wildfires can have various beneficial effects on wilderness areas for plant species that are dependent on the effects of fire for growth and reproduction, large wildfires often have detrimental atmospheric consequences, and too frequent wildfires may cause other negative ecological effects. Current techniques may permit and even encourage fires in some regions as a means of minimizing or removing sources of fuel from any wildfire that might develop.

Since there are no remote forested regions in Spink County, wildfires can be easily spotted and are capable of being maintained. Spink County does not have any areas that are considered Wildland-urban interface because property outside city limits is primarily agricultural land, thus, there are no urban interface areas at risk in Spink County. In addition, fire interference with traffic on highways is not a major concern. The most important factor in mitigating against wildfires continues to be common sense and adherence to burning regulations and suggestions disseminated by the County.

Moisture amounts have the biggest impact on fire situations. During wet years, fire danger is low. More controlled burns are conducted and less mishaps occur. During dry years, severe restrictions are placed on any types of burns. For information on dealing with open/controlled burning within the county, see SDCL 34-29B and 34-35.

Hunting season brings thousands of hunters to the area. Shots have the potential to ignite dry grassland, hay bales, or storage areas. This is a risk that is addressed in hunting education and safety.

ADDRESSING VULNERABILTY: REPETITIVE LOSS PROPERTIES
Requirement §201.6(c)(2)(ii): [The risk assessment] must also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged by floods.

Repetitive loss properties are those for which two or more losses of at least $1,000 each have been paid under the National Flood Insurance Program (NFIP) within any 10-year period since 1978. Spink County does not keep an official record of repetitive loss properties however; the State of South Dakota Office of Emergency Management (SDOEM) provided a listing of two properties that qualify as repetitive loss properties. Neither property has been mitigated at this time. One property is located within the City limits of Redfield and the other is located in a rural area within the County. Spink County was working to acquire/relocate one property due to repetitive loss threat which is located near Mellette, however more information is needed to complete the benefit cost analysis for the application to HMGP.

ASSESSING VULNERABILITY: IDENTIFYING STRUCTURES
Requirement §201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area…

One of the primary purposes of this plan is identifying critical facilities, emergency shelters, and summer storm shelters and equipping those facilities with the means to provide the necessary energy for access to sanitation and maintain important functions during a natural hazard occurrence. In the event of a disaster as a result of severe summer or winter storms, a terrorist attack, or a hazardous materials incident, Spink County and participating entities will have the ability to prevent further loss of life by generator powered critical facility shelters. The City of Redfield has many structures that are vital to emergency operations. Table 4.15 is a list of critical facilities that would cause the greatest distress in the county if destruction occurred. Approximate dollar values are also listed.

(INSERT TABLE 4.15 CRITICAL FACILITIES)

The information provided in Table 4.15 was taken from the Homeland Security Document that is completed and updated by the County each year.

ASSESSING VULNERABILITY: ESTIMATING POTENTIAL LOSSES

Requirement §210.6(c)(2)ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate…

The information provided in the following tables was collected from the local jurisdictions by the representatives from each community. The Spink County Emergency Manager provided the information for Spink County and representatives from the private participating businesses as well as the local jurisdictions provided information regarding their vulnerabilities. Inconsistencies and missing information result from lack of existing mechanisms, plans, and technical documents available to the communities and also a result of people who are serving their communities on a volunteer basis as opposed to many other areas in the nation which have larger communities who pay salaried professionals to represent them during the PDM drafting process. Each of the communities provided the best available data considering the lack of resources in which to access the information. Since this section of the plan is new, those jurisdictions that have submitted incomplete information in the 2013 PDM Plan will be requested to provide more complete data during the next five-year update and review of the Plan.

The assessor's office provided the assessed valuation of properties within the municipalities. All properties with structures, whether owner occupied or not were included in the valuations provided in Tables 4.16 through 4.26. Tables 4.27 through 4.28 represent private partners of the PDM and thus they provided their own information. The reports provided by the assessor's office did not include the number of structures or the number of people in each structure; thus, many of the tables are missing this information. Those tables that do have number of structures or number of people listed are a result of the municipalities providing the information. Some of the communities (local jurisdictions) can literally count every structure and every resident from their doorstep, which shows just how small and rural some of these communities are.

4.16 Spink County Estimated Potential Dollar Losses to Vulnerable Structures

Type of Structure	Number of Structures			Value of Structures			Number of People		
	# in County	# in HA	% in HA	$ in County	$ in HA	% in HA	# in County	# in HA	% in HA
Residential	3122	3122	100%	$122,936,468	$122,936,468	100%	6415	6415	100%
Commercial	408	408	100%	$30,468,815	$30,468,815	100%			
Industrial									
Agricultural	1334	1334	100%	$14,723,780	$14,723,780	100%			
Religious	26	26	100%	unknown					
Government	37	37	100%	unknown					
Education	4	4	100%	unknown					
Utilities									
Total	**4931**	**4931**	**100%**	**$153,405,283+**	**$153,405,283+**	**100%**	**6415**	**6415**	**100%**

4.17 Ashton Estimated Potential Dollar Losses to Vulnerable Structures									
Type of Structure	Number of Structures			Value of Structures			Number of People		
	# in City	# in HA	% in HA	$ in City	$ in HA	% in HA	# in County	# in HA	% in HA
Residential	70	70	100%	$1,714,623	$1.714M	100%	122	122	100%
Commercial	11	11	100%	$180,386	$180,386	100%			
Industrial	0	0		0	0				
Agricultural	0	0		0	0				
Religious	0	0		0	0				
Government	2	2	100%	$100,000	$100,000	100%			
Mobile Homes	8	8	100%	$49,663	$49,663				
Utilities									
Total	**91**	**91**	**100%**	**$2,044,672**	**$2,044,672**	**100%**	**122**	**122**	**100%**

4.18 Brentford Estimated Potential Dollar Losses to Vulnerable Structures									
Type of Structure	Number of Structures			Value of Structures			Number of People		
	# in City	# in HA	% in HA	$ in City	$ in HA	% in HA	# in City	# in HA	% in HA
Residential	38	38	100%	1,000,000	1,000,000	100%	77	77	100%
Commercial	3	3	100%	400,000	400,000	100%			
Industrial									
Agricultural									
Religious	1	1	100%	70,000	70,000	100%			
Government									
Education									
Utilities	1	1		600,000					
Total	**43**	**43**	**100%**	**$2,070,000**	**$2,070,000**	**100%**	**77**	**77**	**100%**

4.19 Conde Estimated Potential Dollar Losses to Vulnerable Structures									
Type of Structure	Number of Structures			Value of Structures			Number of People		
	# in City	# in HA	% in HA	$ in City	$ in HA	% in HA	# in City	# in HA	% in HA
Residential	127	127	100	$3,375,000	$3,375,000	100	140	140	100%
Commercial	8	8	100	$443,591	$443,591	100			
Industrial	0	0	0	0	0	0			
Agricultural	1	1	100	$142,979	$142,979	100			
Religious	1	1	100	$632,400	$632,400	100			
Government	11	11	100	$3,300,000	$3,300,000	100			
Education	0	0	0	0	0	0			
Utilities									
Total	**148**	**148**	**100%**	**$7,893,970**	**$7,893,970**	**100**	**140**	**140**	**100%**

4.20 Doland Estimated Potential Dollar Losses to Vulnerable Structures									
Type of Structure	Number of Structures			Value of Structures			Number of People		
	# in City	# in HA	% in HA	$ in City	$ in HA	% in HA	# in City	# in HA	% in HA
Residential							180	180	
Commercial									
Industrial									
Agricultural									
Religious									
Government									
Education									
Utilities									
Total									

4.21 Frankfort Estimated Potential Dollar Losses to Vulnerable Structures									
Type of Structure	Number of Structures			Value of Structures			Number of People		
	# in City	# in HA	% in HA	$ in City	$ in HA	% in HA	# in City	# in HA	% in HA
Residential	90	90	100%	2,787,000	2,787,000	100%	149	149	100%
Commercial	1	1	100%	unknown					
Industrial									
Agricultural	2	2	100%	unknown		100%	2	2	100%
Religious	1	1	100%	100,000	100,000	100%	25	25	100%
Government	1	1	100%	unknown		100%	2	2	100%
Education									
Utilities									
Total	**95**	**95**	**100%**	**$2,887,000+**	**$2,887,000**	**100%**	**178**	**178**	**100%**

4.22 Mellette Estimated Potential Dollar Losses to Vulnerable Structures									
Type of Structure	Number of Structures			Value of Structures			Number of People		
	# in City	# in HA	% in HA	$ in City	$ in HA	% in HA	# in City	# in HA	% in HA
Residential							130	130	100%
Commercial									
Industrial									
Agricultural									
Religious									
Government									
Education									
Utilities									
Total									

4.23 Northville Estimated Potential Dollar Losses to Vulnerable Structures									
Type of Structure	Number of Structures			Value of Structures			Number of People		
	# in City	# in HA	% in HA	$ in City	$ in HA	% in HA	# in City	# in HA	% in HA
Residential	59	17	29%	$5,605,000	1,600,000	29%	143	39	27%
Commercial	3	1	33%	unknown		33%			
Industrial									
Agricultural	2	0		$6,300,000					
Religious	1	1	100%	$120,000	$120,000				
Government	1	1	100%	$50,000	$50,000				
Education									
Utilities									
Total	66	66		$12,075,000	$1,770,000+		143	39	27%

4.24 Redfield Estimated Potential Dollar Losses to Vulnerable Structures									
Type of Structure	Number of Structures			Value of Structures			Number of People		
	# in City	# in HA	% in HA	$ in City	$ in HA	% in HA	# in City	# in HA	% in HA
Residential	918	918	100%	$47,618,060	$47,618,060	100%	2,333	2,333	100%
Commercial	187	187	100%	$18,915,376	$18,915,376	100%			
Industrial									
Agricultural									
Religious									
Government	66	66	100%	$27,587,257	$27,587,257	100%			
Education	4	4		$10,027,000	$10,027,000	100%			
Utilities									
Total	**1,175**		**100%**	**$104,147,693**	**$104,147,693**	**100%**	**2,333**	**2,333**	**100%**

4.25 Tulare Estimated Potential Dollar Losses to Vulnerable Structures									
Type of Structure	Number of Structures			Value of Structures			Number of People		
	# in City	# in HA	% in HA	$ in City	$ in HA	% in HA	# in City	# in HA	% in HA
Residential	89	89	100				207	207	100
Commercial	16	16	100						
Fire Dept									
Agricultural									
Religious	5	5	100						
Government	4	4	100						
Education	3	3	100						
Utilities	1	1	100						
Total	**118**	**118**	**100%**				**207**	**207**	**100%**

4.26 Turton Estimated Potential Dollar Losses to Vulnerable Structures									
Type of Structure	Number of Structures			Value of Structures			Number of People		
	# in City	# in HA	% in HA	$ in City	$ in HA	% in HA	# in City	# in HA	% in HA
Residential							48	48	
Commercial									
Industrial									
Agricultural									
Religious									
Government									
Education									
Utilities									
Total							**48**	**48**	

4.27 Redfield Energy Estimated Potential Dollar Losses to Vulnerable Structures									
Type of Structure	Number of Structures			Value of Structures			Number of People		
	# in City	# in HA	% in HA	$ in City	$ in HA	% in HA	# in City	# in HA	% in HA
Residential									
Commercial	40	40	100%	100,000,000+	100,000,000+	100%	42	42	100%
Industrial									
Agricultural									
Religious									
Government									
Education									
Utilities									
Total	**40**	**40**	**100%**	**$100,000,000**	**100,000,000+**	**100%**	**42**	**42**	**100%**

4.28 SDDC Estimated Potential Dollar Losses to Vulnerable Structures									
Type of Structure	Number of Structures			Value of Structures			Number of People		
	# in City	# in HA	% in HA	$ in City	$ in HA	% in HA	# in City	# in HA	% in HA
Residential									
Commercial									
Industrial									
Agricultural									
Religious									
Government	28	28	100%	Unknown	Unknown	100%	140	140	100%
Education									
Utilities									
Total	**28**	**28**	**100%**	**Est. $10M +**			**140**	**140**	**100%**

ASSESSING VULNERABILITY: ANALYZING DEVELOPMENT TRENDS
Requirement §201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

The land use and development trends for each jurisdiction were identified by the representatives from each of the jurisdictions. None of the communities in Spink County are experiencing any growth at this time are as all of the jurisdictions have experienced declining populations over the past 10 years and at this time are just trying to maintain the population they have. Additionally, most of the jurisdictions are not developing with the exception of Redfield where there has been some change in the local businesses over the past 5 years. Due to the declining populations the smaller jurisdictions do not maintain plans for growth and development.

UNIQUE OR VARIED RISK ASSESSMENT
Requirement §201.6(c)(2)(iii): For multi-jurisdictional plans, the risk assessment must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

After conducting the risk assessment for each jurisdiction, the group decided that all areas of the county have an equal chance of a natural hazard occurrence in their area. While the extent to which each jurisdiction is affected by such hazards varies slightly between the local jurisdictions, the implications are the same. Thus the steering committee decided that all jurisdictions in Spink County, with the exception of Redfield because of its proximity to the dams and Turtle Creek, are equally affected by the types of hazards/risks that affect the PDM jurisdiction. Thus, the unique or varied risk requirement is not applicable to the Spink County PDM Plan.

V. MITIGATION STRATEGY

CHANGES/REVISIONS TO THE MITIGATION SECTION:

Additional projects submitted by individual communities were added at the end of the mitigation section as well as Project #6 and #7 under Section I Mitigation Activities for Summer Storms. Several projects were eliminated due to completion and/or reconsideration by the Steering Committee. Those projects are identified under their original Project #.

MITIGATION REQUIREMENTS

Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Requirement §201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard with particular emphasis on new and existing buildings and infrastructure.

MITIGATION OVERVIEW

The State Hazard Mitigation Plan addresses several mitigation categories including warning and forecasting, community planning, and infrastructure reinforcement. Spink County and participating entity's greatest needs are mitigating flood hazards, backup generators for critical infrastructure and storm shelters, and public awareness.

After meetings with the local jurisdictions and opportunities for public input, a series of mitigation goals were devised to best aid the County in reducing and lessening the effects of hazards. Projects previously identified in the 2008 PDM were carefully analyzed and discussed to determine which of the projects had enough merit to be included in the updated plan and to determine if the projects meet the hazard mitigation needs of the county. These projects were evaluated based on a cost/benefit ratio and priority. A *high* priority classification means that the project should be implemented as soon as possible and would minimize losses at a very efficient rate. A *moderate* classification means that the project should be carefully considered and completed after the high priority projects have been completed. A *low* priority means that the project should not be considered in the near future. However, it is a potential solution and should not be eliminated until further evaluation can be completed. Such projects may be completed in light of failures of all other projects striving toward the same goal.

A timeframe for completion, oversight, funding sources, and any other relevant issues were addressed. These implementation strategies are geared toward the specific goal and area. Often, these projects will not encounter any resistance from environmental agencies, legal authorities, and political entities. Where these are a concern, address is made.

SPINK COUNTY MITIGATION ACTIVITIES FOR FLOODING HAZARDS

Goal #1: Reduce the impact of flooding in Spink County

Project #1: County Road 15 improvements (T117N R64W Sec. 23 & 24). There has been a loss of this road due to the erosion of the river bank. The bridge is the only bridge between Ashton and Redfield that will hold the regular traffic and is therefore vital to both communities. The goal of the project is to stop the erosion of the bank on the north side of the road and to build up the bank. Total length of the project is 700 to 800 feet.

Priority:	High
Funding Sources:	County, State, FEMA
Timeframe:	ASAP
Oversight:	County
Cost:	The cost of building up the road and shoulders would be around $45,000. There would need to be a traffic flow study done to determine exactly how much the road is utilized and how the improvements should be carried out.

Project #2: Improve bridges throughout the county. The following is a list of bridges that are graded as structurally or functionally deficient (Having a sufficiency rating of 50.00 or lower).

Bridge ID#	Facility Carried	Sufficiency Rating
58018150	163rd St.	19.20
58062270	175th St.	21.30
58011010	149th St.	22.30
58284160	164th St.	22.40
58060158	382nd Ave.	22.60
58025370	185th St.	24.40
58091180	166th St.	26.80
58051310	179th St.	27.30
58029170	165th St.	29.90
58296380	186th St.	29.90
58124140	162nd St.	30.40
58280394	404th Ave.	31.00
58010376	375th Ave.	32.90
58061080	156th St.	32.90
58023390	187th St.	33.50
58280159	404th Ave.	33.90
58270319	403rd Ave.	34.90
58050330	379th Ave.	35.50
58117190	167th St.	35.80
58323060	154th St.	35.80
58052070	155th St.	36.70
58060075	382nd Ave.	36.90
58018030	151st St.	38.60
58109240	172nd St.	38.90
58019030	151st St.	39.10
58061140	162nd St.	40.00

58031230	171st St.	40.50
58220375	398th Ave.	41.00
58270148	403rd Ave.	41.90
58250190	167th St.	42.20
58021400	188th St.	42.90
58030259	377th Ave.	42.60
58290388	405th Ave.	43.00
58239250	173rd St.	43.50
58275100	158th St.	44.60
58218360	184th St.	44.60
58050340	379th Ave.	44.90
58305370	185th St.	45.50
58252170	165th St.	46.10
58029050	153rd St.	46.20
58280325	404th Ave.	46.20
58120231	388th Ave.	47.60
58020164	376th Ave.	48.60

A study will need to be done to determine the exact benefit of each bridge reconstruction or improvement. Traffic flows, proximity to towns, and age must all be taken into consideration. Costs will vary from $5000 per bridge for simple improvement to $50,000 for complete reconstruction of larger bridges.

Project #3: Clean out the James River and its tributaries. A study should be conducted to determine areas in which debris and earth build up causing the river to backup and flood land. While dredging projects run into a lot of problems regarding environmental issues, studies which can be used to determine valuable projects that are fairly easily conducted.

Priority:	Low
Funding Sources:	County, State, Federal, JRWDD
Timeframe:	Several years
Oversight:	Army Corps of Engineers
Cost/	A study would be fairly cost effective to complete and would serve as a basis for projects. An actual dredging could cost over $1,000,000. A cost/benefit would be conducted with the study.

Project #4: Use HAZUS software to determine flood risk throughout the county.
A minimal cost would be incurred in purchasing the correct software; however office time spent would be more costly. This office time would include analysis and practical application of the data gathered. Funding of approximately $1,500 should serve the purpose of analyzing level 1 flood data. More detailed level 2 and 3 data would require considerable more time, but would serve the County well. A cost of $10,000 would provide ample time to compile more detailed flood data for specific portions of the county

SPINK COUNTY MITIGATION ACTIVITIES FOR SUMMER STORM HAZARDS

Goal #1: Reduce the impact of severe summer storms in the County

Project #1: Construct storm shelters wherever needed throughout the county and place signage along major thoroughfares where travelers can see the locations of the nearest shelters.

Project #2: Evaluate existing shelters and other structures, such as schools, to determine usefulness (and accessibility) as community shelters. Retrofitting these facilities should be considered. Although it does not appear that any currently existing buildings, particularly in the smaller communities, are sufficient to serve as shelters. Retrofitting old schools and other like buildings should be considered if sufficient cost savings justifies the project over building new.

Project #3: Update Siren System throughout the County to include replacing sirens in the towns of Ashton, Doland, Mellette, Northville, Brentford, Turton.

Priority:	High
Funding Source:	County/HMGP
Timeframe:	Project is currently in progress
Oversight:	Spink County Emergency Manager
Cost:	$181,000

Project #4: Removed from plan due to completion.

Project #5: Removed from plan due to completion.

Project #6: Protect the public from summer storms through information and education. With existing and newly developed education materials, the public can be warned of the dangers of summer storms. Book covers, magnets, and brochures have been disseminated through severe weather campaigns. News releases and emergency checklists are also other options.

Some of the issues that may be addressed within the information would include: safety issues on downed power lines, electrical and fire dangers, the necessity for generators and advice on using them, survival strategies during storms, and purchasing of back-up power for various household and farming operations. There should also be information regarding the construction of safe rooms in new and existing houses and the designation/recognition of the safest places within houses during severe weather.

Discussion: This project is not mitigation, while it is good measure to ensure people are educated and informed this activity falls under the category of preparedness.

Project #7: Use HAZUS software to estimate losses particularly for tornados.

A minimal cost would be incurred in purchasing the correct software; however office time spent would be more costly. This office time would include analysis and practical application of the data gathered. Funding of approximately $1,500 should serve the purpose of analyzing basic datasets. Data analysis specific to homes and businesses would require considerable more time, but would serve the County and participating entities well. A cost of $10,000 would provide significant time to analyze more detailed cost-benefit data for specific portions of the county

MITIGATION ACTIVITIES FOR DAM FAILURE

After the floods of 1997 in Spink County, a Mitigation Project to remove all houses in Vinegar Flat was completed. The houses were purchased and removed from the hazard area. This addressed the main concern of the houses below the Redfield Dam being flooded. Since then, no mitigation projects concerning the high hazard dam have been necessary. In an effort to remain proactive, below are the goals for the Redfield Dam:

Goal #1: Reduce the impact of dam failure for citizens located below the dam.

Project #1: Work with Game, Fish and Parks to create a Planning Committee to review and update or rewrite the Redfield Dam Emergency Preparedness Plan and include Cemetery Dam.

Priority:	Moderate
Funding Sources:	Game, Fish and Parks; County; State; FEMA
Timeframe:	3-5 Years
Oversight:	Game, Fish and Parks; Spink County
Cost:	Unknown

Project #2: Check the dam levies and ensure that they are working properly and make any necessary repairs.

Priority:	Moderate
Funding Sources:	Game, Fish and Parks; County; State; FEMA
Timeframe:	3-5 Years
Oversight:	Game, Fish and Parks
Cost:	Unknown

Project #3: Work with Game, Fish and Parks to complete an analysis of the Redfield reservoir dam failure inundation area in order to better understand the risk downstream from the dam.

Priority:	Moderate
Funding Sources:	Game, Fish and Parks; County; State; FEMA
Timeframe:	3-5 Years
Oversight:	Game, Fish and Parks
Cost:	Unknown

MITIGATION ACTIVITIES FOR WINTER STORM HAZARDS

Goal #1: Reduce the impact of severe winter storms on the citizens of Spink County. (submitted by Northern Electric)

Project #1: Mitigate utility mishaps by upgrading utility lines.

There are three identified areas with this project.
1. Advise utility companies of future construction projects.
2. Burial of utility lines.
3. Require upgrading of overhead lines when age or disaster provides opportunity.

Specific upgrades that could help Spink County and participating entities reduce the risk of utility mishap in any situation are as follows:

Guy wires: guy wires are normally attached to dead-end poles. By increasing the wire strength or adding guys to poles that are not dead-end poles, strength and durability during adverse weather is increased.

Power anchors: power anchors provide guy wires a stronger connection/tie to the material it is attached to.

Dead-end poles: by using additional dead-end poles, reliability will be increased.

Cross arms: the use of cross arms can provide a fuse type link in power line construction. These arms will fail before the pole or conductor would. Ideally, when the cross arms fail the conductor will fall without damaging the pole. Specially designed laminated cross arms could provide for even greater security.

Anti-galloping devices: reduce power line galloping induced by high winds. These should be used in conjunction with other measures, since pole failure risk increases with the use of anti-galloping devices.

T2 conductors: designed to limit ice build-up and wind effects on lines.

Pole testing: current pole strength code. All poles should be updated to meet the current requirements.

Specific projects identified thus far are listed below:

- *Project A*: 5.5 miles of overhead single phase line convert to three phase overhead and underground feeder to better serve customers in the area. Project is in T 117 R 60 Sec. 27,28,29,34, & 35

- *Project B*: 18.5 miles of overhead single phase line convert to single phase underground feeder line. Project in T116 R 65 Sec.5, 6 ,7, 8, 9, 10, 11, 13, 15, 17, 20, 21, 23, 24.

- *Project C*: 4.5 miles of three phase and single phase line converted to three phase underground feeder line. Project is in T 116 R 64 Sec. 5, 8, 17, 21.

Priority: Moderate
Funding Sources: Private enterprises, utility companies, State/Federal
Timeframe: 5 years
Oversight: Appropriate electrical companies
Cost: Burial of utility lines is not cost effective; therefore upgrading existing lines would be most efficient. Utility upgrades would range from several hundred dollars to hundreds of thousands of dollars. After damage from storms or replacement of old poles and lines, upgrades need to be considered. Each company must determine what costs are present and determine what is in the best interest of the citizens. There is no authority to mandate this action for a regional basis.

Project #2: Survey areas in need of snow shelterbelts and plant trees accordingly.

Priority: Low-Moderate
Funding Sources: FLEP, Tree City, County, Private
Timeframe: 5 years
Oversight: Forestry Service/Cities
Cost: A survey of needy areas would require minimal cost. A typical shelterbelt would cost several thousand dollars. The locations of structures and persons within the affected area should be included in the survey and a definite cost/benefit analysis must be conducted. Shelterbelts could benefit for rural and semi-urban areas of the county.

MITIGATION ACTIVITIES FOR WILDFIRES/DROUGHT

Goal #1: Reduce the impact of wildfires and drought

Project #1: This project was not mitigation and therefore removed from the plan.

Project #2: Continue to receive assistance from rural homeowners trained in fire fighting and who have water tanks and other useful fire-fighting tools. **Discussion:** This project is preparedness and response, not mitigation but is important to the county and its citizens so it is being left in the plan.

Project #3: Well field development. More wells and availability of water means better sanitation, better fire fighting capabilities, and more water for homeowners during droughts. Environmental issues should be taken into consideration and appropriate actions taken as soon as possible during the process.

Project #4: Have rural fire departments locate dry fire hydrants.

Project #5: Removed from plan
Project #6: Removed from plan

Discussion: Projects #5 and #6 are common sense and already regulated by City and County ordinance, therefore should be removed from plan.

Project #7: Work with the State Forester to complete a wildlife risk assessment and to create a wildlife risk map.

Priority:	Low
Funding Sources:	Undetermined
Timeframe:	T.B.D.
Oversight:	State Forester, Spink County
Cost:	Has yet to be determined

MITIGATION ACTIVITIES FOR MAN-MADE HAZARDS

Discussion: This section of the plan was eliminated due to none of the projects being mitigation of natural hazards.

CITY OF ASHTON MITIGATION GOALS AND ACTIONS

Goal #1: Reduce the impact of fire/wildfire hazard within the City of Ashton

Project #1: The City of Ashton has an underground cistern that is 32 feet in diameter and 12 feet deep. The cistern used to be the City's source of drinking water but is now only being used to fill the fire trucks as the rest of the City is served by rural water. The Cistern is the only source of water the City has to fill the fire trucks and the fire trucks are the only fire protection the City has as there are no fire hydrants in the City. The cement cistern is very old as the original well was built in the early 1900's and then reconstructed in 1956. The well is fed by an underground aquifer. The city is concerned that the cistern could collapse due to its old age and because it has been compromised by the growth of tree roots on all sides. There is an opening in the top of the cistern that is not covered. The opening is about 3 feet by 3 feet and the city is concerned that someone could fall into the cistern. The City is also concerned that heavy snow fall, strong winds, could cause the top of the cistern to collapse which again would leave the City without fire protection. This project is the City's top priority at this time and they have started the process of securing funding for the project. The City has a cost estimate provided by an engineer in the amount of $121,400 for replacing the cistern. The cost includes removing and disposing the old cistern cover, removing and disposing nearby outbuildings to make room for construction of a new concrete water storage inside the old one, constructing a roof for water storage, installing pipes, pumps, and controls, and engineering, design, and bidding.

Goal #2: Reduce the impact of severe storms on the community

Project #1: Install a siren system to warn people of tornado and severe weather. The City is currently in the process of securing funds for installing the sirens. This project will likely be completed in 2013.

CITY OF BRENTFORD MITIGATION GOALS AND ACTIONS

Goal #1: Reduce the impact of severe storms on the community

Project #1: Construct storm shelter in the Town of Brentford. The Town of Brentford would need to be surveyed to determine the precise need for size and location of a shelter (i.e. How many residents would use or need the shelter). See Addendum O for a proposed location. There is currently no existing building within the city that is suitable or feasible to renovate. A preliminary cost estimate would be $25,800*. Brentford's population is 77. An engineer cost of $2,000 would also be incurred in determining the size and location.

CITY OF CONDE MITIGATION GOALS AND ACTIONS

Goal #1: Reduce the impact of flooding within the community

Project #1: Install a stationary standby generator to operate the lift station if power is lost to prevent sewage from backing up into homes.

Project #2: Inspect culverts and determine if replacements are needed for proper flow.

Goal #2: Reduce the impact of severe summer storms

Project #1: Construct storm shelter in the City of Conde. The City of Conde would need to be surveyed to determine the precise need for size and location of a shelter (i.e. How many residents would use or need the shelter). See Addendum O for a proposed location. There is currently no existing building within the city that is suitable or feasible to renovate. A preliminary cost estimate would be $56,400*. Conde's population is 187. An engineer cost of $2,000 would also be incurred in determining the size and location.

CITY OF DOLAND MITIGATION GOALS AND ACTIONS

Doland did not participate in the PDM plan update and thus will not be adopting the plan at this time, however, they have adopted the plan in the past and therefore the projects they submitted in previous years were left in the plan. Doland will have the opportunity to formally adopt the plan during the annual PDM plan update and they can modify their mitigation goals and actions at that time if they are interested.

Goal #1: Reduce the impact of severe winter and summer storms

Project #1: Construct storm shelter in the City of Doland. The City of Doland would need to be surveyed to determine the precise need for size and location of a shelter (i.e. How many residents would use or need the shelter). See Addendum O for a proposed location. There is currently no existing building within the city that is suitable or feasible to renovate. A preliminary cost estimate would be $89,400*. Doland's population is 297. An engineer cost of $2,000 would also be incurred in determining the size and location.

CITY OF FRANKFORT MITIGATION GOALS AND ACTIONS

Goal #1: Reduce the impact of severe winter/summer storms on the community

Project #1: Construct storm shelter in the City of Frankfort. The City of Frankfort would need to be surveyed to determine the precise need for size and location of a shelter (i.e. How many residents would use or need the shelter). See Addendum O for a proposed location. The City has discussed rebuilding the entrance to the City Office building. This is a historic building built in the early 1900's with a basement under it that could be used as a storm shelter if there was a separate, outside access to the space. A preliminary cost estimate would be $50,400*. Frankfort's population is 168. An engineer cost of $2,000 would also be incurred in determining the size and location.

Project #2: Purchase generators for emergency shelters and lift stations. Emergency shelters do not have generators in many cases. Generators suitable for this project would cost approximately $10,000 - $20,000 each. Though this cost is high, the ability for shelters to serve their purpose, persons to have continued access to sanitation, and critical facilities to maintain their function is important. A more detailed benefit analysis should be run before the actual purchasing of generators, to determine sizes needed, best locations, and other facilities that have a high necessity.

Goal #2: Reduce the impact of flood hazard within the City

Project #1: Investigate the existing storm sewer lines and make improvements where the lines have been compromised.

Project #2: Improve the flow of water by inspecting culverts and determining if replacements are needed for proper flow.

Goal #3: Reduce the impact of wildfire and structural fires within the City

Project #1: Improve fire protection by determining if fire hydrants can be installed throughout the City.

CITY OF MELLETTE MITIGATION GOALS AND ACTIONS

Mellette did not participate in the PDM plan update, however, they have adopted the plan in the past and therefore the projects they submitted in previous years were left in the plan. Mellette will have the opportunity to formally adopt the plan during the annual PDM plan update and they can modify their mitigation goals and actions at that time if they are interested.

Goal #1: Reduce the impact of severe storms on the community

Project #1: Construct storm shelter in the City of Mellette. The City of Mellette would need to be surveyed to determine the precise need for size and location of a shelter (i.e. How many residents would use or need the shelter). See Addendum O for a proposed location. There is currently no existing building within the city that is suitable or feasible to renovate. A preliminary cost estimate would be $74,400*. Mellette's population is 248. An engineer cost of $2,000 would also be incurred in determining the size and location.

CITY OF NORTHVILLE MITIGATION GOALS AND ACTIONS

Goal #1: Reduce the impact of flooding on the community

Project #1: Construct the drainage ditch on the west side of town and increase the size of culverts along Hwy 20 to prevent flooding of homes on South and West side of town.

Project #2: Replace storm sewer line on Elm Street due to old age (this is also the outlet for overflow of artesian well which feeds the fire department supply tanks).

CITY OF REDFIELD MITIGATION GOALS AND ACTIONS

Goal #1: Reduce the impact of heavy rains and flooding on the community

Project #1: Complete the Turtle Creek Embankment projects that are identified in the Turtle Creek Bank Stabilization Study. (Appendix F).

Project #2: Inspect storm sewers and determine if repairs or additional or larger pipe is necessary.

Goal #2: Reduce the effects of severe storms (winter and summer) within the City

Project #1: Purchase generators for emergency shelters and lift stations. Emergency shelters do not have generators in many cases. This project is currently in the process of being funded and will likely be completed in 2013.

CITY OF TULARE MITIGATION GOALS AND ACTIONS

Goal #1: Reduce the effects of severe storms (winter and summer) within the City

Project #1: Construct storm shelter in the Town of Tulare. The City of Tulare would need to be surveyed to determine the precise need for size and location of a shelter (i.e. How many residents would use or need the shelter). See Addendum O for a proposed location. There is currently no existing building within the city that is suitable or feasible to renovate. A preliminary cost estimate would be $66,600*. Tulare's population is 221. An engineer cost of $2,000 would also be incurred in determining the size and location.

Goal #2: Reduce flood hazard in the City

Project #1: Inspect culverts throughout town to determine if resizing or relocation is necessary to improve flow. The City park has low lying areas that get flooded

CITY OF TURTON MITIGATION GOALS AND ACTIONS

Turton did not participate in the PDM plan update, however they have adopted the PDM in previous years. Their mitigation strategy has been left in the plan and Turton will have the opportunity to modify this section of the plan if they choose to adopt the plan during the annual update.

Goal #1: Reduce the impact of severe storms on the community

Project #1: Construct storm shelter in the Town of Turton. The Town of Turton would need to be surveyed to determine the precise need for size and location of a shelter (i.e. How many residents would use or need the shelter). See Addendum O for a proposed location. There is currently no existing building within the city that is suitable or feasible to renovate. A preliminary cost estimate would be $18,600*. Turton's population is 61. An engineer cost of $2,000 would also be incurred in determining the size and location.

REDFIELD ENERGY MITIGATION GOALS AND ACTIONS

Goal #1: Reduce impact of severe storms:
Project #1: Upgrade communication systems (switching analog radios to digital) purchase additional handheld radios, add a battery backup to repeater so radio communication would not be lost in the event of a power outage. Install warning siren or intercom system to alert personnel without a radio. Cost $2,000 - $5,000

Goal #2: Reduce the likelihood of manmade hazards:

Project #1: Build up the north entrance road into the plant to allow emergency response vehicles an alternate route to access the facility in the event of a chemical spill or fire. And/or purchase additional containment boom. Cost $5,000 - $10,000

Goal #3: Protect critical infrastructure from heavy rain and flooding hazards:

Project #1: Purchase larger air pumps to pump storm water from containment areas. Cost $5,000

SDDC MITIGATION GOALS AND ACTIONS

Goal #1: Protect critical infrastructure from natural hazards

Project #1: Construct storm shelter for the Horizon Homes structure. There are 6 people with special needs and one staff residing in the structure. Cost estimate, not including engineering fees would need to be figured using a quote process instead of the cost estimate formula from the Mitigation project list due to the low population of the structure.

Project #2: Construct a storm shelter for the Transitional Home. There are 3 people with special needs and one staff residing in the structure. Cost estimate, not including engineering fees would need to be figured using a quote process instead of the cost estimate formula from the Mitigation project list due to the low population of the structure.

Project #3: Construct storm shelter for the Damm/Norgello buildings. . There are 33 people with special needs and 12 staff residing in the structure. Cost estimate, not including engineering fees would need to be figured using a quote process instead of the cost estimate formula from the Mitigation project list due to the low population of the structure.

NATIONAL FLOOD INSURANCE PROGRAM PARTICIPATION

Requirement: §201.6(c)(3)(ii): [The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.

Spink County participates in the National Flood Insurance Program. There are six communities located in Spink County that do not participate in NFIP. Those communities are: Brentford, Conde, Frankfort, Mellette, Northville, Turton. According to the DFIRM published October 19, 2010, the non-participating communities are zoned entirely A and X. All of the other jurisdictions participate in NFIP. Those who participate include Ashton, Doland, Redfield, Tulare, and Spink County. The county will continue to participate and ensure compliance of the participating local jurisdictions located within the flood plain.

5.1 SPINK COUNTY NFIP PARTICPATION	
Participants	**Non-participants**
Spink County	Brentford
Ashton	Conde
Doland	Frankfort
Redfield	Mellette
Tulare	Northville
	Turton

The Spink County Director of Equalization maintains the flood zone maps and utilizes DFIRMS for all planning mechanisms occurring in the county; specifically development of new homes and businesses and all new construction. The planning and zoning department is responsible for issuing elevation certificates and flood plain development permits. The DFIRMS are used to determine where the natural drainage occurs and ensures that new development will not interrupt the natural drainage. The maps have also been a vital asset to the County in the recent drainage discussions that have taken place within the County. The James River Water Development District is currently working on a coordinated effort with all of the counties that are bisected by or that border the James River. The goal is to produce a study of the James River watershed which will be used to outline activities and/or projects that will mitigate the flooding that is occurring throughout the counties affected by the James River. A paper draft of the DFIRMS is included as Attachment D for quick reference; however, the Planning and Zoning Department and Spink County Emergency Management have access to the DFIRMS in electronic format and thus will utilize and maintain the maps in the electronic format.

IMPLEMENTATION OF MITIGATION ACTIONS

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

Upon adoption of the updated Spink County PDM plan, each jurisdiction will become responsible for implementing its own mitigation actions. Those who did not participate or adopt the PDM will be required to coordinate all mitigation actions with the County. The planning required for implementation is the sole responsibility of the local jurisdictions and private businesses that have participated in the plan update. All of the municipalities have indicated that they do not have the financial capability to move forward with projects identified in the plan at this time, however, all will consider applying for funds through the State and Federal Agencies once such funds become available. If and when the municipalities are able to secure funding for the mitigation projects, they will move forward with the projects identified. Since most of the local jurisdictions only had one mitigation action/goal, prioritization was not necessary. The City of Redfield and Spink County had several mitigation projects and thus, will prioritize those projects in a manner that will ensure benefit is maximized to the greatest extent possible. A benefit cost analysis will be conducted on an individual basis after the decision is made to move forward with a project.

The 2008 PDM Plan was approved after several revisions were recommended by FEMA and made by the plan author. At that time the plan was drafted under the requirements found in the March 2004 version of the crosswalk. Since then, FEMA has produced several planning documents to help aid in the development of local mitigation plans. Some of those documents include the July 1, 2008 crosswalk, the October 1, 2011 Plan Review Guide, and the Local Mitigation Plan Review Tool. Since disaster mitigation was a relatively new concept at that time, mitigation plans were approved with less scrutiny. The same depth of planning was not utilized in the 2008 PDM Plan as was used for the 2012 plan update. The 2008 Plan had the “bare minimum” to meet the FEMA requirements for a mitigation plan, thus the plan lacked relevant information that could be utilized and easily integrated into the County’s and Municipalities’ existing planning mechanisms. Thus, the 2008 Plan was not used or incorporated into other planning documents or mechanisms. It is anticipated with the amount of time, energy, and professional guidance involved during the drafting process of the updated plan, that the County has created a document that has validity and a clear purpose which will be more likely to fit in the existing planning mechanisms that exist county-wide. Additionally, by involving most of the local jurisdictions and by bringing the plan to the attention of neighboring communities, the planning process has brought more awareness of mitigation to the people residing in the County, which will encourage further involvement in the future.

VI. PLAN MAINTENANCE

CHANGES/REVISIONS TO PLAN MAINTENANCE:
The entire Monitoring section in the 2003 Plan was only two paragraphs. Both of those paragraphs are still included in the Plan Maintenance section of the updated plan; however everything else in this section is new.

MONITORING, EVALUATING, AND UPDATING THE PLAN

Requirement §201.6(c) (4)(i): [the plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Spink County and all of the participating local jurisdictions thereof will incorporate the findings and projects of the PDM in all planning areas as appropriate. Periodic monitoring and reporting of the plan is required to ensure that the goals and objectives for the Spink County PDM plan are kept current and that local mitigation efforts are being carried out.

During the process of implementing mitigation strategies, the county or communities within the county may experience lack of funding, budget cuts, staff turnover, and/or a general failure of projects. These scenarios are not in themselves a reason to discontinue and fail to update the Pre-Disaster Mitigation Plan. A good plan needs to provide for periodic monitoring and evaluation of its successes and failures and allow for appropriate changes to be made.

ANNUAL REPORTING PROCEDURES

The plan shall be reviewed annually, as required by the County Emergency Manager, or as the situation dictates such as following a disaster declaration. The Spink County Emergency Manager will review the plan annually in November and ensure the following:

1. The County Elected body will receive an annual report and/or presentation on the implementation status of the plan;
2. The report will include an evaluation of the effectiveness and appropriateness of the mitigation actions proposed in the plan; and
3. The report will recommend, as appropriate, any required changes or amendments to the plan.
4.

FIVE YEAR PLAN REVIEW

Every five years the plan will be reviewed and a complete update will be initiated. All information in the plan will be evaluated for completeness and accuracy based on new information or data sources. New property development activities will be added to the plan and evaluated for impacts. New or improved sources of hazard related data will also be included.

In future years, if the County relies on grant dollars to hire a contractor to write the PDM plan update, the County will initiate the process of applying for and securing such funding in the third year of the plan to ensure the funding is in place by the fourth year of the plan. The fifth year will then be used to write the plan update, which in turn will prevent any lapse in time where the county does not have a current approved plan on file.

The goals, objectives, and mitigation strategies will be readdressed and amended as necessary based on new information, additional experience and the implementation progress of the plan. The approach to this plan update effort will be essentially the same as the one used for the original plan development.

The Emergency Manager will meet with the PDM Steering committee for review and approval prior to final submission of the updated plan.

PLAN AMENDMENTS

Plan amendments will be considered by the Spink County Emergency Manager, during the plan's annual review to take place the end of each county fiscal year. All affected local jurisdictions (cities, towns, and counties) will be required to hold a public hearing and adopt the recommended amendment by resolution prior to considerations by the steering committee.

INCORPORATION INTO EXISTING PLANNING MECHANISMS

Requirement: §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

Redfield is the only jurisdiction located in Spink County that has a comprehensive or capital improvements plan. All of the other jurisdictions do not have the resources, staff, funding, or need for such planning mechanisms. The Spink County Comprehensive plan includes all of the municipalities except the City of Redfield. The City of Redfield and Spink County will consider the mitigation requirements, goals, actions, and projects when it considers and reviews the other existing planning documents such as the capital improvements plan. The Redfield mitigation projects will be considered and prioritized in conjunction with non-mitigation projects, such as water and wastewater infrastructure improvements, new construction of schools, libraries, parks, etc.

The rest of the local jurisdictions cannot incorporate the requirements of the mitigation plan into other planning mechanisms because they do not have any other planning mechanisms that currently exist. The risk assessment which was conducted for the purpose of this plan is specific to mitigation actions and projects included in the Plan and thus is not tied into any other mechanisms that would initiate conversations or actions by the city councils to move forward with actions or projects outlined in the Plan. Absence of such mechanisms creates a problem for the local jurisdictions because ideas, projects, and actions identified as a result of the PDM Plan update process often never move forward because they are forgotten about and no mechanism exists to initiate the process of completing such projects. Thus, the local jurisdictions identified one unrelated mechanism, that could be used to remedy the problem of mitigation projects

getting lost in a bookshelf. Municipalities are required by State law to prepare budgets for the upcoming year and typically consider any expenditure for the upcoming year at that time. South Dakota Codified Law 9-21-2 provides that:

> The governing body of each municipality shall, no later than its first regular meeting in September of each year or within ten days thereafter, introduce the annual appropriation ordinance for the ensuing fiscal year, in which it shall appropriate the sums of money necessary to meet all lawful expenses and liabilities of the municipality….an annual budget for these funds shall be developed and published no later than December thirty-first of each year.

Since all of the local jurisdictions except Redfield lack planning mechanisms in which to incorporate the mitigation actions identified in this plan, it was determined that each year when the budget is prepared the municipalities will also consider the mitigation actions at that time. The local jurisdictions will post a permanent memo to their files as a reminder for them to incorporate their annual review of the mitigation actions identified into the budget preparation process. This does not require the projects be included in the budget, it merely serves as a reminder to the City officials that they have identified mitigation projects in the PDM plan that should be considered if the budget allows for it.

POTENTIAL FUNDING SOURCES

Although all mitigation techniques will likely save money by avoiding losses, many projects are costly to implement. None of the local jurisdictions have the funds available to more forward with mitigation projects at this time, thus, the Potential Funding Sources section was included so that the local jurisdictions can work towards securing funding for the projects. Inevitably, due to the small tax base and small population most of the local jurisdictions do not have the ability to generate enough revenue to support anything beyond the basic needs of the community. Thus mitigation projects will not be completed without a large amount of funding support from State or Federal programs. The Spink County jurisdictions will continue to seek outside funding assistance for mitigation projects in both the pre- and post-disaster environment. Primary Federal and State grant programs have been identified and briefly discussed, along with local and non-governmental funding sources, as a resource for the local jurisdictions

Federal

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

Title: Pre-Disaster Mitigation Program Agency: Federal Emergency Management Agency
Through the Disaster Mitigation Act of 2000, Congress approved the creation of a national program to provide a funding mechanism that is not dependent on a Presidential Disaster Declaration. The Pre-Disaster Mitigation (PDM) program provides funding to states and communities for cost-effective hazard mitigation activities that complement a comprehensive mitigation program and reduce injuries, loss of life, and damage and destruction of property. The funding is based upon a 75% Federal share and 25% non-Federal share. The non-Federal match can be fully in-kind or cash, or a combination. Special accommodations will be made for "small and impoverished communities", who will be eligible for 90% Federal share/10% non-

Federal.

FEMA provides PDM grants to states that, in turn, can provide sub-grants to local governments for accomplishing the following eligible mitigation activities: State and local hazard mitigation planning,
Technical assistance (e.g. risk assessments, project development), Mitigation Projects, Acquisition or relocation of vulnerable properties, Hazard retrofits, Minor structural hazard control or protection projects
Community outreach and education (up to 10% of State allocation)

Title: Flood Mitigation Assistance Program
Agency: Federal Emergency Management Agency

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

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

Title: Hazard Mitigation Grant Program
Agency: Federal Emergency Management Agency

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

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

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

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

setting priorities for funding and administering the program.

Title: Public Assistance (Infrastructure) Program, Section 406
Agency: Federal Emergency Management Agency

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

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

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

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

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

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

Title: SBA Disaster Assistance Program
Agency: US Small Business Administration

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

Title: Community Development Block Grants
Agency: US Department of Housing and Urban Development

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

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

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

CONTINUED PUBLIC PARTICIPATION/INVOLVEMENT

Requirement: §201.6(c)(4)(iii): [the plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

During interim periods between the five year update, efforts will be continued to encourage and facilitate public involvement and input. The plan will be available for public view and comment at the Spink County Emergency Management Office located in the Spink County Courthouse and the NECOG office. Comments will always be received whether orally, written or by e-mail.

All ongoing workshops and trainings will be open to the public and appropriately advertised. Ongoing press releases and interviews will help disseminate information to the general public and encourage participation.

As implementation of the mitigation strategies continues in each local jurisdiction, the primary means of public involvement will be the jurisdiction's own public comment and hearing process. State law as it applies to municipalities and counties requires this as a minimum for many of the proposed implementation measures. Effort will be made to encourage cities, towns and counties to go beyond the minimum required to receive public input and engage stakeholders.