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# 2021 Barnes County, North Dakota, Multi-Jurisdictional Multi-Hazard Mitigation Plan



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## Barnes County, North Dakota

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1. Introduction
2. Planning Process
3. Profile & Inventory
4. Risk Assessment (THIRA)
5. Future Conditions
6. Mitigation Strategy
7. Capability Assessment
8. Jurisdictions
9. Maps
10. Plan Maintenance

## Appendices

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# 1. Introduction

## Executive Summary

The updating of the Barnes County, N.D. Multi-Jurisdictional Multi-Hazard Mitigation Plan (MHMP) was conducted over a one-year period. It included the review of hazards, risks, vulnerabilities, and capabilities of the county, updating of vulnerable populations and areas, and development of a mitigation strategy for Barnes County accurately reflecting plan research and progress. The review of hazard impacts to the county is ongoing by county officials, as are the efforts to mitigate injuries and damages from natural hazards and man-made threats. The planning process and this plan allow the county's residents, businesses, stakeholders, and federal and state agencies to have input and to identify actions to assure the safety and protection of people and property. The mitigation strategy for Barnes County consists of 39 projects. Specific mitigation projects were developed for all incorporated cities. See Table 6.1 in Chapter 6, Mitigation Strategy for a breakdown of prioritization for all projects in the plan. **A mitigation survey was administered during the planning process. A total of 372 responses were received.**

The 14 natural hazards and man-made threats profiled in this plan include:

### Natural Hazards

- Drought
- Fire (Urban/Structure and Wildland)
- Flood (Overland and Riverine)
- Geologic Hazards
- Infectious Disease – Animal, Human, and Plant
- Severe Summer Weather
- Severe Winter Weather
- Space Weather

### Adversarial (Homeland Security) Threats

- Civil Disturbance
- Criminal, Terrorist or Nation-State Attack
- Cyberattack

### Technological Threats

- Dam Failure
- Hazardous Material Release
- Transportation Incident

**Goal 1: Improve and expand education and outreach programs to improve public awareness of hazards and threats.**

**Goal 2: Improve and expand administrative and technical capability to mitigate hazards and threats.**

**Goal 3: Improve and expand financial capability to mitigate hazards and threats.**

**Goal 4: Improve and expand planning and regulatory capability to mitigate hazards and threats.**

**Goal 5: Reduce and/or eliminate impacts of hazards and threats.**

**Goal 6: Improve resiliency of critical facilities and infrastructure.**

**Goal 7: Provide places of refuge and early warnings for the public and vulnerable populations to take protective action during active hazard and threats.**

To assist in the use, implementation, and updating of this document, the plan includes the federal and state plan approval letters and plan review of this update, and the adoption letters from each of the jurisdictions in Appendix 1. The chapters and appendices provide a history of the data reviewed and analyzed in the production process of the plan.

### **Jurisdictions**

Impacts from natural hazards and man-made threats varies between jurisdictions. Problem statements from the 2015 plan were revised based on information gathered at jurisdictional workshops and Steering Committee meetings.

### **Barnes County**

Barnes County can be impacted by civil disturbance; criminal, terrorist or nation-state attack; cyberattack; dam failure, drought, fire (urban/structure collapse, and wildland/rural), flood (overland and riverine), geologic hazard, hazardous material release, infectious disease, severe summer weather, severe winter weather, space weather, and transportation incident. Flooding is a major issue due to the presence of a high-water table, closed basins, and the James River traversing through the county. The drainage system in the county needs upgrading to reduce/eliminate occurrences of overland flooding and damage to infrastructure. Structures continue to remain in flood-prone and geologic-hazard areas. Critical facilities and infrastructure need engineering studies to identify the proper scope of work for retrofitting and upgrading to withstand natural hazards and man-made threats. Isolation of incorporated communities from blocked roads or prolonged power outages can result from severe weather. Adoption and enforcement of building codes and the lack of storm shelters remain an issue in smaller communities. Critical facilities and infrastructure lack generators for permanent backup power. Portable generators are also needed. The risk to cyberattack is increasing due to the continued digitization of society.

The county has administrative and technical, education and outreach, financial, and planning and regulatory capabilities to accomplish mitigation. However, the county relies on outside sources for construction of permanent flood control measures and other large-scale mitigation projects.

Permanent flood protection, flood control measures, improved drainage, upgrading of critical facilities and infrastructure, upgrading of emergency sirens, improved access for emergency services, and construction of additional storms shelters, and continuous improvement to administrative and technical, education and outreach, financial and planning and regulatory capabilities are a priority for the county.

### **City of Dazey**

Located in a closed basin, the city of Dazey experiences overland flooding causing damage to property, critical facilities, and infrastructure. The city lacks generators at critical facilities and infrastructure and the emergency siren is manually activated. The city's pumphouse controls are failing, the walls of the sanitary lagoon are impacted from ground saturation, the storm sewer is undersized, and the fire hall is too small to accommodate modern trucks and equipment. The city has started a capital improvement plan and needs to complete it. With little to no capabilities, the city is dependent on outside sources for mitigation.

Engineering to upgrade/retrofit critical facilities and infrastructure, improved drainage, installation of generators at critical facilities and infrastructure, upgrading of the outdoor early warning system, and updating of planning and regulatory capabilities are a priority for the city.

### **City of Fingal**

The city of Fingal experiences overland flooding on city streets due to poor drainage. Changes in agriculture practices of surrounding farmland has increased runoff causing additional flooding issues in the city. Critical facilities and infrastructure are vulnerable to flooding and lack generators. The city's emergency siren is manually-activated. Transportation accidents are another issue as the city has seen an increase in truck and rail traffic. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Engineering to upgrade/retrofit critical facilities and infrastructure, improved drainage, installation of generators are critical facilities and infrastructure, and upgrading of the outdoor early warning system are a priority for the city.

### **City of Kathryn**

Located in proximity to Clausen Springs Dam, which experienced major erosion in 2009 and resulted in evacuation of the city, the city of Kathryn is vulnerable to a dam failure event. The Clausen Springs Dam and the Sheyenne River Valley National Scenic Byway attract recreation and temporary populations during summer months. The city is also located in a low point with respect to surrounding topography and is near the Sheyenne River, which contributes to overland flooding issues. The emergency siren on the fire hall is manually activated. The city of Kathryn's water supply is furnished by a spring-fed reservoir above the city and potable water is piped into the city. Two hazards threaten the city's water supply: geologic hazard, specifically landslide, and drought. The geologic hazard of landslide has caused the city of Kathryn to experience numerous water supply line breaks over the years. The sewer line from the lagoon to the city lift station was broke by a rural water contractor in 2015 and needs to be upgraded. The city had to rebuild the line which cost \$150,000 and the city took out a loan. In addition, the reduced amount of rainfall has reduced the amount of water flowing into the collection site threatening the availability of potable water. The city receives tax revenue from rental income on a former schoolhouse occupied by Valley City State University for research purposes. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Education and outreach, flood control measures, installation of new and upgrading of water infrastructure, installation of a generator for backup power, engineering studies for upgrading/retrofitting of critical facilities and infrastructure, and an upgraded emergency siren are a priority for the city.

### **City of Leal**

The city of Leal experiences overland flooding from 10 Mile Lake due to surrounding topography and inadequate drainage, which impacts infrastructure. The culvert under the CPR railroad line is suspected to have collapsed, further exacerbating flooding issues. The city has a manually-activated emergency siren instead of a siren activated by county-dispatch. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Improved drainage/flood control measures and an upgraded outdoor emergency system are a priority for the city.

### **City of Litchville**

The city of Litchville is vulnerable to flooding and severe summer weather as the city's storm water system is inadequate. Flooding occurs on city streets primarily near the city park. The city does have a storm water drainage system, but the system lacks the capacity to allow for property drainage. Windstorms and high wind during severe summer weather also causes damage to structures in the city from fallen tree branches and wind-blown debris. Debris can also clog drainage and contribute to overland flooding. Critical facilities and infrastructure lack backup sources of power. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Engineering to upgrade/retrofit the storm water drainage system, improved drainage at the city park, creation of a tree trimming maintenance system, and installation of backup generators at critical facilities and infrastructure are a priority for the city.

### **City of Nome**

Severe summer weather and severe winter weather produce heavy precipitation impacting the city of Nome and its sanitary sewer lagoon system. Critical facilities and infrastructure lack generators for backup power. The city has a manually-activated emergency siren. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Engineering to upgrade/retrofit the lagoon system, installation of generators at critical facilities and infrastructure, upgrading of the outdoor early warning system are a priority for the city.

### **City of Oriska**

The city of Oriska is vulnerable to floods and severe summer weather as heavy rain causes overland flooding and impacts critical facilities and infrastructure. Flooding occurs most frequently on city streets near the city park. The city does not have a storm water drainage system further contributing to flooding and drainage issues. The city has a manually-activated emergency siren. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Improved drainage, installation of generators at critical facilities and infrastructure, and upgrading of the outdoor emergency siren are a priority for the city.

### **City of Pillsbury**

Severe winter weather produces heavy snow that blocks roads and results in overland flooding and drainage issues in the spring in the city of Pillsbury. With a high number of abandoned structures and trailer homes, and a high elderly population, the city is vulnerable to natural hazards and man-made threats. The city lacks an emergency siren. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Improved drainage and installation of an emergency siren are a priority for the city.

### **City of Rogers**

The city of Rogers experiences overland flooding from severe summer and winter weather as it lacks a property storm water system and has a high-water table. Blocked roads from standing water are common. The city lacks generators at critical facilities and infrastructure. The city has two outdoor early warning sirens – one manual-activated and once dispatch-activated. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Improved drainage, installation of generators at critical facilities and infrastructure, and upgrading of outdoor early warning system are a priority for the city.

### **City of Sanborn**

The city of Sanborn experiences overland flooding from severe summer weather and severe winter weather as the city's storm water drainage system is inadequate, which impacts critical facilities and infrastructure. The lack of drainage of Sanborn Lake impacts an adjacent freight railroad line and roads leading to the city. Blocked roads occur from severe winter weather and can result in isolation of the city. With a high number of abandoned structures and trailer homes, and a high elderly population, the city is vulnerable to windstorms. The city has little to no capabilities for mitigation and therefore is dependent on outside sources.

Improved drainage, installation of generators at critical facilities and infrastructure, and construction of a storm shelter are a priority for the city.

### **City of Sibley**

Due to its location on Lake Ashtabula, the city of Sibley has a permanent population of around 30 residents and a temporary population from May to September of 300 residents for recreation. The city lacks a storm shelter for seasonal populations. The city also experiences overland flooding issues due to surrounding topography. Critical facilities and infrastructure lack permanent generators for backup power sources. The city's outdoor emergency alerting system is manually activated. With little to no capabilities other than a drought management plan, the city is dependent on outside sources for mitigation.

Engineering of measures to mitigation overland flooding, installation of generators at critical facilities and infrastructure, upgrading of the outdoor early warning system, and a storm shelter are a priority for the city.

### **City of Valley City**

The city of Valley City is impacted through injury, loss of life, loss of economy, and property damage from civil disturbance; criminal, terrorist or nation-state attack, cyberattack, dam failure, drought, fire (urban and wildland), flood, geologic hazard, hazardous material release, infectious disease, severe summer weather, severe winter weather, space weather, and transportation incident. The city of Valley City is located on the Sheyenne River, which is controlled by the Baldhill Dam. However, flooding (riverine and overland) has continued to impact the city's drinking/potable water, sanitary sewer, and storm water system. Hazardous material release, shortage or outage of critical materials and



infrastructure, and transportation incidents are cause for concern due to a growing population, increase in shipment of oil and chemicals via truck and railroad transportation, and an increase in industrial development. The city contains numerous vulnerable populations such as the Barnes County Correctional Center, CHI-Mercy Hospital, the only assisted living and senior housing developments in Barnes County, dormitory populations at Valley City State University, trailer/mobile home courts, a substantial elderly population, public and private elementary schools, and the largest middle school/high school between Jamestown and Fargo. Permanent backup generators have been installed at the city's main lift station, but additional generators are needed at critical facilities and infrastructure. The city has large infrastructure projects that need engineering studies completed to identify best options or alternatives.

The city of Valley City has administrative and technical, education and outreach, financial, and planning and regulatory capabilities to accomplish mitigation. However, the city relies on outside capital for construction of permanent flood protection, retrofitting/upgrading existing or construction new critical facilities and infrastructure, and large-scale mitigation projects.

Improvements/increases to administrative and technical, education and outreach, financial, and planning and regulatory capabilities are needed. In addition, permanent flood protection, flood control measures, buyouts of structures in hazard prone areas, installation of permanent generators at critical facilities and infrastructure, and conducting engineering studies to identify options for retrofitting/upgrading existing or construction new critical facilities and infrastructure are a priority for the city.

### **City of Wimbledon**

The lack of a property storm water drainage system causes overland flooding from severe summer weather and severe winter weather events. The city's outdoor emergency alerting system is manually activated. Windstorms are frequent in the area, which block roads due to snow drifts and various debris, and cause power outages. The Wimbledon Fire Hall, community center, water tower, and lift stations lack permanent sources of backup power. The city lacks a proper storm shelter. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Improved drainage, installation of generators at critical facilities and infrastructure, upgrading of the outdoor early warning system, and a storm shelter are a priority for the city.

### **Background**

The Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan (MHMP) was developed and received approval from the Federal Management Agency (FEMA) in 2020. This plan update is the third update to the mitigation plan for Barnes County.

The MHMP Steering Committee understands that the plan must be dynamic and detailed to include the specific risks of threats and hazards to the county and its jurisdictions. Improvements, updates, and revisions will be made constantly to assure this plan continues to mitigate the potential losses and damages that can impact people and property in Barnes County.

### **Purpose**

As defined by the Disaster Mitigation Act of 2000, hazard mitigation is any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards. The Act of 2000 was an amendment to the Robert T. Stafford Disaster Relief and Emergency Assistance to authorize a program for pre-disaster mitigation, to streamline the administration of disaster relief, to control the Federal costs of disaster assistance, and for other purposes.

**According to a study by the National Institute for Building Standards, pre-disaster mitigation saves an average of \$6.00 for every \$1.00 spent. Additionally, the Pew Research Center recently identified that North Dakota saves an average of \$6.55 for every \$1.00 spent on mitigation projects.** Mitigation can range from infrastructure projects such as raising of roads, burying of power lines, or installation of generators for critical facilities and infrastructure, to public education and outreach programs.

The purpose of this plan is to fulfill federal, state, and local hazard mitigation planning responsibilities; to promote pre- and post-disaster mitigation measures, short and/or 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; to improve quality of life; and to eliminate or minimize conditions which would have an undesirable impact on our citizens, the economy, environment, and well-being of the county.

### **Objective**

The objective of this plan is to establish a methodical process to assist in hazard and threat identification, impact evaluation, and action plan development to decrease the impacts from hazards where possible and to protect lives and property.

### **Scope**

The scope of the Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan is countywide. The plan is not necessarily limited to federal, state, or locally declared disasters or emergencies. Any time situations or incidents occur that produce a requirement for mitigation actions, activities, and strategies, etc.; they will be developed and incorporated into the Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan.

## **2. Planning Process**

The planning process chapter outlines how the plan was updated to meet mitigation planning requirements. The chapter summarizes all steering committee and hazard/threat meetings, and jurisdictional workshops.

No need for anyone to worry about this chapter other than the plan contractor.

### 3. Overview – Barnes County, North Dakota

A key component of mitigation planning is to conduct a profile and inventory to identify what assets will be affected by natural hazards and/or man-made threats. Chapter 3, Profile and Inventory is divided into the following sections:

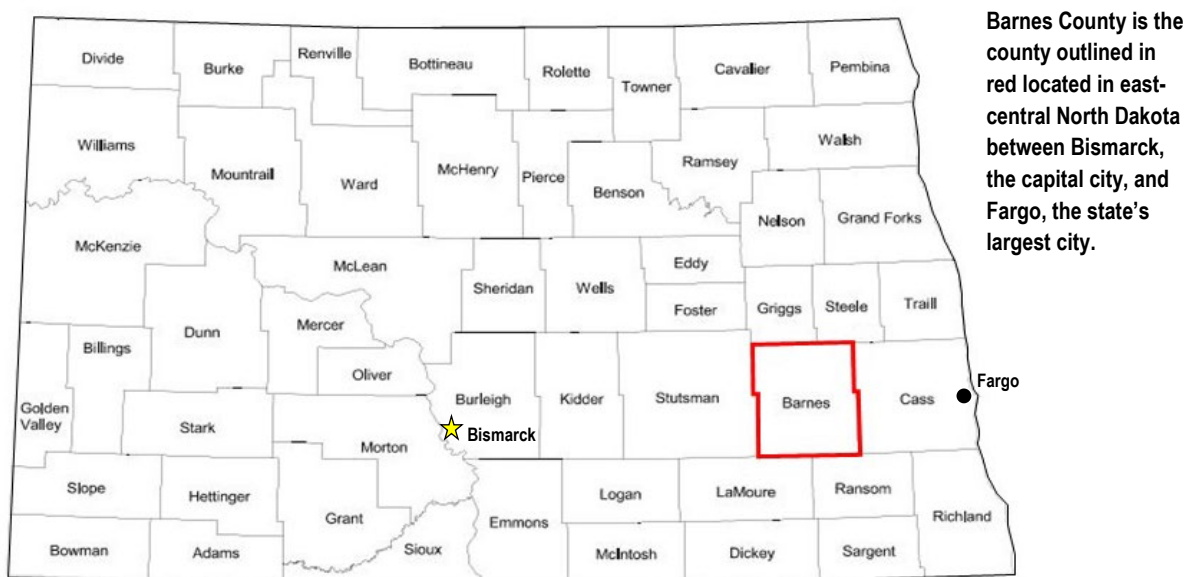
- Chapter 3.1, Demographics. Chapter 3.1, Demographics provides demographic trends and projections along with vulnerable population information for Barnes County and incorporated jurisdictions.
- Chapter 3.2, Profile and Inventory. Chapter 3.2, Profile and Inventory provides a profile and inventory of Barnes County and identifies the most vulnerable assets and populations. Additional demographic information highlights population growth

#### Barnes County and Incorporated Jurisdictions Overview

Barnes County is in east-central North Dakota and is the 15th largest county in land area of the 53 counties in the state, encompassing 1,513 square miles. Of the 1,513 square miles, approximately 1,470 square miles of it is land areas (97.16 percent) and 43 square miles (2.84 percent) is water surface area. The county is approximately forty-two (42) miles from north to south and approximately thirty-five (35) miles from east to west. The 2020 population of the County is 10,853 people and has a population density of 7.17 people per square mile. Figure 9.1 in Chapter 9, Maps is a general map of the county showing jurisdiction locations, transportation routes, airports, and bodies of water.

Barnes County, highlighted in red, is in east-central North Dakota between the city of Fargo (the state’s largest city) and the city of Bismarck, the state capital.

Figure 4.1 – Location of Barnes County in the State of North Dakota



### **Neighboring Jurisdictions**

The county is bordered on the north by Griggs County, on the northeast by Steele County, on the east by Cass County, on the west by Stutsman County, on the southwest by LaMoure County, and on the southeast by Ransom County. Interstate 94, a major trade route extending from the Seattle, Washington to Detroit, Michigan, traverses east and west through the county. Other major highways in the county include N.D. Highways 1, 9, 26, 32, and 46.

### **Townships**

There are forty-two (42) townships in the county. All are organized townships. They are from northwest to southeast: Pierce, Lake Town, Dazey, Sibley, Baldwin, Ellsbury, Uxbridge, Edna, Rogers, Ashtabula, Prairie, Minnie Lake, Brimer, Anderson, Stewart, Getchell, Noltimier, Weimer, Eckelson, Potter, Hobart, Valley, Alta, Oriska, Mansfield, Hemen, Green, Marsh, Cuba, Springvale, Meadow Lake, Svea, Skandia, Nelson, Norma, Binghampton, Greenland, Rosebud, Spring Creek, Oak Hill, Thordenskjold and Raritan. Figure 9.2 in Chapter 9, Maps shows the geographic location of the townships in the county.

### **Incorporated Jurisdictions.**

The incorporated jurisdictions in Barnes County included in this plan are Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, and Wimbledon.

### **Unincorporated Communities**

Unincorporated communities in Barnes County include Berea, Cuba, Daily, Eastedge, Eckelson, Hastings, Koldok, Lucca, North Valley City, Peak, and Urbana.

### **Natural Resources**

Barnes County features numerous waterfowl production areas (WPAs) and national wildlife refuges. The United States Fish and Wildlife Service manage wildlife refuges, which are public lands and waters set aside to conserve fish, wildlife and plants. The WPAs are scattered throughout the county while the wildlife refuges are in the central portion of the county. Figure 9.3 in Chapter 9, Maps illustrates the national wildlife refuges, WPAs, and wildlife management areas in Barnes County.

### 3.1 Demographics - Barnes County and Incorporated Jurisdictions

#### Population

Population statistics for Barnes County for the years 2000, and 2020 were obtained through the U.S. Census Bureau-Decennial Census. Population estimates and projections for 2020, 2025, and 2030 were provided by Maxfield Research and Consulting, a Minneapolis-based real estate and demographics research firm.

The US Census Bureau compiles demographic, economic and housing statistics each year between Decennial Censuses to provide more up to date data during the 10-year interim period between the counts mandated by the Constitution for the purpose of redistricting. These estimated statistics are compiled from surveys of households in the US in each state. More than 3.5 million households are contacted each year to provide data for the ACS. The ACS (American Community Survey) is a sample and different samples yield different estimates of specific variables or values.

The “Margin of Error” is a measure of the possible variation of the estimated data point. Data users can be certain at a given confidence level that the estimate and the actual value of the data point different by no more than the margin of error. The US Census Bureau Level of Confidence is 90%.

The Census Bureau completes statistical testing on every variable that it gathers. The statistical testing calculates the margin of error and calculates the confidence level of the variable. Statistical testing is completed for each year, across multiple years, across non-overlapping multi-year periods, across different geographies and between surveys (i.e., Census and ACS).

For small geographies, the Margin of Error may be larger than the statistic or variable itself. Combining estimates across larger geographies can help to reduce the margin of error and increasing the confidence level of the estimate.

#### Population Statistics

Table 3.1.1 summarizes the population statistics for Barnes County. Statistics on population trends and projections are needed to understand the distribution of people across the county. These statistics also highlight where potential future needs will be for emergency services based on population distribution growth and density.

The following are key points from the Table 3.1.1.

- As of 2010, Barnes County contained 11,066 people, a decrease of 9.5% from 2000. During the same period, the population of Valley City also decreased by 3.5% (241 people) while the Remainder of Barnes County declined by 9.5% (468 people).
- From 2010 to 2020, Valley City’s population again declined but by a smaller number of people, 41 (-0.6%). Barnes County decreased by 426 people (3.8%) from 2010 to 2020.
- The population of Barnes County is expected to increase between 2020 and 2030 (5.4%). The population in Valley City is expected to decline by 5.2%, while the Remainder of the County is expected to increase by 22.3% to 2030.

- Between 2000 and 2010, the number of households in Valley City increased by 1.1% (32 households). In contrast, the Remainder of Barnes County had a decrease in households (-4.7% - 90 households) between 2000 and 2010.
- From 2010 to 2020, Valley City saw a decline of 0.3% in its households. By comparison, the Remainder of Barnes County experienced household growth of 5.1%.
- Household decline is expected in Valley City and the Remainder of Barnes County between 2020 and 2030. Valley City is projected to lose 150 households, a decline of 5.0%, while the Remainder of the Market Area is forecast to lose 144 households, declining by 7.4%.
- The majority of households in Barnes County are in Valley City. In 2000, 58.0% of the County lived in Valley City. This proportion increased to 59.5% in 2010 and 61.5% in 2020. The trend of people moving from more rural areas to county seats and regional population centers is occurring throughout the US. More jobs and opportunities attract those from smaller counties and communities.

### **Age Distribution: 24 and Below**

Table 3.1.2 summarizes the population and age distribution for individuals 24 and under in Barnes County and incorporated jurisdictions.

The following are key points from Table 3.1.2.

- Between 2020 and 2025, Barnes County's youth (24 and under) population is projected to decrease by 164 people (5.1%). Much of this decline will be among people ages 20 to 24 (-13.6% - 108 people).
- In Barnes County, Valley City's 24 and under population is expected to decline by 3.6% (71 people) while the Remainder of the County is projected to decline by an even greater percentage, 7.7% (93 people).

### **Age Distribution: Older Adult (65+)**

Table 3.1.3 summarizes the population and age distribution for individuals aged 65 and older in Barnes County and incorporated jurisdictions.

The following are key points from Table 3.1.3.

- Between 2020 and 2025, Barnes County's older adult (65+) population is projected to increase by 344 people (12.5%). Much of this increase will be in the 75 to 79 and 70 to 74 age cohorts which are projected to grow by 28.5% and 21.0%, respectively over the next five years.
- In Barnes County, Valley City's 65 and older population is expected to increase by 6.9% (117 people) while the Remainder of the County is projected to increase by an even greater percentage, 21.3% (227 people). The higher growth rate of older individuals in the Remainder of Barnes County compared to Valley City reflects the older age of outlying areas in the County.

## Households by Type

Table 3.1.4 summarizes household types in Barnes County and the city of Valley City. Group Quarters is a place where people live or stay, in a group living arrangement, that is owned or managed by an entity or organization providing housing and/or services for the residents. This is not a typical household-type living arrangement. These services may include custodial or medical care as well as other types of assistance, and residency is commonly restricted to those receiving these services. People living in group quarters are usually not related to each other. Group quarters include such places as college residence halls, residential treatment centers, skilled nursing facilities, group homes, military barracks, correctional facilities, and workers' dormitories.

The following are key points from Table 3.1.4.

- The percentage of households in families in 2010 was 52.3% in Valley City, 74.1% in the Remainder of Barnes County, and 60.7% in all of Barnes County. By 2020, these percentages decreased to 47.8% in Valley City, 69.5% in the Remainder of Barnes County and 60.4% in all of Barnes County.
- In Valley City, the number of married couple families without children decreased by 16 households (1.9%). Additionally, other family households in Valley City decreased by 35.9% after decreasing by 120 households.
- Barnes County experienced an 8.5% decline in the number of married couples with children (-72 households), while the number of married couples without children also decreased by 72 households (-4.5%). Other family households decreased 18.3% during the decade (-87 households).
- The Remainder of Barnes County saw a decline of married couple families with children, declining by 15 households (-1.8%), while married couples without children also decreased by 47 households (-11.4%). Other families increased by 43 households (31.5%).
- Between 2010 and 2020, non-family households collectively increased by 132 in Valley City (9.3%). The Remainder of Barnes County experienced an 23.7% increase (113 people) in nonfamily households, which means nonfamily households in the County as a whole increased by 11.5% (219 people).
- The number of households identified as Living Alone increased 10.6% in Valley City over the past ten years, from 1,177 households in 2010 to 1,302 households in 2020, while the number of households with roommates increased 2.9% (7 households). In comparison, single-person households increased 18.3% in the Remainder of the County while the number of households with roommates increased by 58.0% in the Remainder of the County.



### Households with Children

Table 3.1.5 summarizes household with children in Barnes County and the city of Valley City.

The following are key points from Table 3.1.5.

- In 2010, 21.6% of households in Valley City had children. This was lower than that of the Remainder of Barnes County (27.2%), Barnes County (23.8%) and North Dakota (26.1%).
- As of 2020, the percentage of households with children in Valley City declined to 24.8%. The percentages of households with children also declined to 20.2% in Barnes County and 25.7% in the North Dakota.
- In 2020, almost 83% (82.6%) of households in Valley City do not have children. This is higher than the Remainder of Barnes County (75.2%), Barnes County (79.8%) and the North Dakota (74.3%).

### Concentrated Poverty

Table 3.1.6 summarizes household with children in Barnes County and the city of Valley City. The poverty rates are based on a threshold formula that the US Census Bureau has devised, which is the difference in dollars between a family or individual's income and poverty threshold or income deficit. Below that number is the percentage in poverty.

The following are key points from Table 3.1.6.

- In 2018, 11.4% (683 people) of the population for whom poverty status was determined in Valley City were below the poverty level. This was above the percentage of the population in poverty in the Remainder of Barnes County (9.2%), Barnes County (10.5%) and North Dakota (10.9%).

### Disability by Type

Table 3.1.7 summarizes populations living with disabilities by type in Barnes County and the city of Valley City. People in group homes are not included in the dependent difficult category. A person can be counted in one or more disability categories. The definitions of self-care difficulty and independent difficulty from the US Census are as follows:

- Self-care difficulty was derived from question 18c, which asked respondents if they had “difficulty dressing or bathing.” Difficulty with these activities are two of six specific Activities of Daily Living (ADLs) often used by health care providers to assess patients' selfcare needs. Prior to the 2008 ACS, the question on self-care limitations asked about difficulty “dressing, bathing, or getting around inside the home,” under the label “Self-care disability.”
- Independent living difficulty was derived from question 19, which asked respondents if due to a physical, mental, or emotional condition, they had difficulty “doing errands alone such as visiting a doctor's office or shopping.” Difficulty with this activity is one of several Instrumental Activities of Daily Living (IADL) used by health care providers in making care decisions. Prior

to the 2008 ACS, a similar measure on difficulty “going outside the home alone to shop or visit a doctor’s office” was asked under the label “Go-outside-home disability.”

The following are key points from Table 3.1.7.

- Approximately two in ten individuals (21.6%) living in Valley City suffer from a disability. This is higher than the percentage of individuals suffering from a disability in Barnes County (17.5%).
- The disability condition with the highest percentage of individuals in Valley City and Barnes County is ambulatory difficulty.
- The disability conditions with the two lowest percentages in both Valley City and Barnes County are self-care difficulty.
- Individuals with multiple disabilities are counted in several categories. Therefore, the total number of individuals in Valley City with disabilities (1,318) and in Barnes County (1,818) is lower than the total of all subcategories.

### Languages Spoken at Home

Table 3.1.8 summarizes languages spoken at home in Barnes County and the city of Valley City. The data includes the total population five years of age and older, which includes student populations.

The following are key points from Table 3.1.8.

- Between 2010 and 2018, the percentage of people in Valley City speaking a language other than English at home decreased from 5.2% to 3.4%. In contrast, the percentage of people in the Remainder of Barnes County speaking a language other than English at home increased from 1.8% to 2.4% in 2020.
- As of 2018, almost 97% (96.6%) of people in Valley City speak only English at home. In the Remainder of Barnes County, the percentage is even higher at 97.6%. The State of North Dakota, while slightly less than Valley City and the Remainder of Barnes County still has almost 94% (93.9%) of its population speaking English at home as of 2018.

### Pet Ownership

Table 3.1.9 summarizes pet ownership in Barnes County and the city of Valley City.

The following are key points from Table 3.1.9.

- In Valley City nearly 1,500 households (1,494) own a pet. This constitutes over half (50.2%) of all households in the City that own a pet. Of those that own a pet, 36.1% own a dog and 23.4% own a cat.
- In the Remainder of Barnes County about 1,400 households (1,397) own a pet. This constitutes over 72% (72.2%) of all households in the Remainder of the County that own a pet. Of those that own a pet, 57.8% own a dog and 45.5% own a cat.

- In Barnes County approximately 2,900 households (2,891) own a pet. This constitutes over 58.9% of all households in the County that own a pet. Of those that own a pet, 44.6% own a dog and 32.1% own a cat.
- In the State of North Dakota 196,501 households own a pet. This constitutes about 59% (58.9%) of all households in the State that own a pet. Of those that own a pet, 45.0% own a dog and 28.6% own a cat.

**Table 3.1.1 – 2000 to 2030 Barnes County and Incorporated Jurisdictions Population Statistics**

POPULATION GROWTH TRENDS AND PROJECTIONS											
VALLEY CITY, REMAINDER OF BARNES COUNTY, BARNES COUNTY, & STATE OF NORTH DAKOTA											
2000 - 2030											
	Historic Census		Estimate (Maxfield)	Projected (Maxfield)		Change					
	2000	2010	2020	2025	2030	2000 - 2010		2010 - 2020		2020 - 2030	
						No.	Pct.	No.	Pct.	No.	Pct.
<b>Population</b>											
Valley City	6,826	6,585	6,544	6,375	6,206	-241	-3.5%	-41	-0.6%	-338	-5.2%
Remainder of Barnes County	4,949	4,481	4,096	4,553	5,010	-468	-9.5%	-385	-8.6%	914	22.3%
<b>Barnes County</b>	<b>11,775</b>	<b>11,066</b>	<b>10,640</b>	<b>10,928</b>	<b>11,216</b>	<b>-709</b>	<b>-6.0%</b>	<b>-426</b>	<b>-3.8%</b>	<b>576</b>	<b>5.4%</b>
State of North Dakota	642,200	672,591	765,308	837,153	908,998	30,391	4.7%	92,717	13.8%	143,690	18.8%
<b>Households</b>											
Valley City	2,954	2,986	2,978	2,903	2,828	32	1.1%	-8	-0.3%	-150	-5.0%
Remainder of Barnes County	1,930	1,840	1,934	1,911	1,790	-90	-4.7%	94	5.1%	-144	-7.4%
<b>Barnes County</b>	<b>4,884</b>	<b>4,826</b>	<b>4,912</b>	<b>4,814</b>	<b>4,618</b>	<b>-58</b>	<b>-1.2%</b>	<b>86</b>	<b>1.8%</b>	<b>-294</b>	<b>-6.0%</b>
State of North Dakota	257,152	281,192	333,614	354,333	395,771	24,040	9.3%	52,422	18.6%	62,157	18.6%
<b>Persons Per Household</b>											
Valley City	2.31	2.21	2.20	2.20	2.19						
Remainder of Barnes County	2.56	2.44	2.12	2.38	2.80						
<b>Barnes County</b>	<b>2.41</b>	<b>2.29</b>	<b>2.17</b>	<b>2.27</b>	<b>2.43</b>						
State of North Dakota	2.50	2.39	2.29	2.36	2.30						

Sources: U.S. Census; ESRI; Maxfield Research and Consulting, LLC.

Table 3.1.2 – 2010 to 2025 Barnes County and Incorporated Jurisdictions Age Distribution: 24 and Below

POPULATION AGE DISTRIBUTION: 24 & UNDER								
VALLEY CITY, REMAINDER OF BARNES COUNTY, BARNES COUNTY, & NORTH DAKOTA								
2010 to 2025								
	Number of People			Change				
	U.S. Census	Estimate	Forecast	Estimate/Forecast				
	2010	2020	2025	2010-2020		2020-2025		
	No.	No.	No.	No.	Pct.	No.	Pct.	
<b>Valley City</b>								
4 and Under	351	322	321	-29	-8.3%	-1	-0.3%	
5 to 9	362	316	304	-46	-12.7%	-12	-3.8%	
10 to 14	310	317	296	7	2.3%	-21	-6.6%	
15 to 19	467	445	448	-22	-4.7%	3	0.7%	
20 to 24	614	577	537	-37	-6.0%	-40	-6.9%	
<b>Total</b>	<b>2,104</b>	<b>1,977</b>	<b>1,906</b>	<b>-198</b>	<b>-9.4%</b>	<b>-71</b>	<b>-3.6%</b>	
<b>Remainder of Barnes County</b>								
4 and Under	231	220	208	-11	-4.8%	-12	-5.5%	
5 to 9	265	244	235	-21	-7.9%	-9	-3.7%	
10 to 14	326	277	269	-49	-15.0%	-8	-2.9%	
15 to 19	320	250	254	-70	-21.9%	4	1.6%	
20 to 24	117	217	149	100	85.5%	-68	-31.3%	
<b>Total</b>	<b>1,259</b>	<b>1,208</b>	<b>1,115</b>	<b>-51</b>	<b>-4.1%</b>	<b>-93</b>	<b>-7.7%</b>	
<b>Barnes County</b>								
4 and Under	582	542	529	-40	-6.9%	-13	-2.4%	
5 to 9	627	560	539	-67	-10.7%	-21	-3.8%	
10 to 14	636	594	565	-42	-6.6%	-29	-4.9%	
15 to 19	787	695	702	-92	-11.7%	7	1.0%	
20 to 24	731	794	686	63	8.6%	-108	-13.6%	
<b>Total</b>	<b>3,363</b>	<b>3,185</b>	<b>3,021</b>	<b>-178</b>	<b>-5.3%</b>	<b>-164</b>	<b>-5.1%</b>	
<b>North Dakota</b>								
4 and Under	44,595	48,127	51,007	3,532	7.9%	2,880	6.0%	
5 to 9	40,076	47,096	49,303	7,020	17.5%	2,207	4.7%	
10 to 14	39,790	46,966	50,318	7,176	18.0%	3,352	7.1%	
15 to 19	47,474	48,817	53,639	1,343	2.8%	4,822	9.9%	
20 to 24	58,956	59,025	58,870	69	0.1%	-155	-0.3%	
<b>Total</b>	<b>230,891</b>	<b>250,031</b>	<b>263,137</b>	<b>19,140</b>	<b>8.3%</b>	<b>13,106</b>	<b>5.2%</b>	

Sources: U.S. Census Bureau; ESRI; Maxfield Research and Consulting, LLC.

Table 3.1.3 – 2010 to 2025 Barnes County and Incorporated Jurisdictions Age Distribution: Older Adult (65+)

OLDER ADULT (65+) POPULATION AGE DISTRIBUTION BARNES COUNTY, NORTH DAKOTA 2010 to 2025							
Age	Historical	Current	Projection	Change			
	2010	2020	2025	2010 - 2020		2020 - 2025	
65 to 69	562	859	876	297	52.8%	17	2.0%
70 to 74	473	667	807	194	41.0%	140	21.0%
75 to 79	413	466	599	53	12.8%	133	28.5%
80 to 84	315	332	381	17	5.4%	49	14.8%
85 +	407	435	440	28	6.9%	5	1.1%
Total 65+	2,170	2,759	3,103	589	27.1%	344	12.5%
Total 75+	1,135	1,233	1,420	98	8.6%	187	15.2%
<b>Tot. Pop.</b>	<b>11,066</b>	<b>10,640</b>	<b>10,928</b>	<b>-426</b>	<b>-3.8%</b>	<b>288</b>	<b>2.7%</b>

Sources: U.S. Census Bureau; ESRI.; Maxfield Research and Consulting, LLC.

OLDER ADULT (65+) POPULATION AGE DISTRIBUTION VALLEY CITY, NORTH DAKOTA 2010 to 2025							
Age	Historical	Current	Projection	Change			
	2010	2020	2025	2010 - 2020		2020 - 2025	
65 to 69	320	452	450	132	41.3%	-2	-0.4%
70 to 74	289	370	431	81	28.0%	61	16.5%
75 to 79	283	299	341	16	5.7%	42	14.0%
80 to 84	223	229	248	6	2.7%	19	8.3%
85 +	332	344	341	12	3.6%	-3	-0.9%
Total 65+	1,447	1,694	1,811	247	17.1%	117	6.9%
Total 75+	838	872	930	34	4.1%	58	6.7%
<b>Tot. Pop.</b>	<b>6,585</b>	<b>6,544</b>	<b>6,375</b>	<b>-41</b>	<b>-0.6%</b>	<b>-169</b>	<b>-2.6%</b>

Sources: U.S. Census Bureau; ESRI.; Maxfield Research and Consulting, LLC.

OLDER ADULT (65+) POPULATION AGE DISTRIBUTION BARNES COUNTY, NORTH DAKOTA 2010 to 2025							
Age	Historical	Current	Projection	Change			
	2010	2020	2025	2010 - 2020		2020 - 2025	
65 to 69	562	859	876	297	52.8%	17	2.0%
70 to 74	473	667	807	194	41.0%	140	21.0%
75 to 79	413	466	599	53	12.8%	133	28.5%
80 to 84	315	332	381	17	5.4%	49	14.8%
85 +	407	435	440	28	6.9%	5	1.1%
Total 65+	2,170	2,759	3,103	589	27.1%	344	12.5%
Total 75+	1,135	1,233	1,420	98	8.6%	187	15.2%
<b>Tot. Pop.</b>	<b>11,066</b>	<b>10,640</b>	<b>10,928</b>	<b>-426</b>	<b>-3.8%</b>	<b>288</b>	<b>2.7%</b>

Sources: U.S. Census Bureau; ESRI.; Maxfield Research and Consulting, LLC.

Table 3.1.4 – 2010 to 2020 Barnes County and Incorporated Jurisdictions Household Type

HOUSEHOLD TYPE												
VALLEY CITY, REMAINDER OF BARNES COUNTY, BARNES COUNTY, & NORTH DAKOTA												
2010 & 2020												
Households	Total HH's		Family Households						Non-Family Households			
			Married w/ Child		Married w/o Child		Other *		Living Alone		Roommates **	
	2010	2020	2010	2020	2010	2020	2010	2020	2010	2020	2010	2020
<b>Valley City</b>	<b>2,986</b>	<b>2,978</b>	<b>418</b>	<b>414</b>	<b>809</b>	<b>793</b>	<b>336</b>	<b>216</b>	<b>1,177</b>	<b>1,302</b>	<b>246</b>	<b>253</b>
Remainder of Barnes County	1,840	1,934	427	380	800	785	137	180	411	486	65	103
Barnes County	4,826	4,814	845	773	1,609	1,537	473	386	1,588	1,767	311	351
State of North Dakota	281,192	333,614	52,438	60,229	84,084	102,387	34,394	38,729	88,563	103,258	21,713	29,010
<b>Percent</b>												
<b>Valley City</b>	<b>100.0%</b>	<b>100.0%</b>	<b>14.0%</b>	<b>13.9%</b>	<b>27.1%</b>	<b>26.6%</b>	<b>11.3%</b>	<b>7.2%</b>	<b>39.4%</b>	<b>43.7%</b>	<b>8.2%</b>	<b>8.5%</b>
Remainder of Barnes County	100.0%	100.0%	23.2%	19.6%	43.5%	40.6%	7.4%	9.3%	22.3%	25.1%	3.5%	5.3%
Barnes County	100.0%	100.0%	17.5%	16.1%	33.3%	31.9%	9.8%	8.0%	32.9%	36.7%	6.4%	7.3%
State of North Dakota	100.0%	100.0%	18.6%	18.1%	29.9%	30.7%	12.2%	11.6%	31.5%	31.0%	7.7%	8.7%
	<b>Change 2010-2020</b>											
	<b>No.</b>	<b>Pct.</b>	<b>No.</b>	<b>Pct.</b>	<b>No.</b>	<b>Pct.</b>	<b>No.</b>	<b>Pct.</b>	<b>No.</b>	<b>Pct.</b>	<b>No.</b>	<b>Pct.</b>
<b>Valley City</b>	<b>-8</b>	<b>-0.3%</b>	<b>-4</b>	<b>-0.9%</b>	<b>-16</b>	<b>-1.9%</b>	<b>-120</b>	<b>-35.9%</b>	<b>125</b>	<b>10.6%</b>	<b>7</b>	<b>2.9%</b>
Remainder of Barnes County	94	5.1%	-47	-11.1%	-15	-1.8%	43	31.5%	75	18.3%	38	58.0%
Barnes County	-12	-0.2%	-72	-8.5%	-72	-4.5%	-87	-18.3%	179	11.2%	40	12.9%
State of North Dakota	52,422	18.6%	7,791	14.9%	18,303	21.8%	4,335	12.6%	14,695	16.6%	7,297	33.6%
* Single-parents with children												
** Includes unmarried couples without children and group quarters												
Sources: U. S. Census; ESRI, Inc.; Maxfield Research and Consulting, LLC.												

Table 3.1.5 – 2010 to 2020 Barnes County and Incorporated Jurisdictions Households with Children

HOUSEHOLDS WITH & WITHOUT CHILDREN VALLEY CITY, REMAINDER OF BARNES COUNTY, BARNES COUNTY & NORTH DAKOTA 2010 & 2020						
<i>Households</i>	Total HH's		Households With Children		Households Without Children	
	2010	2020	2010	2020	2010	2020
<b>Valley City</b>	<b>2,986</b>	<b>2,978</b>	<b>646</b>	<b>520</b>	<b>2,340</b>	<b>2,458</b>
Remainder of Barnes County	1,840	1,836	501	455	1,339	1,381
Barnes County	4,826	4,814	1,147	974	3,679	3,840
State of North Dakota	281,192	333,614	73,482	85,686	207,710	247,928
<i>Percent</i>						
<b>Valley City</b>	<b>100.0%</b>	<b>100.0%</b>	<b>21.6%</b>	<b>17.4%</b>	<b>78.4%</b>	<b>82.6%</b>
Remainder of Barnes County	100.0%	100.0%	27.2%	24.8%	72.8%	75.2%
Barnes County	100.0%	100.0%	23.8%	20.2%	76.2%	79.8%
State of North Dakota	100.0%	100.0%	26.1%	25.7%	73.9%	74.3%
<b>Change 2010-2020</b>						
	<b>No.</b>	<b>Pct.</b>	<b>No.</b>	<b>Pct.</b>	<b>No.</b>	<b>Pct.</b>
<b>Valley City</b>	<b>-8</b>	<b>-0.3%</b>	<b>-126</b>	<b>-19.6%</b>	<b>118</b>	<b>5.1%</b>
Remainder of Barnes County	-4	-0.2%	-46	-9.3%	42	3.2%
Barnes County	-12	-0.2%	-173	-15.1%	161	4.4%
State of North Dakota	52,422	18.6%	12,204	16.6%	40,218	19.4%

Sources: U. S. Census; ESRI, Inc.; Maxfield Research and Consulting, LLC.



**Table 3.1.6 – 2018 Barnes County Concentrated Poverty**

<b>CONCENTRATED POVERTY</b> <b>VALLEY CITY, REMAINDER OF BARNES COUNTY, BARNES COUNTY, &amp; NORTH DAKOTA</b> <b>2018</b>				
	Valley City	Remainder of Barnes County	Barnes County	State of North Dakota
Total Population for whom Poverty Status is Determined	5,971	4,317	10,288	727,322
Number Below Poverty Level	683	397	1,080	79,270
Percent Below Poverty Level	11.4%	9.2%	10.5%	10.9%

Sources: 2014-2018 U.S. Census Bureau; American Community Survey; Maxfield Research & Consulting, LLC.

Table 3.1.7 – 2020 Barnes County and Incorporated Jurisdictions Disability by Type

DISABILITY BY TYPE VALLEY CITY & BARNES COUNTY 2020		
Valley City		
Type of Disability	Total Number with Disability	Percent with Disability
Hearing Difficulty	324	5.3%
Vision Difficulty	322	5.3%
Cognitive Difficulty	383	6.3%
Ambulatory Difficulty	520	8.5%
Self-Care Difficulty	131	2.1%
Independent Living Difficulty	270	4.4%
<b>Valley City Total Population*</b>	<b>Total Number with a Disability</b>	<b>Percent with a disability</b>
6,112	1,318	21.6%
Barnes County		
Type of Disability	Total Number with Disability	Percent with Disability
Hearing Difficulty	537	5.2%
Vision Difficulty	384	3.7%
Cognitive Difficulty	512	4.9%
Ambulatory Difficulty	729	7.0%
Self-Care Difficulty	215	2.1%
Independent Living Difficulty	407	3.9%
<b>Barnes County Total Population*</b>	<b>Total Number with a Disability</b>	<b>Percent with a Disability</b>
10,361	1,818	17.5%
*Total population is composed of the non institutionalized population so is less than the overall total population.		
Sources: U.S. Census Bureau - American Community Survey; Maxfield Research and Consulting, LLC.		

Table 3.1.8 – 2010 to 2018 Barnes County and Incorporated Jurisdictions Languages Spoken at Home

LANGUAGE SPOKEN AT HOME FOR POPULATION FIVE YEARS OF AGE & OLDER VALLEY CITY, REMAINDER OF BARNES COUNTY, BARNES COUNTY, & STATE OF NORTH DAKOTA 2010 & 2018												
	Spanish		Other Indo European Languages		Asian & Pacific Island Languages		Other Languages		Language Other Than English (Totals)		Only English	
	2010	2018	2010	2018	2010	2018	2010	2018	2010	2018	2010	2018
<b>Number</b>												
Valley City	73	31	136	75	127	42	0	61	336	209	6,086	5,973
Remainder of Barnes County	28	43	38	56	0	0	5	0	71	99	3,957	4,019
Barnes County	101	74	174	131	127	42	5	61	407	308	10,043	9,992
State of North Dakota	8,183	12,684	17,402	16,774	3,611	5,222	3,924	7,878	33,120	42,558	618,066	656,823
<b>Percentage</b>												
Valley City	1.1%	0.5%	2.1%	1.2%	2.0%	0.7%	0.0%	1.0%	5.2%	3.4%	94.8%	96.6%
Remainder of Barnes County	0.7%	1.0%	0.9%	1.4%	0.0%	0.0%	0.1%	0.0%	1.8%	2.4%	98.2%	97.6%
Barnes County	1.0%	0.7%	1.7%	1.3%	1.2%	0.4%	0.0%	0.6%	3.9%	3.0%	96.1%	97.0%
State of North Dakota	1.3%	1.8%	2.7%	2.4%	0.6%	0.7%	0.6%	1.1%	5.1%	6.1%	94.9%	93.9%
Note: In 2010 the Spanish Category also included Spanish Creole. Sources: U.S. Census Bureau; Maxfield Research and Consulting, LLC.												

Table 3.1.9 – 2020 Barnes County and the City of Valley City Pet Ownership

<b>PET OWNERSHIP BY NUMBER OF HOUSEHOLDS</b> <b>VALLEY CITY, REMAINDER OF BARNES COUNTY, BARNES COUNTY, &amp; NORTH DAKOTA</b> <b>2020</b>				
	Valley City	Remainder of Barnes County	Barnes County	North Dakota
<b>Total Number of Households</b>	2,978	1,934	4,912	333,614
<b>Number of Households Not Owning a Pet</b>	1,484	537	2,021	137,113
<b>Number of Households Owning a Pet</b>	1,494	1,397	2,891	196,501
Number of Households Owning a Dog	1,074	1,117	2,191	150,152
Number of Households Owning a Cat	697	880	1,577	95,316

Sources: ESRI; Maxfield Research & Consulting, LLC.

<b>PET OWNERSHIP BY PERCENTAGE</b> <b>VALLEY CITY, REMAINDER OF BARNES COUNT, &amp; BARNES COUNTY</b> <b>2020</b>				
	Valley City	Remainder of Barnes County	Barnes County	North Dakota
<b>Percentage of Households Not Owning a Pet</b>	49.8%	27.8%	41.1%	41.1%
<b>Percentage of Households Owning a Pet</b>	50.2%	72.2%	58.9%	58.9%
Percentage of Households Owning a Dog	36.1%	57.8%	44.6%	45.0%
Percentage of Households Owning a Cat	23.4%	45.5%	32.1%	28.6%

Sources: ESRI; Maxfield Research & Consulting, LLC.

## 4. Threat and Hazard Identification and Risk Assessment (THIRA)

Barnes County has a history of damages to crops, livestock, people and property from natural hazards and man-made threats. In the updating of this plan, the Steering Committee, subject-matter experts (SMEs), jurisdictions, and county and city officials identified 14 natural hazards and man-made threats to be included and analyzed in this plan because risk analysis showed that mitigation, planning, response, and preparedness would assist in limiting injury, loss of life, and loss of property.

The following sections of this chapter detail the risk assessment for Barnes County, North Dakota for each of the 14 natural hazards and man-made threats.

The 14 natural hazards and man-made threats are:

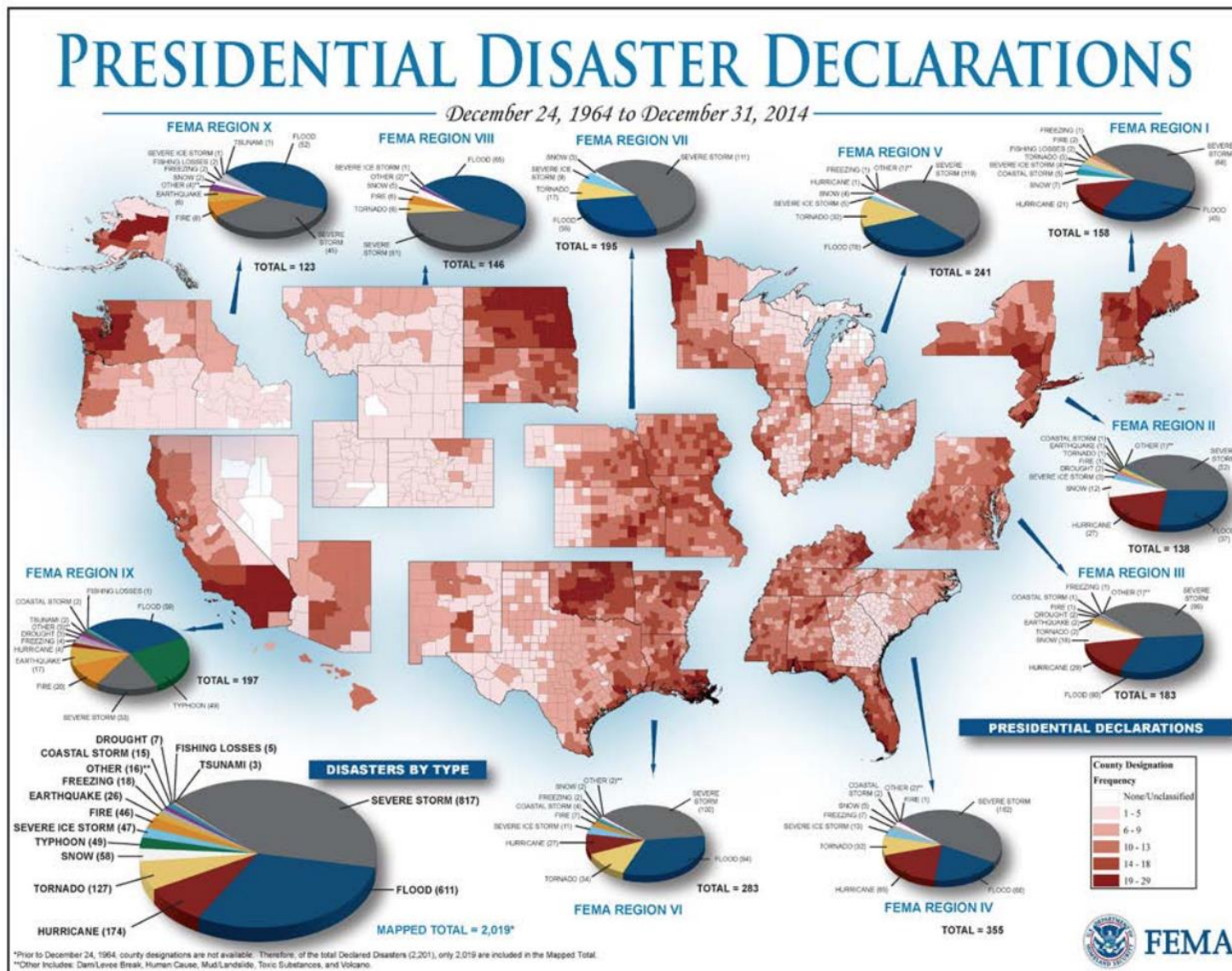
- Civil Disturbance
- Criminal, Terrorist or Nation-State Attack
- Cyberattack
- Dam Failure
- Drought
- Fire (Urban/Structure and Wildland)
- Flood (Overland and Riverine)
- Geologic Hazards
- Hazardous Material Release
- Infectious Disease – Animal, Human & Plant
- Severe Summer Weather
- Severe Winter Weather
- Space Weather
- Transportation Incident

Barnes County history illustrates a considerable risk of damage from disasters. The FEMA Presidential Disaster Declaration map in Figure 4.1 shows that North Dakota, particularly counties in eastern and central portions of the state, are among areas in the nation with the most presidential disaster declarations in the past 50+ years. The frequency of declarations for severe summer and winter storms, and flooding, highlight the need for continued mitigation in Barnes County pertaining to these disasters.

Since 1953, Barnes County has had 30 Presidential Disaster Declarations. Table 4.1 shows that the declarations for Barnes County include drought, flooding, ice jams, ground saturation, snow melt, severe storms, and tornadoes. These declarations highlight the hazards that will result in losses in Barnes County, and the value of mitigation to reduce and/or eliminate losses to people and property. The following are key points.

- Barnes County has been impacted by 18 flood, nine severe storm(s), two biological emergencies, and one coastal storm (Hurricane Katrina Evacuation) since 1953 for a total of 30 declared disasters. Flooding accounts for or is a factor in approximately 76 percent of disasters declared in Barnes County.
- Of the 30 disaster declarations involving Barnes County, 83 percent (25 disasters) have occurred between the months of March and July of any given year.
- No disasters declarations in the months of October, November, or December in Barnes County.
- The COVID-19 Pandemic and Flooding were the most recent Presidential Disaster Declarations for Barnes County occurring in 2020.

Figure 4.1 – December 24, 1964, to December 31, 2014, Presidential Disaster Declaration Frequency by FEMA Region



Source: Federal Emergency Management Agency

**Table 4.1 – 1953 to 2020 Barnes County, North Dakota Presidential Disaster Declarations**

Year	Disaster Description/Title	Disaster Number
1965	Flooding	195
1966	Flooding	216
1969	Flooding	256
1975	Flooding From Rains & Snowmelt	469
1975	Severe Storms & Flooding	475
1979	Severe Storms, Snowmelt & Flooding	581
1993	Severe Storms & Flooding	1001
1994	Severe Storms, Flooding	1032
1995	Severe Storms, Flooding, and Ground Saturation	1050
1996	Severe Storms, Flooding, & Ice Jams	1118
1997	Severe Flooding, Severe Winter Storms, Snowmelt, Spring Rains	1174
1997	Severe Winter Storms and Blizzard Conditions	1157
1998	Flooding, Ground Saturation, Severe Storms	1220
1999	Severe Storms, Flooding, Snow, Ice, Ground Saturation, Landslides, Mudslides, and Tornadoes	1279
2000	Severe Storms, Flooding, and Ground Saturation	1334
2001	Severe Storms, Flooding, & Ground Saturation	1376
2003	Severe Storms and High Winds	1483
2005	Hurricane Katrina Evacuation	3247
2007	Severe Storms & Flooding	1713
2009	Severe Storms & Flooding	1829
2010	Flooding	1907
2010	Flooding	3309
2010	Severe Winter Storm	1879
2011	Flooding	1981
2011	Flooding	3318
2019	Flooding	4444
2020	COVID-19	3477
2020	COVID-19 Pandemic	4509
2020	Flooding	4475
2020	Flooding	4553

Source: FEMA

### Threat and Hazard Identification Risk Assessment (THIRA) Methodology

A risk assessment is process that collects information on the risk of natural hazards and man-made threats to incorporated jurisdictions, and assigns values to those risks to assist with:

1. Identifying and/or comparing courses of action
2. Developing priorities for future mitigation
3. Inform decision-making on creating a local mitigation strategy

The risk assessment provides factual basis for the proposed mitigation actions found in Chapter 6, Mitigation Strategy. An effective risk assessment helps create proposed mitigation actions by focusing resources on greatest potential risk. The risk assessment was conducted using the scoring and ranking process found on the following page. **The resulting risk assessment score for each natural hazard and man-made threat is prioritized as follows: 1 to 5 is low, 6 to 10 is medium, and 11 to 15 is high.**

**Impact** is what damage or losses the hazard causes in a community.

Scored 1	Negligible – less than 10% of the jurisdiction/people affected
Scored 2	Limited – 10% to 25% of jurisdiction/people affected
Scored 3	Critical – 25% to 50% of the jurisdiction/people affected
Scored 4	Catastrophic – More than 50% of the jurisdiction/people affected

**Impact** per hazard: Ranked \_\_\_\_\_. Why:

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**Frequency** is how often the hazard occurs.

Scored 1	Unlikely – history of events shows less than 1% annual occurrence
Scored 2	Possible – history of events shows between 1% to 10% annual occurrence
Scored 3	Likely – history of events shows between 10% to 100% annual occurrence
Scored 4	Highly likely – history of events shows 100% annual occurrence

**Frequency** per hazard: Ranked \_\_\_\_\_. Why:

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**Likelihood** is how probable it is that the hazard will happen.

Scored 1	Unlikely – less than 1% chance hazard will occur annually
Scored 2	Possible – 1% to 10% chance hazard will occur annually
Scored 3	Likely – 10% to 100% chance hazard will occur annually
Scored 4	Highly likely – Nearly 100% chance hazard will occur annually

**Likelihood** per hazard: Ranked \_\_\_\_\_. Why:

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**Vulnerability** is the amount of:

1. Vulnerable areas: trailer courts, building construction, and blocked roads, etc.
2. Vulnerable population(s): individuals with special needs, elderly, day cares, and schools, etc.
3. Resources: equipment, services, or lack thereof that increases or decreases vulnerability

Who and what is affected? When and why? Identify specific areas of vulnerability. What you have or lack: equipment, vehicles, services available, shelters, buildings, and infrastructure.

Scored 1	Low vulnerability: Adequate resources in the jurisdiction to address any hazard
Scored 2	Moderate vulnerability: Various resources in the jurisdiction
Scored 3	High vulnerability: Few resources in the jurisdiction
Scored 4	Very high vulnerability: Little to no resources in the jurisdiction

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**Capability** is the ability to protect itself against the hazard with resources (i.e., buildings, infrastructure, equipment, personnel, plans, technical, financial/tax base)

Scored 1	Low capability: Little to no ability of the jurisdiction for mitigation
Scored 2	Moderate capability: Few abilities of the jurisdiction for mitigation
Scored 3	High capability: Various abilities of the jurisdiction for mitigation
Scored 4	Very high capability: Adequate abilities of the jurisdiction for mitigation

**Capability** per hazard: Ranked \_\_\_\_\_. Why:

**The formula to determine the total is: Impact plus Frequency plus Likelihood plus Vulnerabilities minus Capabilities equals Total. Higher total scores indicate more vulnerability and lower scores indicate less vulnerability.**



Table 4.2 summarizes the risk assessment scoring of the natural hazards and man-made threats for Barnes County and incorporated city jurisdictions, and is also shown in Chapter 8, Jurisdictions.

**Table 4.2 – Barnes County Jurisdiction Risk Assessment Scoring Summary**

<b>Risk Assessment</b>		<b>Jurisdiction: Barnes County, North Dakota</b>				
<u>Hazard/Threat</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<b>Total</b>
Civil Disturbance						
Criminal, Terrorist or Nation-State Attack						
Cyberattack						
Dam Failure						
Drought						
Fire – Urban/Structure Collapse						
Fire – Rural and Wildland						
Flood						
Geologic Hazard						
Hazardous Material Release						
Infectious Disease – Human						
Infectious Disease – Animal & Plant						
Severe Summer Weather						
Severe Winter Weather						
Space Weather						
Transportation Accident						

<b>Risk Assessment</b>		<b>Jurisdiction: City of Dazey, North Dakota</b>				
<u>Hazard/Threat</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<b>Total</b>
Civil Disturbance						
Criminal, Terrorist or Nation-State Attack						
Cyberattack						
Dam Failure						
Drought						
Fire – Urban/Structure Collapse						
Fire – Rural and Wildland						
Flood						
Geologic Hazard						
Hazardous Material Release						
Infectious Disease						
Severe Summer Weather						
Severe Winter Weather						
Space Weather						
Transportation Accident						

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

**Table 4.2 – Barnes County Jurisdiction Risk Assessment Scoring Summary - Continued**

<b>Risk Assessment</b>		<b>Jurisdiction: City of Fingal, North Dakota</b>				
<u>Hazard/Threat</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<b>Total</b>
Civil Disturbance						
Criminal, Terrorist or Nation-State Attack						
Cyberattack						
Dam Failure						
Drought						
Fire – Urban/Structure Collapse						
Fire – Rural and Wildland						
Flood						
Geologic Hazard						
Hazardous Material Release						
Infectious Disease						
Severe Summer Weather						
Severe Winter Weather						
Space Weather						
Transportation Accident						

<b>Risk Assessment</b>		<b>Jurisdiction: City of Kathryn, North Dakota</b>				
<u>Hazard/Threat</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<b>Total</b>
Civil Disturbance						
Criminal, Terrorist or Nation-State Attack						
Cyberattack						
Dam Failure						
Drought						
Fire – Urban/Structure Collapse						
Fire – Rural and Wildland						
Flood						
Geologic Hazard						
Hazardous Material Release						
Infectious Disease						
Severe Summer Weather						
Severe Winter Weather						
Space Weather						
Transportation Accident						

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 4.2 – Barnes County Jurisdiction Risk Assessment Scoring Summary - Continued

Risk Assessment		Jurisdiction: City of Leal, North Dakota				
Hazard/Threat	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Civil Disturbance						
Criminal, Terrorist or Nation-State Attack						
Cyberattack						
Dam Failure						
Drought						
Fire – Urban/Structure Collapse						
Fire – Rural and Wildland						
Flood						
Geologic Hazard						
Hazardous Material Release						
Infectious Disease						
Severe Summer Weather						
Severe Winter Weather						
Space Weather						
Transportation Accident						

Risk Assessment		Jurisdiction: City of Litchville, North Dakota				
Hazard/Threat	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Civil Disturbance						
Criminal, Terrorist or Nation-State Attack						
Cyberattack						
Dam Failure						
Drought						
Fire – Urban/Structure Collapse						
Fire – Rural and Wildland						
Flood						
Geologic Hazard						
Hazardous Material Release						
Infectious Disease						
Severe Summer Weather						
Severe Winter Weather						
Space Weather						
Transportation Accident						

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

**Table 4.2 – Barnes County Jurisdiction Risk Assessment Scoring Summary - Continued**

<b>Risk Assessment</b>		<b>Jurisdiction: City of Nome, North Dakota</b>				
<u>Hazard/Threat</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<b>Total</b>
Civil Disturbance						
Criminal, Terrorist or Nation-State Attack						
Cyberattack						
Dam Failure						
Drought						
Fire – Urban/Structure Collapse						
Fire – Rural and Wildland						
Flood						
Geologic Hazard						
Hazardous Material Release						
Infectious Disease						
Severe Summer Weather						
Severe Winter Weather						
Space Weather						
Transportation Accident						

<b>Risk Assessment</b>		<b>Jurisdiction: City of Oriska, North Dakota</b>				
<u>Hazard/Threat</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<b>Total</b>
Civil Disturbance						
Criminal, Terrorist or Nation-State Attack						
Cyberattack						
Dam Failure						
Drought						
Fire – Urban/Structure Collapse						
Fire – Rural and Wildland						
Flood						
Geologic Hazard						
Hazardous Material Release						
Infectious Disease						
Severe Summer Weather						
Severe Winter Weather						
Space Weather						
Transportation Accident						

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

**Table 4.2 – Barnes County Jurisdiction Risk Assessment Scoring Summary - Continued**

<b>Risk Assessment</b>		<b>Jurisdiction: City of Pillsbury, North Dakota</b>				
<u>Hazard/Threat</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<b>Total</b>
Civil Disturbance						
Criminal, Terrorist or Nation-State Attack						
Cyberattack						
Dam Failure						
Drought						
Fire – Urban/Structure Collapse						
Fire – Rural and Wildland						
Flood						
Geologic Hazard						
Hazardous Material Release						
Infectious Disease						
Severe Summer Weather						
Severe Winter Weather						
Space Weather						
Transportation Accident						

<b>Risk Assessment</b>		<b>Jurisdiction: City of Rogers, North Dakota</b>				
<u>Hazard/Threat</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<b>Total</b>
Civil Disturbance						
Criminal, Terrorist or Nation-State Attack						
Cyberattack						
Dam Failure						
Drought						
Fire – Urban/Structure Collapse						
Fire – Rural and Wildland						
Flood						
Geologic Hazard						
Hazardous Material Release						
Infectious Disease						
Severe Summer Weather						
Severe Winter Weather						
Space Weather						
Transportation Accident						

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

**Table 4.2 – Barnes County Jurisdiction Risk Assessment Scoring Summary - Continued**

<b>Risk Assessment</b>		<b>Jurisdiction: City of Sanborn, North Dakota</b>				
<u>Hazard/Threat</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<b>Total</b>
Civil Disturbance						
Criminal, Terrorist or Nation-State Attack						
Cyberattack						
Dam Failure						
Drought						
Fire – Urban/Structure Collapse						
Fire – Rural and Wildland						
Flood						
Geologic Hazard						
Hazardous Material Release						
Infectious Disease						
Severe Summer Weather						
Severe Winter Weather						
Space Weather						
Transportation Accident						

<b>Risk Assessment</b>		<b>Jurisdiction: City of Sibley, North Dakota</b>				
<u>Hazard/Threat</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<b>Total</b>
Civil Disturbance						
Criminal, Terrorist or Nation-State Attack						
Cyberattack						
Dam Failure						
Drought						
Fire – Urban/Structure Collapse						
Fire – Rural and Wildland						
Flood						
Geologic Hazard						
Hazardous Material Release						
Infectious Disease						
Severe Summer Weather						
Severe Winter Weather						
Space Weather						
Transportation Accident						

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

**Table 4.2 – Barnes County Jurisdiction Risk Assessment Scoring Summary - Continued**

<b>Risk Assessment</b>		<b>Jurisdiction: City of Valley City, North Dakota</b>				
<u>Hazard/Threat</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<b>Total</b>
Civil Disturbance						
Criminal, Terrorist or Nation-State Attack						
Cyberattack						
Dam Failure						
Drought						
Fire – Urban/Structure Collapse						
Fire – Rural and Wildland						
Flood						
Geologic Hazard						
Hazardous Material Release						
Infectious Disease						
Severe Summer Weather						
Severe Winter Weather						
Space Weather						
Transportation Accident						

<b>Risk Assessment</b>		<b>Jurisdiction: City of Wimbledon, North Dakota</b>				
<u>Hazard/Threat</u>	<u>Impact</u>	<u>Frequency</u>	<u>Likelihood</u>	<u>Vulnerability</u>	<u>Capabilities</u>	<b>Total</b>
Civil Disturbance						
Criminal, Terrorist or Nation-State Attack						
Cyberattack						
Dam Failure						
Drought						
Fire – Urban/Structure Collapse						
Fire – Rural and Wildland						
Flood						
Geologic Hazard						
Hazardous Material Release						
Infectious Disease						
Severe Summer Weather						
Severe Winter Weather						
Space Weather						
Transportation Accident						

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 4.3 on the following pages identifies the general impacts associated with each natural hazard and man-made threat. Impacts specific to incorporated jurisdiction is found in each hazard and threat profile in Chapter 4, Threat and Hazard Identification Risk Assessment and Chapter 8, Jurisdictions.

Table 4.3 – Impacts of Natural Hazards and Man-made Threats

Impact	Civil Disturbance	Criminal, Terrorist or Nation-State Attack	Cyberattack	Dam Failure	Drought	Fire – Urban	Fire – Wildland	Flood	Geologic Hazard	Hazardous Material Release	Infectious Disease	Severe Summer Weather	Severe Winter Weather	Space Weather	Transportation Incident
Blocked Roads	X	X		X		X	X	X	X	X		X	X		X
Building Collapse	X	X		X		X	X	X	X			X	X		
Business Interruptions	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Crop Loss		X		X	X		X	X		X	X	X	X		
Delayed Emergency Response	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Disease Outbreak/Mass Infections	X	X		X	X			X			X	X	X		X
Downed Power Lines	X	X		X		X	X	X	X	X		X	X		X
Downed Trees				X	X	X	X	X	X			X	X		
Environmental Degradation	X	X		X	X		X	X	X	X	X	X	X		X
Evacuation (Full)	X	X	X	X		X	X	X		X	X	X	X		X
Evacuation (Localized)	X	X	X	X	X	X	X	X	X	X	X	X	X		X
Explosion	X	X	X	X		X	X	X		X		X	X	X	X
Financial Hardship (Private)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Financial Hardship (Public)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Flooding (Street)				X				X				X	X		
Flooding (Structure)				X				X				X	X		
Fuel Outage/Shortage	X	X	X	X	X	X	X	X	X	X		X	X		X
Government Interruptions	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
HAZMAT Release	X	X	X	X	X	X	X	X	X	X		X	X	X	X
Human Injury/Death	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Increased Fire Potential	X	X	X	X	X	X	X	X	X	X		X	X	X	X
Increased Public Safety Runs	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Infrastructure Degradation	X	X	X	X	X	X	X	X	X	X		X	X	X	X



Table 4.3 – Impacts of Natural Hazards and Man-made Threats – Continued

Impact	Civil Disturbance	Criminal, Terrorist or Nation-State Attack	Cyberattack	Dam Failure	Drought	Fire – Urban	Fire – Wildland	Flood	Geologic Hazard	Hazardous Material Release	Infectious Disease	Severe Summer Weather	Severe Winter Weather	Space Weather	Transportation Incident
Labor Shortages	X	X	X	X		X	X	X		X	X	X	X	X	X
Livestock Injury/Death	X	X		X	X		X	X	X	X	X	X	X		X
Loss of Communications	X	X	X	X		X	X	X		X		X	X	X	X
Loss of Digital/Technological Systems	X	X	X	X	X	X	X	X	X	X		X	X	X	X
Loss of Economy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Loss/Overcrowded Medical Facilities	X	X	X	X	X	X	X	X		X	X	X	X	X	X
Loss/Overcrowded Veterinarian Facilities		X	X	X	X	X	X	X		X	X	X	X	X	
Loss of Potable Water		X	X	X	X			X	X	X	X	X	X	X	X
Loss of Power/Electricity Outage		X	X	X		X	X	X	X	X		X	X	X	
Loss of Transportation/Accessibility	X	X	X	X			X	X	X	X		X	X	X	X
Loss of Wildlife Habitat				X	X		X	X	X	X	X	X	X		
Mass Casualties	X	X	X	X		X	X	X	X	X	X	X	X	X	X
Mass Fatalities	X	X	X	X		X	X	X	X	X	X	X	X	X	X
Property Damage (Structure)	X	X	X	X	X	X	X	X	X	X		X	X	X	X
Property Damage (Equipment & Vehicle)	X	X	X	X	X	X	X	X	X	X		X	X	X	X
Public Distress/Social Discord	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
School Closure	X	X	X	X		X	X	X		X	X	X	X	X	X
Sewer Backup		X	X	X				X	X			X	X	X	
Sheltering of Displaced Populations	X	X		X		X	X	X	X	X	X	X	X	X	X
Soil Degradation/Erosion	X	X		X	X		X	X	X	X	X	X	X		X
Utility Outage/Shortage	X	X	X	X	X	X	X	X	X	X		X	X	X	X
Wildlife Injury/Death	X			X	X		X	X	X	X	X	X	X		X

## 4.1 Civil Disturbance

Including events arising due to political grievances, economic disputes or social discord, terrorism, or foreign agitators.

### Characteristics

A civil disturbance is activity from large groups, organizations, or distraught individuals with potentially disastrous or disruptive results.

<b>Seasonal Pattern</b>	None. Extreme winter weather can limit or eliminate activity altogether.
<b>Duration</b>	Minutes/hours/days/weeks/months/potentially a year or more.
<b>Speed of Onset</b>	Little to no warning or several days/weeks.
<b>Location</b>	Total geographic extent of Barnes County – most likely targeting critical facilities such as the Barnes County Correctional Center, Barnes County Courthouse, Barnes County Law Enforcement Center, Barnes County Highway Department, City-County Health, Valley City City Hall and public works buildings, Valley City Police Department, CHI Mercy Health Valley City, Valley City State University, state and federal agencies located in Barnes County, and public school districts, or infrastructure such as the Baldhill Dam, and chemical, energy, or oil and gas infrastructure. Culturally and environmentally sensitive areas can also be a target.

For more information regarding civil disturbance please reference the **2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)**. The state plan can be accessed by following the electronic hyperlink or link to the N.D. Dept. of Emergency Services website:

[2018 North Dakota Enhanced Mitigation Mission Area Operations Plan](#)

<https://www.des.nd.gov/planning>

### History

The following information on incidents of civil disturbance in Barnes County was provided by the Valley City Police Department, Barnes County Emergency Management, and the Barnes County Sheriff’s Office.

#### Valley City Police Department and Barnes County Sheriff’s Office

- Starting in beginning of 2020, a resident of Valley City “protests” daily at the Valley City Police Department. Local law enforcement indicated the individual has been arrested in the past. The individual has a condition of bond to maintain a specific distance from the adjacent “Thrifty Shop” that provides services and employment opportunities to people with special needs. The individual has assaulted people in front of the police department building.

#### Barnes County Emergency Management

One significant civil disturbance event occurred in North Dakota that garnered national and international attention and activated mutual aid with Barnes County law enforcement agencies.

- **Dakota Access Pipeline (DAPL).** The protest began when a 1,134-mile-long crude oil pipeline was proposed for installation across North Dakota and several other states, traversing under the Missouri River near the Standing Rock-Sioux Tribe Indian Reservation. The protest began as a peaceful and environmental-focused event but transitioned into a seven-month long unlawful protest on August 10, 2016, when individuals attempted to block access to construction activities associated with the pipeline. The protest resulted in acts of trespassing, vandalism, riots, fires set to hay bales and tires, intimidation tactics directed at local landowners as well as law enforcement and their families, poaching, theft, and killing of local livestock and other animals. Approximately 709 protesters were arrested during the event. It is estimated that up to 10,000 people attended the protest at its peak.

**There have been no disaster declarations or emergencies pertaining to a civil disturbance in Barnes County.**

### **Probability**

The probability of a hazard or threat is how likely it is it will happen. Civil disturbances are hard to predict but are most probable at or near large venues and locations of significance such as stadiums, government facilities like the Barnes County Correctional Center, Barnes County Courthouse, Barnes County Law Enforcement Center, or other critical facilities or infrastructure such as Baldhill Dam, CHI Mercy Health Hospital, N.D. Winter Show or Valley City State University.

Profile meeting participants ranked the probability of civil disturbance as possible meaning that there is between a one and 10 percent probability in the next year of an incident. It is likely a civil disturbance will continue to occur at some point in the future in Barnes County and in North Dakota.

### **Extent/Magnitude**

The extent/magnitude of a hazard or threat is expressed in the amount and/or number of damages or losses either actualized in a community or estimated based on known assets and levels of risk. Magnitude of a civil disturbance can vary from a small protest at a government facility or health care clinic to large-scale at industrial sites, state capitols, or culturally sensitive areas and sites. Profile meeting participants ranked the magnitude of a civil disturbance as catastrophic meaning more than 50 percent of the jurisdiction and its people can be affected.

### **Risk Assessment**

Table 4.1.1 shows the risk assessment as determined by individual jurisdictions, the Steering Committee, and meeting participants at the profile meeting for civil disturbance. The risk assessment methodology can be found in the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA). The total in Table 4.1.1 represents the sum of each jurisdiction's impact, frequency, likelihood, and vulnerability to a hazard/threat less the jurisdiction's capabilities to respond to the hazard/threat.

**Table 4.1.1 – Barnes County Civil Disturbance Risk Assessment Scored Chart Summary**

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	4	2	2	3	3	8
City of Dazey	2	1	1	2	1	5
City of Fingal	2	1	1	2	1	5
City of Kathryn	2	1	1	2	1	5
City of Leal	2	1	1	2	1	5
City of Litchville	2	1	1	2	1	5
City of Nome	2	1	1	2	1	5
City of Oriska	2	1	1	2	1	5
City of Pillsbury	2	1	1	2	1	5
City of Rogers	2	1	1	2	1	5
City of Sanborn	2	1	1	2	1	5
City of Sibley	2	1	1	2	1	5
City of Valley City	4	2	2	3	3	8
City of Wimbledon	2	1	1	2	1	5

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 4.1.2 provides information on the specific impact, frequency, likelihood, vulnerability, and capability of civil disturbance in Barnes County. A list of impacts identified as commonplace for natural hazards and man-made threats regardless of the jurisdiction is shown at the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA).

**Vulnerabilities to Publicly-Owned Buildings and Property**

Publicly-owned buildings and property are vulnerable to civil disturbances as any government building can be targeted. Facilities supporting functions key to daily operations of Barnes County and the city of Valley City, such as the Barnes County Correctional Center, Barnes County Courthouse, Barnes County Law Enforcement Center, Barnes County Highway Department, City-County Health, Valley City City Hall and public works buildings, Valley City Police Department, CHI Mercy Health Valley City, Valley City State University, state and federal agencies located in Barnes County, public school districts or buildings supporting emergency services such as fire and ambulance halls, would be the most vulnerable to a civil disturbance. **The level of vulnerability depends on the activities performed at a specific facility or level of security at the facility.**

A summary of city and publicly-owned buildings is provided in Chapter 3, Profile and Inventory.

**Vulnerabilities of Critical Facilities and Infrastructure**

Like publicly-owned buildings and property, the vulnerability of critical facilities and infrastructure to civil disturbance is imminent. CHI Mercy Health Valley City, medical clinics, and electric power, water/wastewater facilities, railroads, and pipelines are critical facilities and infrastructure vulnerable to the threat.

**Table 4.1.2 – Barnes County Civil Disturbance Risk Assessment**

<p><b>Impact</b></p>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Delayed Emergency Response</li> <li>• HAZMAT Release</li> <li>• Human Injury/Death</li> <li>• Increased Public Safety Runs</li> <li>• Loss/Overcrowded Medical Facilities</li> <li>• Loss of Potable Water</li> </ul>	<ul style="list-style-type: none"> <li>• Mass Casualties/Fatalities</li> </ul> <p><b>The following impacts were realized to Barnes County through mutual aid during the DAPL protest between September 2016 and February 2017:</b></p> <ul style="list-style-type: none"> <li>• <b>Personnel Costs: \$1,303.40</b></li> <li>• <b>Food/Lodging Costs: \$163.80</b></li> </ul>
<p><b>Frequency</b></p>	<ul style="list-style-type: none"> <li>• DAPL protest from August 10, 2016, to March 31, 2017, lasting approximately seven+ months</li> </ul>	
<p><b>Likelihood</b></p>	<p><u>More likely</u></p> <ul style="list-style-type: none"> <li>• Presence of pipelines transporting hazardous materials</li> <li>• Increasing hostility and turmoil directed at the energy industry and major corporations</li> <li>• Increasing political turmoil at the federal level</li> <li>• Increase in development of oil and gas infrastructure</li> <li>• Social discord resulting from the COVID-19 pandemic</li> <li>• Barnes County Correctional Center</li> <li>• Valley City State University</li> </ul>	<p><u>Less likely</u></p> <ul style="list-style-type: none"> <li>• Sparse population – non-metropolitan</li> <li>• County not located near a major metropolitan population, international airport, stadiums, or significant tourist attraction</li> <li>• Public safety communications (Public Safety Answering Points)</li> <li>• Barnes County Sheriff’s Office</li> <li>• Valley City Police Department</li> </ul>
<p><b>Vulnerability</b></p>	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> <li>• Presence of pipelines transporting hazardous materials</li> <li>• Increasing hostility and turmoil directed at the energy industry and major corporations</li> <li>• Increasing political turmoil at the federal level</li> <li>• Increase in development of oil and gas infrastructure</li> <li>• Social discord resulting from the COVID-19 pandemic</li> <li>• <b>Funding of extreme groups by “Dark Money” from billionaires and crowd-funding websites</b></li> <li>• Barnes County Correctional Center</li> <li>• Valley City State University</li> <li>• Interstate 94</li> </ul>	<p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> <li>• Sparse population – non-metropolitan</li> <li>• County not located near a major metropolitan population, international airport, stadiums, or a significant tourist attraction</li> <li>• Public safety communications (Public Safety Answering Points)</li> <li>• Lack of major television station in Barnes County</li> <li>• Barnes County Sheriff’s Office &amp; Valley City PD</li> <li>• Barnes County Rural Water District has implemented security measures to protect water supplies</li> </ul>
<p><b>Capability</b></p>	<ul style="list-style-type: none"> <li>• See Chapter 7 for a list of capabilities to address civil disturbance.</li> </ul>	

### **Vulnerabilities to New and Future Development**

Civil disturbances are nearly impossible to predict and, therefore, vulnerabilities to new and future development cannot be determined. However, large influxes of people in a short period of time into sparsely populated areas can be a source of civil disturbance and impact new development. In addition, new and future development that is located at or adjacent to politically or culturally sensitive areas, or constructed near environmentally sensitive areas, may be targeted by a civil disturbance.

### **Data Limitations**

Due to the confidentiality of information pertaining to civil disturbances, law enforcement agencies were limited in the ability to share detailed information about incidents.

### **Other Key Documents**

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following documents.

- 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)
- Barnes County Evacuation and Shelter Plan
- Barnes County Local Emergency Operations Plan
- Barnes County North Emergency Response Plan
- Barnes County Shelter and Mass Care Plan
- Barnes County Threat and Hazard Identification and Risk Assessment (THIRA)
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan, Terrorism Annex
- North Dakota State Disaster Recovery Plan
- North Dakota State Preparedness Report (SPR)
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)
- Valley City Public Schools Emergency Response Plan

## 4.2 Criminal, Terrorist, or Nation-State Attack

Including armed assault, biological, chemical, explosive, food/food production, nuclear, radiological, and vehicular attacks.

### Characteristics

Any intentional adversarial human-caused incident, domestic or international, that causes mass casualties, large economic losses, or widespread panic. Universities, industry, government officials and buildings, power grids, telecommunication systems, dams, water supplies, and pipelines are potential terrorism targets. Another potential terrorist activity that must be considered is violence in the workplace.

<b>Seasonal Pattern</b>	None. More likely during political unrest or social discord.
<b>Duration</b>	Minutes/hours/days/weeks/months/potentially a year or more.
<b>Speed of Onset</b>	Little to no warning or several days/weeks.
<b>Location</b>	Total geographic extent of Barnes County – most likely targeting critical facilities such as the Barnes County Correctional Center, Barnes County Courthouse, Barnes County Law Enforcement Center, Barnes County Highway Department, City-County Health, Valley City City Hall and public works buildings, Valley City Police Department, CHI Mercy Health Valley City, Valley City State University, state and federal agencies located in Barnes County, public school districts, or infrastructure such as the Baldhill Dam, and chemical, energy, or oil and gas infrastructure. Culturally and environmentally sensitive areas can also be a target. Urban neighborhoods are also a target due to population density and the ability to impact a large number of people through diversion/scare tactics.

For more information regarding criminal, terrorist, or Nation-State attack please reference the **2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)**. The state plan can be accessed by following the electronic hyperlink or link to the N.D. Dept. of Emergency Services website:

[2018 North Dakota Enhanced Mitigation Mission Area Operations Plan](#)

<https://www.des.nd.gov/planning>

### History

The following information on incidents of criminal, terrorist, or Nation-State attack in Barnes County was provided by the Barnes County Sheriff's Office, Valley City Police Department, Barnes County Emergency Management, and the 2018 N.D. Enhanced Mitigation MAOP. An expanded electronic version of hazard history data and information are located on a disc at the beginning of Chapter 4.

- In 1994 and 1995, a man by the name of Gordon Winrod and his cult of anti-Semitic followers and family kidnapped six of his grandchildren from the Edgeley area in neighboring LaMoure County and the parking lot at the Buffalo Mall in the city of Jamestown. Dozens of officers from multiple agencies were involved in ground searched and surveillance for several months during those two years. The child from Jamestown was eventually found in Alaska. The Lepperts family residing in Barnes County had ties to Gordon Winrod. Two of the sons in the Lepperts

family were married to Winrod’s daughters. Barnes County Sheriff’s Office responded to multiple calls to the Lepperts farm for child custody disputes in 1996 and 1997.

- **Bald Hill Dam.** A resident of Barnes County threatened to blow up the Baldhill Dam in the 1980s. Barnes County Sheriff’s Office provided enhanced security protection to the dam in response to this threat.
- **Hi-Line Bridge.** In response to the terrorist attacks on September 11, 2001, Barnes County Sheriff’s Office provided enhanced security protection to the BNSF Hi-Line Bridge in Valley City.
- **Railroad Bridge.** A railroad bridge was destroyed by fire in eastern Barnes County approximately seven miles east of Valley City.
- Oral history from county officials and participants at jurisdictional meetings indicated that bomb and other security threats to public schools has occurred over the past decade. No bomb or security threats resulted in an incident.

2018 N.D. Enhanced Mitigation MAOP

According to the 2018 N.D. Enhanced Mitigation MAOP, the following criminal, terrorist, or Nation-State attack events occurred either in Barnes County or nearby. Table 4.2.1 shows vandalism and theft claims paid on critical facilities insured by the state in Barnes County between 1989 and 2018.

- Between January 2014 and October 2018, there have been forty-three Terrorist Screening Center (TSC) hits or encounters within North Dakota, in which the North Dakota SLIC provided support when requested. In the same period, the North Dakota SLIC has received hundreds of suspicious activity reports (SARs), of which two hundred and sixty-six of have been deemed to have a "possible nexus to terrorism.”

**Table 4.2.1 – 1989 to 2018 Vandalism and Theft Claims Paid on Critical Facilities Insured by State**

Jurisdiction	State Agencies	Adjutant General	State Universities	Local Governments	School Districts	Total
Barnes Co.	\$2,206	\$0	\$3,474	\$9,695	\$11,859	\$27,234

Source(s): 2018 N.D. Enhanced Mitigation MAOP; N.D. Department of Emergency Services

- Vandalism and theft claims paid on state facilities and other critical facilities insured by the state since 1989 resulted in \$2,206 paid to state agencies, zero paid to the adjutant general, \$3,474 paid to state universities, \$9,695 paid to local governments, and \$11,859 paid to school districts in Barnes County for a total of \$27,234.

**There have been no disaster declarations or emergencies pertaining to a criminal, terrorist, or Nation-State attack in Barnes County.**

**Probability**

The probability of a hazard or threat is how likely it is it will happen. Criminal, terrorist, or nation-state attacks are hard to predict but are most probable at or near jurisdictions with large, dense populations.



According to the 2018 N.D. Enhanced Mitigation MAOP, Barnes County was 15<sup>th</sup> densest county in North Dakota with 7.4 persons per square mile.

During jurisdictional meetings/workshops and the profile meeting, meeting participants said there is always a chance for an incident to occur at any time and no community is immune to the threat. However, the probability is much lower in jurisdictions without schools since schools in the United States have had numerous incidents over the past three decades.

Profile meeting participants ranked the probability of criminal, terrorist, or nation-state attack as possible meaning that there is between a one and 10 percent probability in the next year of an incident. It is likely a criminal, terrorist, or nation-state attack will occur at some point in the future in Barnes County and in North Dakota.

### **Extent/Magnitude**

The magnitude of a hazard or threat is the expressed in the amount of damage or losses either caused or could occur in a community. Magnitude of a criminal, terrorist, or nation-state attack can vary from a high magnitude event such as one that affects the national or agricultural economy or requires deployment of military personnel and drafting of soldiers, or smaller magnitude events such as specialized attacks on schools or businesses involving active-shooters, homemade bombs and/or hostages. An incident at a school could have a large magnitude.

Food. An adversarial threat to food is the potential for interruption within the production and distribution of food, and the potential for adulteration, obstruction of operation, or intentional damage to a facility or product. If successful, the extent/magnitude of this type of attack could be widespread and result in mass fatalities. With the economy of Barnes County largely based on agriculture and manufacturing, an incident involving the agriculture sector or at a manufacturing facility has the potential to be disastrous and large in magnitude if targeting food or hazardous chemicals. However, the likelihood is low, and the impact would be limited based on food inspection practices and other regulations.

Transportation systems. The most likely scenario would be impacts from an interruption of the transportation system. Transportation systems have far less oversight and regulations than food production and supply chains, and water treatment and infrastructure. This type of attack could impact a substantial area and result in the shutting down of regional commerce. **The BNSF Hi-Line Railroad Bridge traverses over CP Railway infrastructure and the Sheyenne River, in addition to numerous structures in the city of Valley City. An attack on this bridge would result in an incident of catastrophic impacts.**

Infrastructure. The most likely scenario would be targeting the Baldhill Dam north of the city of Valley City or pipelines carrying hazardous materials. A terrorist attack on the Baldhill Dam would most likely involve an explosion or a combination of other materials to inflict serious damage to the structural integrity resulting in imminent failure. This type of attack would result in the evacuation of large portions of the city of Valley City, central and southern Barnes County, and eventual evacuations of communities located further south along the Sheyenne River in North Dakota. An attack on the Baldhill Dam would result in mass casualties, and widespread destruction of the city of Valley City and Barnes County.

A terrorist attack on existing pipelines, energy-related or agriculture-related infrastructure would likely cause a hazardous material release and/or fire and an explosion. The attack may result in significant environmental damage, depending on where the attack occurred and the overall impact to the existing infrastructure. This type of attack may also cause the shutting down of regional commerce that would have a spill-over effect into intrastate and national economic systems.

**Risk Assessment**

Table 4.2.2 shows the risk assessment as determined by individual jurisdictions and the Steering Committee for criminal, terrorist, or nation-state attack. The risk assessment methodology can be found in the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA). The total in Table 4.2.2 represents the sum of each jurisdiction’s impact, frequency, likelihood, and vulnerability to a hazard/threat less the jurisdiction’s capabilities to respond to the hazard/threat.

**Table 4.2.2 – Barnes County Criminal, Terrorist or Nation-State Attack Risk Assessment Scored Chart Summary**

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	4	2	2	4	3	9
City of Dazey	3	1	2	3	1	8
City of Fingal	4	2	3	3	1	11
City of Kathryn	2	2	1	1	2	4
City of Leal	4	2	2	3	2	9
City of Litchville	1	1	1	1	2	2
City of Nome	4	1	1	2	1	7
City of Oriska	2	2	2	2	1	7
City of Pillsbury	2	2	2	2	1	7
City of Rogers	2	2	2	3	1	8
City of Sanborn	4	1	2	4	1	10
City of Sibley	4	2	1	3	1	9
City of Valley City	4	3	3	4	2	12
City of Wimbledon	4	2	2	4	1	11

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 4.2.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of criminal, terrorist, or nation-state attack in Barnes County. A list of impacts identified as commonplace for natural hazards and man-made threats regardless of the jurisdiction is shown at the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA).

Table 4.2.3 – Barnes County Criminal, Terrorist, or Nation-State Attack Risk Assessment

<p><b>Impact</b></p>	<ul style="list-style-type: none"> <li>Blocked Roads</li> <li>Delayed Emergency Response</li> <li>HAZMAT Release</li> <li>Human Injury/Death &amp; Mass Casualties/Fatalities</li> <li>Increased Public Safety Runs</li> <li>Loss of Economy</li> <li>Loss/Overcrowded Medical Facilities</li> </ul>	<ul style="list-style-type: none"> <li>Disruption of services to maintain economic activity and daily life</li> <li>Harm to reputation of the county as a safe place to reside causing damage to economic growth and decline in school enrollments</li> <li>Potential exodus of people resulting in permanent population loss</li> <li><b>Shutting down of regional commerce indefinitely if an attack targets transportation – specifically bridges, dams, railroads</b></li> <li><b>Potential for mass casualties or widespread sickness if water or wastewater infrastructure was targeted</b></li> </ul>
<p><b>Frequency</b></p>	<ul style="list-style-type: none"> <li><u>Bald Hill Dam.</u> A resident of Barnes County threatened to blow up the Baldhill Dam in the 1980s. Barnes County Sheriff’s Office provided enhanced security protection to the dam in response to this threat.</li> </ul>	<ul style="list-style-type: none"> <li><u>Railroad Bridge.</u> A railroad bridge was destroyed by fire in eastern Barnes County approximately seven miles east of Valley City.</li> <li><u>Hi-Line Bridge.</u> In response to the terrorist attacks on September 11, 2001, Barnes County Sheriff’s Office provided enhanced security protection to the BNSF Hi-Line Bridge in Valley City.</li> </ul>
<p><b>Likelihood</b></p>	<p><u>More likely</u></p> <ul style="list-style-type: none"> <li>Increasing political turmoil at the federal level</li> <li>Increasing hostility and turmoil directed at oil and gas industry and major corporations</li> <li>Social media</li> <li>County produces commodities for use locally, nationally, and internationally</li> <li>Presence of BNSF Hi-Line Bridge &amp; Baldhill Dam</li> </ul>	<p><u>Less likely</u></p> <ul style="list-style-type: none"> <li>Sparse population – non-metropolitan area</li> <li>County not located near a major metropolitan population, international airport, stadiums</li> <li>N.D. State and Local Intelligence Center (SLIC)</li> <li>Public safety communications (Public Safety Answering Points)</li> <li>Railroad Law Enforcement – BNSF and CP Railway</li> <li>Barnes County is a “station” for N.D. Highway Patrol</li> </ul>
<p><b>Vulnerability</b></p>	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> <li>Increasing political turmoil at the federal level</li> <li>Increasing hostility and turmoil directed at oil and gas industry and major corporations</li> <li>Social media</li> <li>County produces commodities for use locally, nationally, and internationally</li> <li>Presence of BNSF Hi-Line Bridge &amp; Baldhill Dam</li> <li><b>Limited law enforcement in rural areas of county</b></li> <li><b>Inadequate mental health services in the county</b></li> </ul>	<p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> <li>Sparse population</li> <li>County not located near a major tourist destination</li> <li>N.D. State and Local Intelligence Center (SLIC)</li> <li>Public safety communications (Public Safety Answering Points)</li> <li>Better security has been implemented at public schools</li> <li>Railroad Law Enforcement – BNSF and CP Railway</li> <li>Barnes County is a “station” for N.D. Highway Patrol</li> <li>Security camera systems installed at Barnes County Courthouse, Barnes County Junior-Senior High School, and Barnes County Highway Department</li> </ul>
<p><b>Capability</b></p>	<ul style="list-style-type: none"> <li>See Chapter 7 for a list of capabilities to address criminal, terrorist, or nation-state attack.</li> </ul>	

### **Vulnerabilities to Publicly-Owned Buildings and Property**

Publicly-owned buildings and property are vulnerable to criminal, terrorist, or nation-state attacks as any government building can be targeted. Facilities supporting functions key to daily operations of Barnes County and the city of Valley City, such as the Barnes County Correctional Center, Barnes County Courthouse, Barnes County Law Enforcement Center, Barnes County Highway Department, City-County Health, Valley City City Hall and public works buildings, Valley City Police Department, CHI Mercy Health Valley City, Valley City State University, state and federal agencies located in Barnes County, public school districts, or buildings supporting emergency services such as fire and ambulance halls, would be the most vulnerable to a criminal, terrorist, or nation-state attack. **The level of vulnerability depends on the activities performed at a specific facility or level of security at the facility.**

A summary of city and publicly-owned buildings is provided in Chapter 3, Profile and Inventory.

### **Vulnerabilities of Critical Facilities and Infrastructure**

Like publicly-owned buildings and property, the vulnerability of critical facilities and infrastructure to criminal, terrorist, or nation-state attacks is imminent. CHI Mercy Health Valley City and infrastructure such as electric power, water/wastewater facilities, railroads, and pipelines are critical facilities and infrastructure vulnerable to the threat.

### **Vulnerabilities to New and Future Development**

Criminal, terrorist, or nation-state attacks are nearly impossible to predict and, therefore, vulnerabilities to new and future development cannot be determined. However, large influxes of people in a short period of time into sparsely populated areas can be a source of criminal, terrorist, or nation-state attack. In addition, new and future development that is located at or adjacent to politically or culturally sensitive areas, or constructed near environmentally sensitive areas, may cause controversy and be targeted by a criminal, terrorist, or nation-state attack.

Agriculture. The agricultural industry, with its increasing mechanization and industrialization, is not always located in urban areas, but are at risk to a criminal, terrorist, or nation-state attack.

Energy Development. The anticipated continuation of development of the oil and gas industry in the western portion of the state will result in transportation of energy products/materials, whether by pipeline, rail, or road through Barnes County, will also contribute to an increased risk of a criminal, terrorist, or nation-state attack due to past events and an increasing focus on political intervention and climate change.

Immigration. Illegal immigration to the United States by-way of Canada has increased and there is evidence of ISIS cells infiltrating and influencing people using this method of immigration. Due to the county's proximity to the Canadian border, this method of immigration may contribute to a criminal, terrorist, or nation-state attacks.

Population. The population density of North Dakota's major cities continues to increase as people leave rural areas in favor of urban lifestyles. This trend increases the vulnerability of cities to a criminal, terrorist, or nation-state attack as higher density living situations are the primary target for this threat.

### **Data Limitations**

The probability and vulnerabilities of a criminal, terrorist, or nation-state attack is hard to quantify given its isolated nature and the little recorded history of its impact to North Dakota, until recent large-scale events such as the Dakota Access Pipeline protest in the western portion of the state.

### **Other Key Documents**

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following documents.

- 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)
- Barnes County Local Emergency Operations Plan
- Barnes County Threat and Hazard Identification and Risk Assessment (THIRA)
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan, Terrorism Annex
- North Dakota State Disaster Recovery Plan
- North Dakota State Preparedness Report (SPR)
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

### 4.3 Cyberattack

An attack or hijack of information technology infrastructure critical to the functions controlled by computer networks such as: operating, financial, communications, and trade systems.

#### Characteristics

Any cyberattack that creates unrest, instability, or negatively impacts confidence of citizens/consumers can be considered cyber terrorism. According to N.D. Information Technology (NDIT), the seven common types are Advanced Persistent Threats, Distributed Denial of Service, Doxing, Malware, Media Threats, Password Phishing Attacks, and Socially Engineered Malware. The following information details the extent of cyberattack in Barnes County.

<b>Seasonal Pattern</b>	None. More frequent during Christmas/holidays, tax season, and after final testing at schools. Increased activity is experienced during other hazardous events such as a pandemic (COVID-19).
<b>Duration</b>	Varies based on the type of attack method used. Seconds/minutes/hours/days/weeks/months/potentially a year or more.
<b>Speed of Onset</b>	Little to no warning or up to several days/weeks.
<b>Location</b>	Total geographic extent of Barnes County – most likely targeting information databases at critical facilities and infrastructure such as the Barnes County Correctional Center, Barnes County Courthouse, Barnes County Law Enforcement Center, Barnes County Highway Department, City-County Health, Valley City City Hall and public works buildings, Valley City Police Department, CHI Mercy Health Valley City, Valley City State University, state and federal agencies located in Barnes County, public school districts, or chemical or oil and gas infrastructure, major employers, etc.

For more information regarding cyberattack please reference the **2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)**. The state plan can be accessed by following the electronic hyperlink or link to the N.D. Dept. of Emergency Services website:

[2018 North Dakota Enhanced Mitigation Mission Area Operations Plan](https://www.des.nd.gov/planning)

<https://www.des.nd.gov/planning>

#### History

Information on cyberattack was obtained from Barnes County Information Technology and the 2018 N.D. Enhanced Mitigation MAOP.

According to profile meeting participants and Barnes County Information Technology, the following cyber-related events occurred in Barnes County:

- 2020. A breach of Blackbaud, a private company, impacted the VCSU alumni system, along with Minot State and NDSU. Personal information of alumni may have been exposed.
- According to Valley City Public Schools, email accounts of staff have been comprised in the past.

- According to Valley City State University, email accounts have been compromised that send out SPAM or phishing accounts.

### 2018 N.D. Enhanced Mitigation MAOP

According to the 2018 N.D. Enhanced Mitigation MAOP, the following Cyberattack events occurred either in Barnes County or the state.

- In December 2017, several North Dakota Counties experienced a Cryptominer Virus that was eating CPU. The virus infected 81 computers. The spread of the virus was stopped at the firewall level and the antivirus vendor performed cleanup and extended monitoring. NDIT assisted with eradication and remediation of the virus. The incident lasted for approximately one day.
- **Dakota Access Pipeline (DAPL).** During the protest, personal information of law enforcement officers across the state who assisted in response to the protest was released with the intent to harass and/or intimidate them and their families. Doxing was the type of cyberattack used. There was also a significant increase in network traffic with intent to access state systems. This increased traffic required the state to increase its capacity with a larger firewall.

### United States

- On May 7, 2021, Colonial Pipeline (an American oil pipeline company) was the target of a ransomware cyberattack that impacted computerized equipment responsible for managing the pipeline. The company shut down the pipeline to contain the attack. The company was ordered to pay a requested ransom of \$4.4 million to regain control of its pipeline and did so within hours of the attack. DarkSide was the criminal hacking group responsible for the attack.

The Federal Motor Carrier Safety Administration issued a regional emergency declaration for 17 states and Washington D.C. to keep fuel supply lines open on May 9, 2021. It was the largest cyberattack on oil infrastructure in United States History.

According to EMSISoft, a New Zealand-based blog focusing on malware protection, the following information on ransomware attacks occurred in the United States:

- In 2019, the U.S. was hit by an unprecedented and unrelenting barrage of ransomware attacks that impacted at least 966 government agencies, educational establishments and healthcare providers at a potential cost more than \$7.5 billion. The impacted organizations included 113 state and municipal governments and agencies, 764 healthcare providers, and 89 universities, colleges and school districts, with operations at up to 1,233 individual schools potentially affected.

The incidents were not simply expensive inconveniences; the disruption they caused put people's health, safety and lives at risk.

- Emergency patients had to be redirected to other hospitals
- Medical records were inaccessible and, in some cases, permanently lost
- Surgical procedures were canceled, tests were postponed and admissions halted

- services were interrupted
- Dispatch centers had to rely on printed maps and paper logs to keep track of emergency responders in the field
- Police were locked out of background check systems and unable to access details about criminal histories or active warrants
- Surveillance systems went offline
- Badge scanners and building access systems ceased to work
- Jail doors could not be remotely opened
- Schools could not access data about students' medications or allergies

Other effects of the incidents included:

- Property transactions were halted
- Utility bills could not be issued
- Grants to nonprofits were delayed by months
- Websites went offline
- Online payment portals were inaccessible
- Email and phone systems ceased to work
- Driver's licenses could not be issued or renewed
- Payments to vendors were delayed
- Schools closed
- Students' grades were lost
- Tax payment deadlines had to be extended

**There have been no declared disasters or emergencies pertaining to cyberattack in Barnes County.**

### **Probability**

The probability of a hazard or threat is how likely it is it will happen. Cyberattacks are hard to predict but most probable at all levels of government (federal, local, and state), private businesses employing large numbers of people, and organizations/institutions. According to the 2018 N.D. Enhanced Mitigation MAOP, due to widespread and growing use of technology and the prevalence of ever-changing cyberattack methods, the probability of cyberattacks are very high. Profile meeting participants ranked the probability of cyberattack as highly likely meaning that there is a 100 percent probability in the next year of an attack, which does not always result in an incident.

### **Extent/Magnitude**

The extent/magnitude of a hazard or threat is expressed in the amount and/or number of damages or losses either actualized in a community or estimated based on known assets and levels of risk. The magnitude of a cyberattack can vary from a loss of personal information such as an individual's pictures and music to high magnitude events such as one that affects the national or agricultural economy, or information systems of critical facilities and infrastructure. According to the 2018 N.D. Enhanced Mitigation MAOP, loss estimates for cyberattack incidents in North Dakota are not available. However, the following national cyberattacks provide insight into the potential impacts of the threat.



- The 2017 WannaCry ransomware attack caused \$4 billion in financial losses.
- The 2017 NotPetya attack caused an estimated \$300 million in economic losses for FedEx subsidiary TNT Express and another \$300 million in losses for shipping. The attack originated in Ukraine.
- Lloyd’s of London, an insurance underwriter, developed a scenario for an attack on the Eastern Interconnection, which is one of two major electrical grids in the United States serving half the country. The economic loss of an attack was estimated at \$243 billion. The 2003 Northwest Blackout resulted in economic losses of between \$4 billion and \$10 billion.

**Risk Assessment**

Table 4.3.1 shows the risk assessment as determined by individual jurisdictions, the Steering Committee, and participants at the profile meeting for cyberattack. The risk assessment methodology can be found in the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA). The total in Table 4.3.1 represents the sum of each jurisdiction’s impact, frequency, likelihood, and vulnerability to a hazard/threat less the jurisdiction’s capabilities to respond to the hazard/threat.

**Table 4.3.1 – Barnes County Cyberattack Risk Assessment Scored Chart Summary**

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	4	2	4	2	3	9
City of Dazey	2	2	1	1	1	5
City of Fingal	2	2	1	2	1	6
City of Kathryn	2	2	1	1	1	5
City of Leal	1	2	1	1	1	4
City of Litchville	3	2	2	2	1	8
City of Nome	2	2	1	1	1	5
City of Oriska	2	2	1	1	1	5
City of Pillsbury	1	2	1	1	1	4
City of Rogers	2	2	1	1	1	5
City of Sanborn	2	2	1	2	1	6
City of Sibley	2	2	1	1	1	5
City of Valley City	4	3	4	2	3	10
City of Wimbledon	3	2	2	2	1	8

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 4.3.2 provides information on the specific impact, frequency, likelihood, vulnerability, and capability of cyberattack in Barnes County. A list of impacts identified as commonplace for natural hazards and man-made threats regardless of the jurisdiction is shown at the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA).

Table 4.3.2 – Barnes County Cyberattack Risk Assessment

<p><b>Impact</b></p>	<ul style="list-style-type: none"> <li>• Delayed Emergency Response</li> <li>• HAZMAT Release</li> <li>• Increased Public Safety Runs</li> <li>• Government Interruptions</li> <li>• Loss of Communication Systems – Loss of 9-1-1</li> <li>• Loss of Economy</li> <li>• Loss of Potable Water</li> <li>• Loss of Power</li> <li>• Mass Casualties/Fatalities</li> <li>• Loss/Overcrowded Medical Facilities</li> </ul> <ul style="list-style-type: none"> <li>• <b>Increased and unforeseen public and private costs due to response and recovery requirements</b></li> <li>• <b>Loss of websites and information for critical facilities</b></li> <li>• <b>Shutting down of infrastructure systems resulting in loss of economy activity as technological systems are used in nearly all industries, both public and private</b></li> <li>• <b>Targeting of emergency services personnel</b></li> <li>• <b>Loss of public confidence in county government</b></li> <li>• <b>Changing of information to misinformation on public websites to mislead/misdirect the public</b></li> </ul>		
<p><b>Frequency</b></p>	<ul style="list-style-type: none"> <li>• Significant increase in network traffic with intent to access state systems This increased traffic required the state to increase its capacity with a larger firewall.</li> <li>• <b>NDIT indicated an average of 5.7 million cyberattack attempts every month on the state level, but all do not result in an event/incident</b></li> </ul>		
<p><b>Likelihood</b></p>	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More likely</u></p> <ul style="list-style-type: none"> <li>• Digital economy with nation-wide banks and other institutions electronically linked to the state and county</li> <li>• Growing automation of daily tasks</li> <li>• Social media</li> <li>• Technological systems used in nearly all industries</li> <li>• <b>Presence of Baldhill Dam and Valley City State University utilizing computer systems</b></li> <li>• <b>Employees (both private and public) connecting personal thumb drives and smart phones into work computers and other digital/technological devices</b></li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less likely</u></p> <ul style="list-style-type: none"> <li>• State installed more sophisticated/capable firewall after DAPL protest – has a direct impact on county functions</li> <li>• Increased investment in security measures in private and public sectors (i.e., firewalls)</li> <li>• Ongoing investment in preventative education and enhanced countermeasures</li> <li>• NDIT and NDSLIC</li> <li>• Redundancies in state and county technology and power systems</li> <li>• Barnes County has a web filter and relies on the state firewall</li> <li>• Barnes County has software firewalls for CJIS – required by the federal government</li> <li>• Valley City State University has a firewall that blocks access to cyber systems, deployed two-factor authentication, two firewalls, cortex XDR antivirus in combination with a firewall</li> </ul> </td> </tr> </table>	<p><u>More likely</u></p> <ul style="list-style-type: none"> <li>• Digital economy with nation-wide banks and other institutions electronically linked to the state and county</li> <li>• Growing automation of daily tasks</li> <li>• Social media</li> <li>• Technological systems used in nearly all industries</li> <li>• <b>Presence of Baldhill Dam and Valley City State University utilizing computer systems</b></li> <li>• <b>Employees (both private and public) connecting personal thumb drives and smart phones into work computers and other digital/technological devices</b></li> </ul>	<p><u>Less likely</u></p> <ul style="list-style-type: none"> <li>• State installed more sophisticated/capable firewall after DAPL protest – has a direct impact on county functions</li> <li>• Increased investment in security measures in private and public sectors (i.e., firewalls)</li> <li>• Ongoing investment in preventative education and enhanced countermeasures</li> <li>• NDIT and NDSLIC</li> <li>• Redundancies in state and county technology and power systems</li> <li>• Barnes County has a web filter and relies on the state firewall</li> <li>• Barnes County has software firewalls for CJIS – required by the federal government</li> <li>• Valley City State University has a firewall that blocks access to cyber systems, deployed two-factor authentication, two firewalls, cortex XDR antivirus in combination with a firewall</li> </ul>
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Table 4.3.2 – Barnes County Cyberattack Risk Assessment - Continued

<b>Vulnerability</b>	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> <li>• <b>All state and local governments, businesses, and organizations/institutions that use digital/technological systems</b></li> <li>• Growing automation of daily tasks in individual’s lives, and private and public sectors</li> <li>• Social media</li> <li>• Technological systems used in nearly all industries</li> <li>• <b>Presence of Baldhill Dam and Valley City State University utilizing computer systems</b></li> <li>• <b>Employees (both private and public) connecting personal thumb drives and smart phones into work computers and other digital/technological devices</b></li> <li>• <b>VCSU does not store critical and personal information in their systems – this is done at the university system level</b></li> <li>• <b>Prolonged response time from NDIT for any general help desk/IT support</b></li> <li>• <b>Reliant on N.D. legislature for funding for support personnel and equipment</b></li> </ul>	<p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> <li>• NDIT has a Cyberattack Incident Response Plan that covers Barnes County systems</li> <li>• State installed more sophisticated/capable firewall after DAPL protest – has a direct impact on county functions</li> <li>• Ongoing investment in preventative education and enhanced countermeasures</li> <li>• NDIT and NDSLIC</li> <li>• <b>During the 66<sup>th</sup> Legislative Assembly of ND, Senate Bill 2110 to amend and reenact sections 54-50-01 and 54-59-05 of the N.D. Century Code. NDIT setting strategies and advising all branches of government for cyberattack and counter measures</b></li> <li>• Redundancies in state and county technology and power systems</li> <li>• The Barnes County Network has segmentation methods to keep wifi networks logically separated</li> <li>• High regulation of banking and other industries to mitigate cyberattacks</li> <li>• K20W Initiative – training school-aged kids on cyber education</li> <li>• VCSU has DUO – two-factor authentication</li> <li>• NDIT, with the help of a private contractor, conducted a cybersecurity audit of Barnes County and VCSU and issued a report shared with the N.D. legislature</li> <li>• Barnes County has a web filter and relies on the state firewall</li> <li>• Barnes County has software firewalls for CJIS – required by the federal government</li> <li>• Valley City State University has a firewall that blocks access to cyber systems, deployed two-factor authentication, two firewalls, cortex XDR antivirus in combination with a firewall</li> </ul>
<b>Capability</b>	<ul style="list-style-type: none"> <li>• See Chapter 7 for a list of capabilities to address cyberattack</li> <li>• Barnes County Cyberattack Response Plan</li> <li>• Valley City Public Schools Cyberattack Response Plan</li> <li>• Valley City State University Cyberattack Response Plan</li> </ul>	

### **Vulnerabilities to Publicly-Owned Buildings and Property**

Publicly-owned buildings and property are vulnerable to cyberattack as all state and local governments, businesses, and organizations/institutions use digital/technological systems. As day-to-day and extended operations become more reliant on digital infrastructure to operate, the vulnerability to publicly-owned building and property will increase. Facilities supporting functions key to daily operations of Barnes County and the city of Valley City, such as the Barnes County Correctional Center, Barnes County Courthouse, Barnes County Law Enforcement Center, Barnes County Highway Department, City-County Health, Valley City City Hall and public works buildings, Valley City Police Department, CHI Mercy Health Valley City, Valley City State University, state and federal agencies located in Barnes County, and public school districts would be the most vulnerable to a cyberattack.

An emerging vulnerability to publicly-owned buildings and property is the potential for cyberattacks to occur from personal devices of employees. Thumb drives, smart phones connected to work wirelessly, and other media storage used between home and work have the potential to be targeted by a cyberattack which could then spread to digital/technological systems at work. This vulnerability is also true for critical facilities and infrastructure.

A summary of publicly-owned buildings and property in Barnes County is provided in Chapter 3, Profile and Inventory.

### **Vulnerabilities of Critical Facilities and Infrastructure**

Like publicly-owned buildings and property, the vulnerability of critical facilities and infrastructure to cyberattacks is imminent as all state and local governments, businesses, and organizations/institutions use digital/technological systems. Digital/technological systems used by emergency services and branches of government such as GIS mapping or financial software, and utilities such as electric and natural gas are types of critical facilities and infrastructure most at risk to a cyberattack. In addition, public works infrastructure for the city of Valley City such as drinking/potable water and wastewater treatment systems are also vulnerable to the threat due to the use of SCADA systems.

### **Vulnerabilities to New and Future Development**

Cyberattacks target digital information and technological systems and therefore should have little to no impact on new and future development. However, with the increasing use of internet-connected technological systems in American households and the world economy, the understanding of the vulnerability to new and future development is evolving/expanding.

### **Data Limitations**

The probability and vulnerability of a cyberattack are hard to quantify given the multitude of plausible scenarios for an event. The threat has had little recorded history in North Dakota, until DAPL.

### **Other Key Documents**

This plan incorporates data from the following documents. Information from this plan will be incorporated in the update of said documents.

- 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)
- Barnes County Cyberattack Response Plan
- Barnes County Local Emergency Operations Plan
- Barnes County Threat and Hazard Identification and Risk Assessment (THIRA)
- North Dakota Continuity of Operations Plan
- North Dakota Cybersecurity Framework (NDCSF)
- North Dakota Emergency Operations Plan, Cyberattack Annex
- NDIT Security Incident Response Plan
- North Dakota State Disaster Recovery Plan
- North Dakota State Preparedness Report (SPR)
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)
- North Dakota University System Cyberattack Response Plan
- Valley City Public Schools Cyberattack Response Plan
- Valley City State University Cyberattack Response Plan

## 4.4 Dam Failure

### Characteristics

A dam is any artificial man-made barrier that impounds or diverts water or underground streams. A dam failure is defined as a sudden, rapid, and uncontrolled release of impounded water that will create a potential significant downstream hazard.

<b>Seasonal Pattern</b>	None
<b>Duration</b>	Minutes/Hours/Days/Weeks – dependent on respective inundation area
<b>Speed of Onset</b>	Minutes to Hours
<b>Location</b>	Inundation Area specific to each dam and the corresponding geography of the local area and critical facilities and infrastructure  <u>Baldhill Dam.</u> Inundation area includes six farmsteads, a U.S. Fish and Wildlife Service fish hatchery, and the city of Valley City.

Although it is recognized that loss of life is possible with any dam failure, the following categories of dams have been established:

**Low Hazard** – Dams located in rural or agricultural areas where there is little possibility of future development. Failure of low hazard dams may result in damage to agricultural land, township and county roads, and farm buildings other than residences. No loss of life is expected if the dam fails.

**Medium (Significant) Hazard** – Dams located in predominantly rural or agricultural areas where failure may damage isolated homes, main highways, railroads, or cause interruption of minor public utilities. The potential for a few lives lost may be expected if the dam fails.

**High Hazard** – Dams located upstream of developed and urban areas where failure may cause severe damage to homes, industrial and commercial buildings, and major public utilities. There is a potential for the loss of more than a few lives if the dam fails.

**All federal dams in North Dakota are required to have an emergency action plan. In addition, per the N.D. Century Code 61-03-25, emergency action plans are required for the nonfederal dams classified as medium/significant-or high-hazard dams in North Dakota.**

For more information regarding dam failure please reference the **2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)**. The state plan can be accessed by following the electronic hyperlink or link to the N.D. Dept. of Emergency Services website:

[2018 North Dakota Enhanced Mitigation Mission Area Operations Plan](#)

<https://www.des.nd.gov/planning>

### History

According to the National Performance of Dams Program-Stanford University, Barnes County Emergency Management, and U.S. Army Corps of Engineers (USACE), the following history of dam failure has occurred in Barnes County, North Dakota.

### Clausen Springs Dam

- In April 2009, the Clausen Springs Dam experienced a significant amount of flow through the emergency spillway due to spring runoff. Heavy snowmelt from more than 100 square miles of farmland draining into Spring Creek caused the dam to become overloaded with water. The rushing floodwaters poured over the dam into its earthen emergency spillway at a pressure so great it eroded the spillway several feet up its walls causing severe damage. Residents of the city of Kathryn were evacuated for several days. The N.D. National Guard dropped 1,000-pound sandbags from a helicopter on the spillway to shore it up. The dam was impacted by significant erosion but did not fail. Repairs to the Clausen Springs Dam were completed in October 2011.

### Tomahawk Dam

- In 2009, the Tomahawk Dam, which is owned by the U.S. Fish and Wildlife was inundated by excess snowmelt resulting in water topping over the dam. Minor damage was caused to the dam, but structural integrity was not compromised. Repairs commenced in 2009 and were completed in 2010.

**There has been one emergency regarding dam failure in Barnes County with Clausen Springs Dam in 2009. No disaster declarations have occurred pertaining to dam failure in Barnes County.**

### **List of Dams – Barnes County**

- Table 4.4.1 lists the high hazards dams and its respective inundation area(s) in Barnes County. The inundation area(s) are based on the Probable Maximum Flood (PMF) elevation, which would be a catastrophic dam failure event involving water spilling over the crest of each respective dam. According to the State Water Commission there are approximately 64 dams in Barnes County. Detailed information on dams in Barnes County can be found on a disc located at the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment.
- Due to homeland security purposes, limited information is shown regarding high hazard dams in Barnes County. Per the 2018 N.D. Enhanced Mitigation MAOP, there are two high-hazard dams (Baldhill Dam and Clausen Springs Dam) and two significant-hazard dams (Dazey Dam and Valley City Mill Dam) physically located in Barnes County.

Additional information can be accessed by contacting the State Water Commission, Barnes County Emergency Management, or USACE.

### **Probability**

The probability of a hazard or threat is how likely it is it will happen. Based on dam failure history for Barnes County and the risk assessment conducted at the dam failure profile meeting, the probability of dam failure is unlikely. The 2018 N.D. Enhanced Mitigation MAOP lists Barnes County as having moderate-high vulnerability to dam failure.

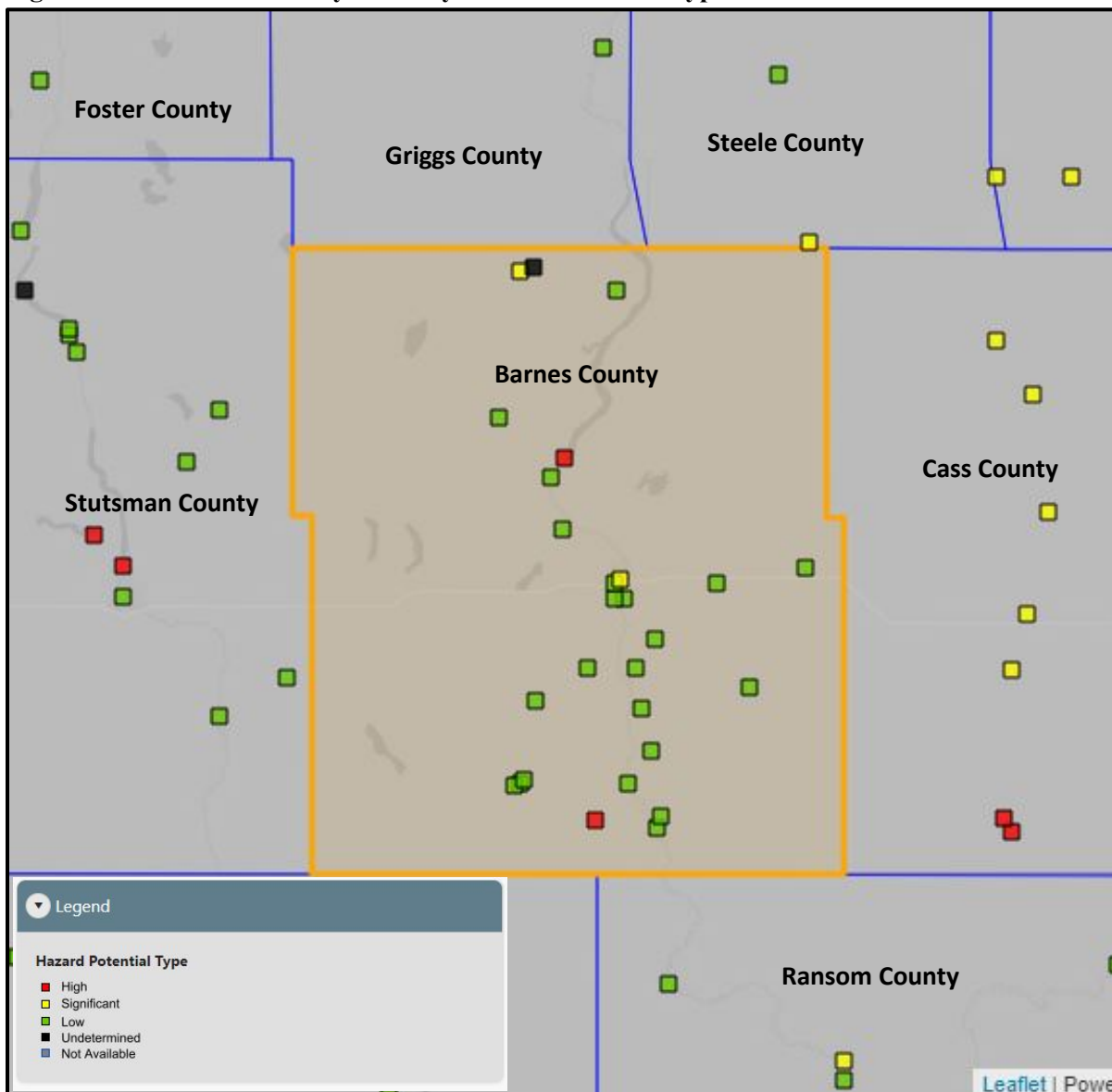
- **Baldhill Dam.** Failure of the Baldhill Dam would directly primarily impact the city of Valley City. The magnitude would be minimal in terms of loss of life as warning times would allow for

proper evacuation of people in the inundation area. However, property loss would be catastrophic as nearly the entire city of Valley City lies within the inundation area.

- Clausen Springs Dam.** According to the USACE, a spillway improvement project at the Clausen Springs Dam was completed in October 2011. The existing dam did not meet Class V dam design standards of the North Dakota Dam Design Handbook. Plans were developed and executed to repair the eroded emergency spillway and make the dam compliant with current safety standards. The spillway is fully armored and capable of handling any potential flows.

Figure 4.4.1 illustrates the location of dams by hazard potential in Barnes County. The information was provided by the USACE, National Inventory of Dams, which highlights 27 dams in Barnes County. The average age of the dams shown is 71 years and none provide hydropower.

**Figure 4.4.1 – Barnes County Dams by Hazard Potential Type**



Source(s): USACE, National Inventory of Dams



Table 4.4.1 – Barnes County Significant and High Hazard Dams

Dam	Authorized Purpose	Classification	Location	Area(s) of Inundation
Baldhill Dam	Environmental Stewardship, Flood Control, Recreation, Water Supply (primary)	High Hazard	North-central Barnes County approximately 13.8 river miles north of the city of Valley City	<ul style="list-style-type: none"> <li>City of Valley City – 2,600 housing units, commercial and industrial property, and critical facilities and infrastructure (Barnes County Courthouse, CHI Mercy Hospital, Valley City City Hall, , BNSF Railroad, CP Railway, Interstate 94)</li> <li>U.S. Fish and Wildlife Service fish hatchery</li> <li>Estimated six to 12 farmsteads</li> </ul>
Clausen Springs Dam	Recreation	High Hazard	South-central Barnes County approximately three miles west of the city of Kathryn	<ul style="list-style-type: none"> <li>City of Kathryn (approximately 50 people)</li> <li>Four farmsteads</li> </ul>
Dazey Dam	Recreation	Significant Hazard	Approximately three miles northeast of the city of Dazey	<ul style="list-style-type: none"> <li>Rural farmland and farmsteads</li> <li>Wesley Acres Bible Camp</li> <li>N.D. Highway 26</li> </ul>
Valley City Mill Dam	Water Supply	Significant Hazard	City of Valley City near Valley City State University	<ul style="list-style-type: none"> <li>3<sup>rd</sup> Ave Bridge</li> <li>Portions of Valley City State University</li> </ul>

Source(s): State Water Commission; National Inventory of Dams (USACE)

### Extent/Magnitude

The extent/magnitude of a hazard or threat is expressed in the amount and/or number of damages or losses either actualized in a community or estimated based on known assets and levels of risk. The magnitude of dam failure in Barnes County can be determined by the area or areas of inundation for each respective dam as shown in Table 4.4.1. Profile meeting participants discussed the extent/magnitude of a failure of the Baldhill Dam and Clausen Springs Dam in Barnes County and provided the following information.

- **Baldhill Dam.** Failure of the Baldhill Dam would directly impact the city of Valley City, which comprises approximately 60 percent of the Barnes County population and contains nearly all critical facilities and infrastructure. If an incident did occur, property loss would be catastrophic as an estimated 2,600 housing units in the urbanized core of the city of Valley City are in the inundation area, in addition to critical facilities, commercial and industrial properties, civic spaces, etc. In rural areas of Barnes County, farmsteads, cropland, and commercial/industrial enterprises would be impacted. The magnitude would be minimal in terms of loss of life as warning times would allow for proper evacuation of people in the inundation area.
- **Clausen Springs Dam.** Failure of the Clausen Springs Dam would directly impact the city of Kathryn. With a 2019 estimated population of 48 people, the impact would not be catastrophic to Barnes County overall, but catastrophic to the city. In rural areas of southern Barnes County, farmsteads, cropland, and commercial/industrial enterprises would be impacted.

### Vulnerabilities of Publicly-Owned Buildings and Property

The Baldhill Dam and Clausen Springs Dam are classified as high hazard dams. The Baldhill Dam has the potential to impact a majority of publicly-owned buildings and property in Barnes County in the city of Valley City.

A summary of publicly-owned buildings and property in Barnes County is provided in Chapter 3, Profile and Inventory.

### Vulnerabilities of Critical Facilities and Infrastructure

Critical facilities and infrastructure are vulnerable to dam failures like publicly-owned buildings and property and are highly susceptible to impacts from flood waters resulting from dam failures. Infrastructure such as rail and roads in the transportation network, communication infrastructure, drinking/potable water and wastewater systems, and power lines in the utility network are vulnerable and have the potential to experience complete destruction. Major transportation routes such as Interstate 94, major freight railroad lines, the Hi-Line Bridge, and numerous county roads are vulnerable to dam failure.

Chapter 3, Profile and Inventory provides information on publicly-owned buildings and property in Barnes County and Chapter 9, Maps provides maps of the transportation network in Barnes County.

Although not officially identified as critical facilities and infrastructure, bridges crossing the Sheyenne River in the city of Valley City would be destroyed if a dam failure were to occur. This type of occurrence would eliminate access to the inundation area to respond to such an event. Interstate 94 also

traverses the Sheyenne River at Valley City. This bridge would be impacted if an event occurred, which would eliminate access to the city on a regional level and disrupting state-level commerce.

A list of the bridges that would be impacted by a dam failure, with a general description, is shown below.

### **Barnes County Bridges**

- 4<sup>th</sup> Bridge south of Valley City
- 5<sup>th</sup> Bridge south of Valley City
- 1<sup>st</sup> Bridge south of Valley City
- 2<sup>nd</sup> Bridge south of Valley City
- 3<sup>rd</sup> Bridge south of Valley City
- Maryvale
- North Valley Bridge

### **Valley City Bridges**

- 200 Blk – 11<sup>th</sup> Ave SE
- 5th Ave SE
- Viking Drive
- City Park Entrance Drive
- East City Park – 4<sup>th</sup> St. SW
- Rainbow – East Main St.
- Hospital – 6<sup>th</sup> St NE
- West City Park – 4<sup>th</sup> St. SW
- 3<sup>rd</sup> Ave SE – West of Mill Dam
- Interstate 94

### **Vulnerabilities to New and Future Development**

New and future development geographically located in dam inundation areas are most at risk to dam failure. Vulnerabilities of new and future development in the city of Valley City has the potential to be reduced or eliminated if prohibited in the Sheyenne River valley and permitted on surrounding hillsides. However, the city of Valley City is almost entirely located in the inundation area. The city of Valley City and Barnes County does not have any known laws to prohibit or mitigate new development in dam inundation areas apart from prohibiting development in areas located in designated floodplains. Although flood waters resulting from dam failures tend to flow along the floodplain, they can often extend beyond the floodplain due to the size and volume involved. Therefore, development located outside of the floodplain can still be at risk to a dam failure.

The city of Sibley is located geographically on Lake Ashtabula, which is formed by Baldhill Dam. New and future development would not be at risk to destruction from a dam failure. However, the city's economy is heavily dependent on the recreation activity provided by Lake Ashtabula. A dam failure would ultimately lead to emptying of the lake and devastate the local economy.

## Risk Assessment

Table 4.4.2 shows the risk assessment as determined by individual jurisdictions, the Steering Committee, and meeting participants at the profile meeting for dam failure. The risk assessment methodology can be found in the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA). The total in Table 4.4.2 represents the sum of each jurisdiction's impact, frequency, likelihood, and vulnerability to a hazard/threat less the jurisdiction's capabilities to respond to the hazard/threat.

**Table 4.4.2 – Barnes County Dam Failure Risk Assessment Scored Chart Summary**

<b>Jurisdiction</b>	<b>Impact</b>	<b>Frequency</b>	<b>Likelihood</b>	<b>Vulnerability</b>	<b>Capabilities</b>	<b>Total</b>
Barnes County	4	2	2	4	3	<b>9</b>
City of Dazey	NA	NA	NA	NA	NA	<b>NA</b>
City of Fingal	NA	NA	NA	NA	NA	<b>NA</b>
City of Kathryn	4	3	3	3	1	<b>12</b>
City of Leal	NA	NA	NA	NA	NA	<b>NA</b>
City of Litchville	NA	NA	NA	NA	NA	<b>NA</b>
City of Nome	NA	NA	NA	NA	NA	<b>NA</b>
City of Oriska	NA	NA	NA	NA	NA	<b>NA</b>
City of Pillsbury	NA	NA	NA	NA	NA	<b>NA</b>
City of Rogers	NA	NA	NA	NA	NA	<b>NA</b>
City of Sanborn	NA	NA	NA	NA	NA	<b>NA</b>
City of Sibley	4	2	2	3	1	<b>10</b>
City of Valley City	4	1	1	4	2	<b>8</b>
City of Wimbledon	NA	NA	NA	NA	NA	<b>NA</b>

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 4.4.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of dam failure in Barnes County. A list of impacts identified as commonplace for natural hazards and man-made threats regardless of the jurisdiction is shown in Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA).

Table 4.4.3 – Barnes County Dam Failure Risk Assessment

<p><b>Impact</b></p>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Crop Loss and Loss of Livestock</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Loss of Critical Facilities and Infrastructure</li> <li>• Loss of Potable/Drinking Water</li> <li>• Loss of Power</li> <li>• Loss of Transportation Systems/Accessibility</li> <li>• Loss of Wildlife Habitat</li> <li>• <b>Mass Casualties/Fatalities</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Widespread destruction of the city of Valley City due to the city located downstream from the dam – 2,600 housing units, Barnes County Courthouse, CHI Mercy Hospital Valley City, Valley City City Hall</b></li> <li>• Loss of recreational activities and summer-time population resulting in economic loss</li> <li>• Possible temporary homeless population due to lack of facilities to shelter large numbers of people</li> <li>• Statewide interruption of transportation mobility due to impact to Interstate 94 and BNSF and CP Railway infrastructure</li> </ul>
<p><b>Frequency</b></p>	<ul style="list-style-type: none"> <li>• In April 2009, the Clausen Springs Dam experienced a significant amount of flow through the emergency spillway due to spring runoff. Heavy snowmelt from more than 100 square miles of farmland draining into Spring Creek caused the dam to become overloaded with water. The city of Kathryn was evacuated.</li> </ul>	<ul style="list-style-type: none"> <li>• In 2009 and 2011, the Interstate 94 bridge in Valley City was nearly impacted/submerged by floodwater.</li> <li>• In 2009, the Tomahawk Dam, which is owned by the U.S. Fish and Wildlife, was inundated by excess snowmelt resulting in water topping over the dam. Minor damage was occurred but structural integrity was not compromised.</li> </ul>
<p><b>Likelihood</b></p>	<p><u>More likely</u></p> <ul style="list-style-type: none"> <li>• Heavy rains and/or melting of snowpack may lead to dams becoming overwhelmed</li> <li>• Aging infrastructure – at 50 years the likelihood/probability of a dam failure increases</li> <li>• <b>Climate change will affect the likelihood of dam failures due to significant changes and fluctuations in precipitation frequency and volume</b></li> </ul>	<p><u>Less likely</u></p> <ul style="list-style-type: none"> <li>• Dry periods of weather with little to no rain or lack of heavy snow fall</li> <li>• USACE conducts ongoing and continuous maintenance and replacement programs of the Baldhill Dam and related infrastructure</li> </ul>
<p><b>Vulnerability</b></p>	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> <li>• Critical facilities and infrastructure in the city of Valley City</li> <li>• Nearly all of Barnes County emergency response and government facilities are in the inundation area</li> <li>• Continuous development in Valley City within the floodplain and Sheyenne River Valley - lack of alternative housing or shelters for displaced residents</li> <li>• CHI Mercy Hospital Valley City located in inundation area</li> </ul>	<p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> <li>• Annual and ongoing dam inspections &amp; routine maintenance</li> <li>• Permanent trained subject matter experts providing continuous monitoring and maintenance of dams</li> <li>• Baldhill Dam does not have power generation capabilities – less likely a target to homeland security threats</li> <li>• USACE completed its 50-year rehabilitation of Baldhill Dam in the 1990s</li> </ul>

Table 4.4.3 – Barnes County Area Dam Failure Risk Assessment -- Continued

<p><b>Vulnerability</b></p>	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> <li>• BNSF, CP Railway, and Interstate 94 – disruption in state and regional transportation mobility</li> <li>• Tier II sites and pipelines located in inundation areas</li> <li>• Baldhill Dam a possible terrorist target</li> <li>• Lack of alternative housing or shelters to house displaced residents</li> </ul> <p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> <li>• 8-hour water travel time warning time before floodwaters impacts Valley City</li> <li>• Baldhill Dam has an EAP</li> <li>• Baldhill Dam has an emergency spillway</li> <li>• Restricted area of 500 feet from the dam that deters people</li> <li>• Barnes County Everbridge</li> <li>• <b>Baldhill Dam Operations Meeting (annually in April) directed by USACE</b></li> <li>• <b>USACE regulates flood control releases on Baldhill Dam when inflows increase to elevated levels</b></li> </ul>
<p><b>Capability</b></p>	<p><u>Administrative and Technical</u></p> <ul style="list-style-type: none"> <li>• National Guard</li> <li>• USACE – Baldhill Dam Manager</li> <li>• Baldhill Dam Operations Meeting (annually in April) directed by the USACE</li> </ul> <p><u>Education and Outreach</u></p> <ul style="list-style-type: none"> <li>• Exercise of emergency action plan with USACE, fire, law enforcement, red cross, downstream emergency managers, county emergency manager, fish and wildlife for both dams on a recurring basis</li> </ul> <p><u>Financial</u></p> <ul style="list-style-type: none"> <li>• All agencies that participate on the local level provide their own funding</li> <li>• Department of Defense / USACE</li> <li>• FEMA</li> </ul> <p><u>Planning and Regulatory</u></p> <ul style="list-style-type: none"> <li>• Baldhill Emergency Action Plan (EAP)</li> <li>• Baldhill Dam Water Control Manual</li> <li>• Dam Safety and periodic inspections (USACE)</li> <li>• Standing Operating Procedure (SOP) – EAP is a part of this document</li> <li>• Valley City Emergency Flood Plan</li> </ul>

### Data Limitations

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following documents.

### Other Key Documents

An Emergency Action Plan (EAP) specifies actions dam owners should take to moderate or alleviate the problems at the dam. It contains procedures and information such as failure inundation maps to assist emergency management officials with early-warning notification and evacuation plans. As stated in the North Dakota Century Code, dams with a storage capacity greater than 1,000 acre-feet are required to have an EAP. An EAP is in place for the Baldhill Dam and Clausen Springs Dam.

- 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)
- Baldhill Dam Emergency Action Plan (EAP)
- Baldhill Dam Water Control Manual
- Barnes County Comprehensive Plan
- Barnes County Threat and Hazard Identification and Risk Assessment (THIRA)
- Barnes County Zoning Ordinances
- City-County Health District Evacuation and Shelter Plan
- City-County Health District Local Emergency Operations Plan
- City-County Health District Shelter and Mass Care Plan
- Clausen Springs Dam Emergency Action Plan (EAP)
- North Dakota Continuity of Operations Plan
- *North Dakota Dam Design Handbook (being updated)*
- North Dakota Emergency Operations Plan, Dam Failure Annex
- North Dakota State Disaster Recovery Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)
- Valley City Emergency Flood Plan
- Valley City Flood Ordinances
- Valley City Strategic Plan
- Valley City Zoning Ordinances

## 4.5 Drought

Including precipitation levels well below normal and heat – temperatures higher than normal.

### Characteristics

Drought is a deficiency in precipitation over an extended period, usually a season or more, resulting in a water shortage causing adverse impacts on vegetation, animals, and/or people. Drought is a temporary diversion from normal climatic conditions and is different than aridity, which is a permanent feature of climate in regions where low precipitation is the norm, as in a desert.

According to the National Drought Mitigation Center, the following types of droughts exist.

- **Meteorological drought** is usually an expression of precipitation’s departure from normal over some period. These definitions are usually region-specific, and presumably based on a thorough understanding of regional climatology.
- **Agricultural drought** occurs when there is not enough soil moisture to meet the needs of a crop at any given time. Agricultural drought happens after meteorological drought but before hydrological drought. Agriculture is usually the first economic sector to be affected by drought.
- **Hydrological drought** refers to deficiencies in surface and subsurface water supplies. It is measured as streamflow and as lake, reservoir, and groundwater levels. There is a time lag between lack of rain and less water in streams, rivers, lakes, and reservoirs, so hydrological measurements are not the earliest indicators of drought. When precipitation is reduced or deficient over an extended period, this shortage will be reflected in declining surface and subsurface water levels.
- **Socioeconomic drought** occurs when physical water shortage starts to affect people, individually and collectively. Or, in more abstract terms, most socioeconomic definitions of drought associate it with the supply and demand of an economic good.

<b>Seasonal Pattern</b>	Primarily summer, but can occur in spring, fall, and winter
<b>Duration</b>	Weeks/months, up to a decade in severe cases
<b>Speed of Onset</b>	Slow and gradual
<b>Location</b>	Total geographic extent of Barnes County

The U.S. is vulnerable to the social, economic, and environmental impacts of drought. The over 100-year weather record of the U.S. indicates that there were three to four major drought events. Two of these, the 1930s Dust Bowl drought and the 1950s drought, each lasted five to seven years and covered large areas of the continental United States.



For more information regarding drought please reference the **2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)**. The state plan can be accessed by following the electronic hyperlink or link to the N.D. Dept. of Emergency Services website:

[2018 North Dakota Enhanced Mitigation Mission Area Operations Plan](#)

<https://www.des.nd.gov/planning>

### **History**

According to the National Climatic Data Center (NCDC), no occurrences of drought were reported in Barnes County between January 1, 1950, and December 31, 2020.

Information gathered from profile meeting participant meetings indicated that while dryer periods have come and gone, the most recent drought of significance occurred in 1988/1989 and lasted until 1991/1992. Extreme drought conditions started in October of 2020, and spring and summer of 2021.

### 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)

The following bullet points summarize the history of drought in Barnes County per the 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP). A detailed hazard history for Barnes County can be found on a disc located at the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA).

- Since 1930, North Dakota has suffered drought in the 1930s, 1950s, early 1960s, mid 1970s, early 1980s, 1988 through 1991, 2002 through 2004, 2006, 2008, 2012/2013, and 2017.
- A state-wide drought was declared in 1980, 1981, 2002, 2005, and 2012 impacting all counties in North Dakota.
- **Typically, presidential declarations pertaining to drought occur before secretarial declarations by the USDA as secretarial declarations are not permitted without a presidential declaration. Since 1976, Barnes County has been included in 25 drought declared disasters or emergencies, of which 13 were state declared emergency orders, one was presidential, and 11 were USDA Secretarial Declarations.**

### U.S. Dept. of Agriculture, Risk Management Agency

Crop loss from drought is tracked by the U.S. Dept. of Agriculture, Risk Management Agency (RMA). The RMA provides data on the crop type affected, damage cause description, determined acres, and indemnity amount. The damage-cause description identifies the cause of damage and the number of acres lost due to damage, and the indemnity amount identifies the total amount of the loss for the designated peril. **Between January 1, 2001, and December 31, 2020, Barnes County experienced 186 incidents of crop loss due to drought impacting approximately 456,753.38 acres of crops totaling \$38,312,881.10 in losses.**

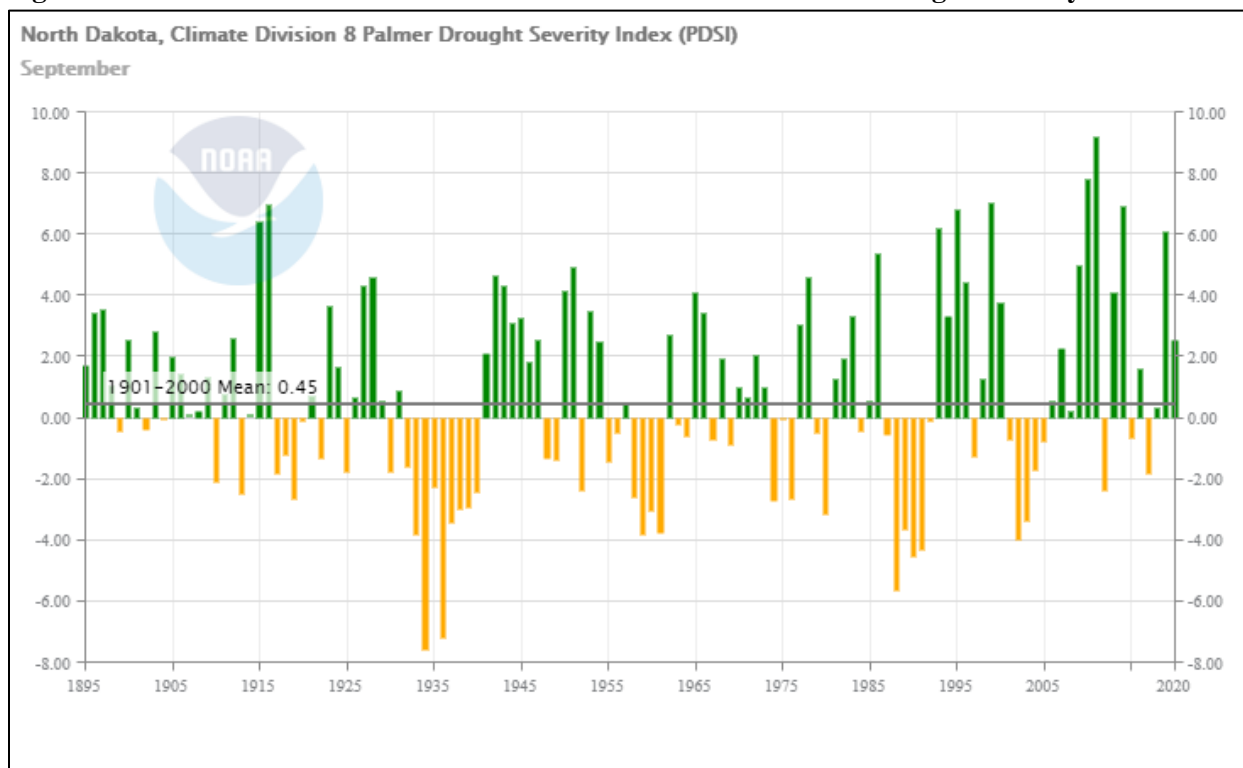
### Palmer Drought Severity Index (PDSI)

The Palmer Drought Severity Index (PDSI) is an estimated measurement of dryness based on temperature and precipitation based available. It is a standardized index that generally spans -10 (dry) to +10 (wet). Maps of operational agencies like NOAA typically show a range of -4 to +4, but more extreme values are possible.

The PDSI has been reasonably successful at quantifying long-term drought. As it uses temperature data and a physical water balance model, it can capture the basic effect of global warming on drought through changes in potential evapotranspiration. Monthly PDSI values do not capture droughts on time scales less than about 12 months; more pros and cons are discussed in the Expert Guidance.

- Figure 4.5.1 is the PDSI and was provided by the North Dakota State Climatologist at North Dakota State University.
- According to PDSI, between 1895 and 2020 North Dakota experienced multi-year droughts in the 1930s, 1950s, 1980s, and 2000s.

**Figure 4.5.1 – 1895 to 2020 North Dakota Climate Division 8 Palmer Drought Severity Index**



Source(s): Palmer Drought Severity Index (PDSI); North Dakota State University

### **Probability**

The probability of a hazard or threat is how likely it is it will happen. The probability of drought varies annually and is highly dependent on seasonal weather patterns. According to profile meeting participants, the probability of drought in Barnes County is likely meaning that there is a 50 percent probability in the

next year of a drought to a varying degree of severity. Drought is a naturally occurring phenomenon and, therefore, it is indisputable that a drought of significance will occur based on climatic patterns at some point in the future in Barnes County.

- **Based on 13 state declared emergency orders, one was presidential, and 11 were USDA Secretarial Declarations pertaining to drought between 1976 and 2017, the probability of drought is 61 percent in any given year.**
- With the local economy of small, incorporated cities in the county heavily reliant on the agriculture industry, the probability of drought can be measured by crop loss. According to crop loss data from the USDA-RMA, Barnes County experienced \$2,016,468.43 in annualized crop damage and 10 annual claims of indemnity between 2001 and 2020. **Therefore, based on data available, the probability of crop loss from drought is calculated to be 100 percent.**

### Extent/Magnitude

Profile meeting participants indicated the extent/magnitude or impact of drought in Barnes County as catastrophic meaning that more than 50 percent of the county, its people and property are affected if a drought of significance occurred. The following are key points from the state risk assessment in the 2018 N.D. Enhanced Mitigation MAOP.

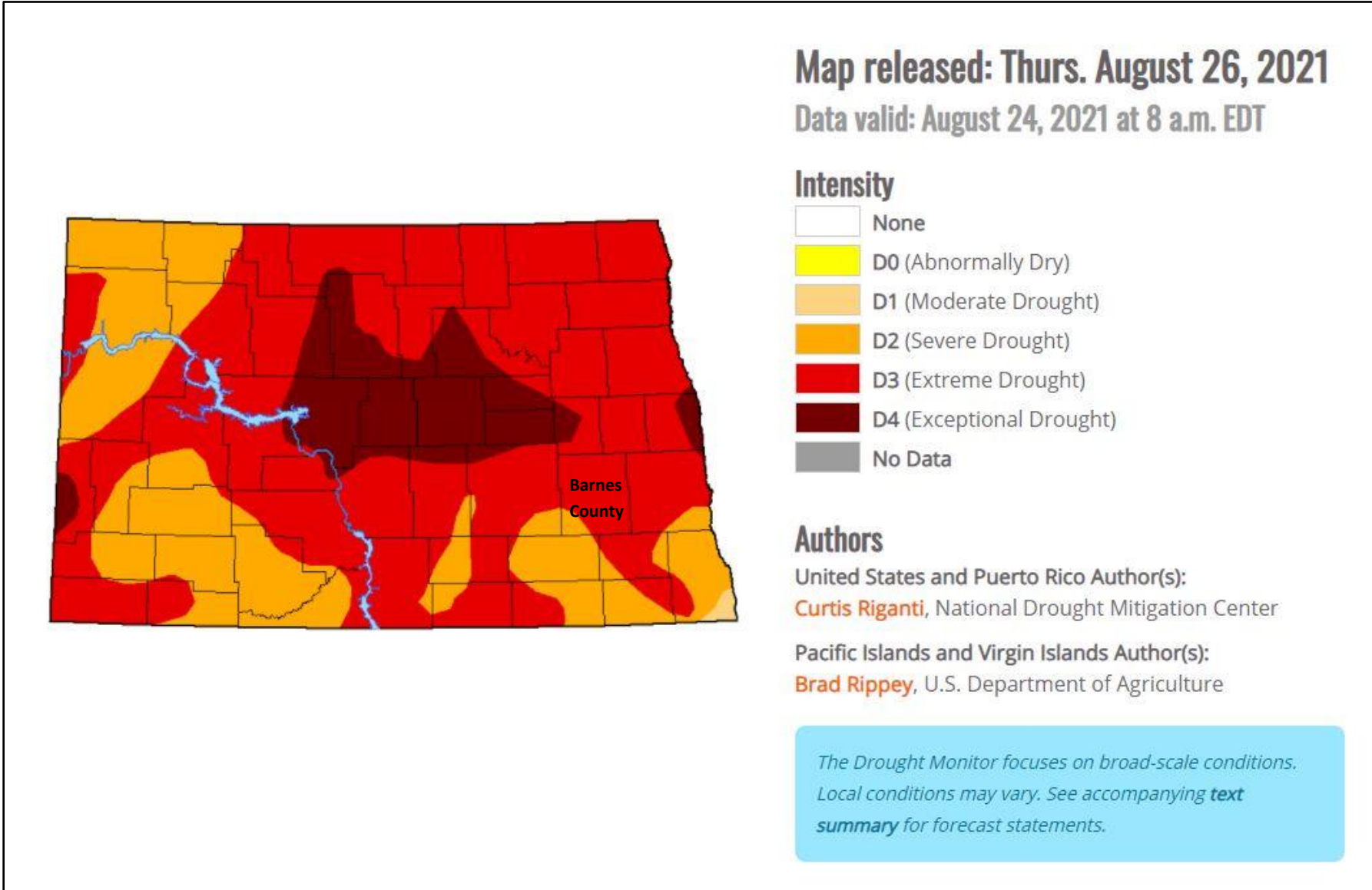
- Barnes County has a low-moderate overall vulnerability to drought based on \$38,894,617.00 in crop insurance paid between 2003 and 2017 due to impacts of drought resulting in annualized payments of \$2,592,974.47 in the same time frame.
- Annualized crop damage of \$2,913,454.00 between 2003 and 2017.

U.S. Drought Monitor (USDM). The USDM is a drought communication system managed by the National Drought Mitigation Center at the University of Nebraska-Lincoln updated every Thursday to show the location and intensity of drought across the United States. The USDM uses the following five-category system, labeled:

- Abnormally Dry or D0, (a precursor to drought, not actually drought);
- Moderate (D1);
- Severe (D2);
- Extreme (D3), and
- Exceptional (D4) Drought.

Drought categories show experts' assessments of conditions related to dryness and drought including observations of how much water is available in streams, lakes, and soils compared to usual amounts for the same time of year. U.S. Drought Monitor data go back to 2000. Figure 4.5.2 shows the status of drought conditions in North Dakota as of August 26, 2021. A substantial portion of Barnes County was classified as D3 or Extreme Drought while the southwest areas were classified as D2 (Severe Drought).

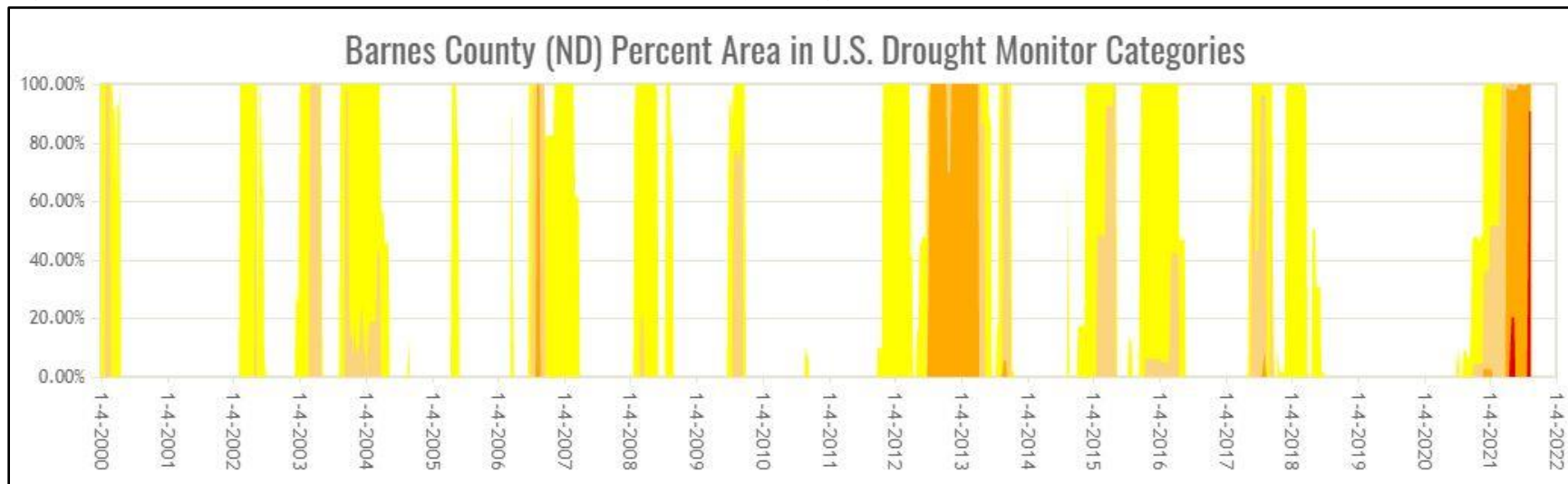
Figure 4.5.2 – August 26, 2021, U.S. Drought Monitor, North Dakota



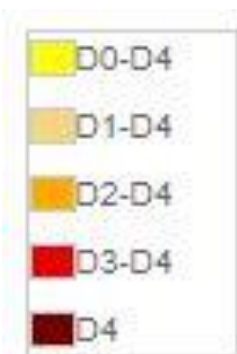
Source(s): U.S. Drought Monitor

Figure 4.5.3 shows the time series of drought for Barnes County from January 4, 2000, to January 4, 2022, and the percent of the county and its respective drought classification. The figure is shown to assist Barnes County in understanding the characteristics of local drought impacts. As seen in the figure, Barnes County has had abnormally dry conditions most years with brief periods of moderate drought mixed with small instances of severe and extreme drought in the summer of 2006, 2012/2013, in the summer/fall of 2017, and the summer of 2021.

**Figure 4.5.3 – January 4, 2000, to January 4, 2022, Barnes County Drought Time Series**



Source(s): U.S. Drought Monitor



## Risk Assessment

Table 4.5.1 shows the risk assessment as determined by individual jurisdictions, the Steering Committee, and meeting participants at the profile meeting for drought. The risk assessment methodology can be found in the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA). The total in Table 4.5.1 represents the sum of each jurisdiction's impact, frequency, likelihood, and vulnerability to a hazard/threat less the jurisdiction's capabilities to respond to the hazard/threat.

**Table 4.5.1 – Barnes County Drought Risk Assessment Scored Chart Summary**

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	4	2	3	4	3	<b>10</b>
City of Dazey	4	2	2	3	2	<b>9</b>
City of Fingal	4	3	3	3	1	<b>12</b>
City of Kathryn	3	3	3	3	2	<b>10</b>
City of Leal	2	2	1	1	3	<b>3</b>
City of Litchville	3	2	2	2	3	<b>6</b>
City of Nome	2	1	1	4	1	<b>7</b>
City of Oriska	4	2	3	2	2	<b>9</b>
City of Pillsbury	2	2	3	2	2	<b>7</b>
City of Rogers	4	2	2	3	1	<b>10</b>
City of Sanborn	4	1	2	2	1	<b>8</b>
City of Sibley	2	2	2	2	1	<b>7</b>
City of Valley City	1	2	2	2	3	<b>4</b>
City of Wimbledon	4	3	3	4	2	<b>12</b>

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

A list of impacts identified as commonplace for natural hazards and man-made threats regardless of the jurisdiction is shown in Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA).

Table 4.5.2 provides information on the specific impact, frequency, likelihood, vulnerability, and capability of drought in Barnes County.

**Table 4.5.2 – Barnes County Area Drought Risk Assessment**

<p><b>Impact</b></p>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Loss of Economy</li> <li>• Loss of Livestock</li> <li>• Loss of Wildlife Habitat</li> <li>• Increase in Wildland Fire Potential</li> <li>• Water quality compromised from lakes and stock dams</li> <li>• Diminished soil health</li> <li>• Negative impact on mental health of producers and fire responders – “community impact”</li> </ul>	<ul style="list-style-type: none"> <li>• Local producers forced to reduce herd sizes and restructuring of harvest usage</li> <li>• Population decline due to loss of jobs/economy</li> <li>• Annualized crop damage of \$2,913,454.00 between 2003 and 2017 (<b>2018 State Enhanced Mitigation MAOP</b>)</li> <li>• <b>Between January 1, 2001, and December 31, 2020, Barnes County experienced 186 incidents of crop loss due to drought impacting approximately 456,753.38 acres of crops totaling \$38,312,881.10 in losses.</b></li> </ul>
<p><b>Frequency</b></p>	<ul style="list-style-type: none"> <li>• Severe Drought of 1961/1962, 1988/1989 through 1991/1992, 2012/2013</li> <li>• Summer of 2017, local producers forced to sell off portions of their herds</li> <li>• End of July through winter of 2016 – county reached severe drought status</li> <li>• <b>Severe drought conditions starting October 2020 through the summer/fall 2021</b></li> <li>• <b>CRP was released from haying</b></li> </ul>	<ul style="list-style-type: none"> <li>• Barnes County experienced \$2,016,468.43 in annualized crop damage and 10 annual claims of indemnity between 2001 and 2020</li> <li>• <b>FSA activated the Livestock Forage Program in 2012 and 2021</b></li> <li>• <b>Based on 13 state declared emergency orders, one was presidential, and 11 were USDA Secretarial Declarations pertaining to drought between 1976 and 2017, the probability of drought is 61 percent in any given year.</b></li> </ul>
<p><b>Likelihood</b></p>	<p><u>More likely</u></p> <ul style="list-style-type: none"> <li>• Dry conditions</li> <li>• Climatic patterns will result in an eventual drought of significance</li> <li>• Lack of precipitation</li> <li>• Weather patterns becoming more irregular and extreme</li> </ul>	<p><u>Less likely</u></p> <ul style="list-style-type: none"> <li>• Heavy precipitation</li> <li>• Baldhill Dam controls amount of water and serves as a reservoir for drinking/potable water</li> </ul>

**Table 4.5.2 – Barnes County Area Drought Risk Assessment – Continued**

<b>Vulnerability</b>	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> <li>• Loss of economy from decreased wildlife &amp; hunting</li> <li>• Agriculture economy</li> <li>• Elderly population</li> <li>• Flat terrain/open topography contributes to conditions</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Lack of water sources for drought relief and for suppression of fires resulting from drought in some jurisdictions</li> <li>• <b>Presence of aquifers, which are used for livestock and municipal water sources</b></li> <li>• <b>Depletion of ground water sources during droughts of significance</b></li> <li>• <b>Portions of Barnes County has sandy soil types, which does not hold much water and contributes to drought conditions</b></li> <li>• <b>Natural streams providing water for livestock and municipal uses can dry up</b></li> <li>• <b>Social Media</b></li> <li>• <b>Increased risk to Anthrax</b></li> </ul>	<p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> <li>• Financial assistance programs made available by the state and federal government</li> <li>• Fire Index monitoring and mapping from NDDDES</li> <li>• Drought Monitor updating drought conditions on a weekly basis (every Thursday)</li> <li>• Advanced communications such as internet and TV</li> <li>• <b>Incorporated jurisdictions with water towers</b></li> <li>• <b>Regional water systems – Barnes Rural Water District</b></li> <li>• <b>No-till farming practices in use across the county</b></li> <li>• <b>Presence of CRP</b></li> <li>• <b>Presence of aquifers and streams for water supplies for livestock and municipal purposes</b></li> <li>• <b>N.D. Agriculture Weather Network</b></li> <li>• Some drain tile systems have control valves that allows for storage of water</li> <li>• <b>Portions of Barnes County has clay soil types, which holds water better than sandy soils</b></li> <li>• Social Media</li> <li>• NDSU Extension Statewide Drought Resource Page (online)</li> <li>• NDSU Extension Feed/Hay List</li> </ul>
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**Table 4.5.2 – Barnes County Area Drought Risk Assessment - Continued**

<b>Capability</b>	<p>See Chapter 7 for a list of capabilities to address drought.</p> <p><u>Administrative and Technical</u></p> <ul style="list-style-type: none"> <li>• Active county commission</li> <li>• Full-time emergency manager</li> <li>• NDSU Extension/Barnes County</li> <li>• Farm Service Agency (FSA)</li> <li>• Natural Resource Conservation Service (NRCS)</li> <li>• Contracts for engineering, planning and grant writing</li> <li>• GIS services provided through state</li> <li>• County-wide mutual aid agreement</li> <li>• USDA Emergency Board</li> <li>• Barnes County Soil Conservation District (BCSCD)</li> <li>• N.D. Agriculture Weather Network</li> </ul> <p><u>Education and Outreach</u></p> <ul style="list-style-type: none"> <li>• NDSU Extension/Barnes County</li> <li>• Farm Service Agency (FSA)</li> <li>• Active emergency management department with education and outreach available on the department’s website</li> <li>• Barnes County and City of Valley City websites; radio station - KOVC</li> </ul> <p><u>Financial</u></p> <ul style="list-style-type: none"> <li>• FSA has programs designed to financially assist farmers in times of need (FLP, LIP, LFP, ELAP – livestock)</li> <li>• National Resources Conservation Service (ECP – livestock) – can also be administered by FSA</li> <li>• USDA, Risk Management Agency crop insurance subsidized by federal government</li> <li>• USDA Rural Development-REAP grants</li> <li>• Rural water district</li> </ul> <p><u>Planning and Regulatory</u></p> <ul style="list-style-type: none"> <li>• <b>NDDDES Fire Index</b></li> <li>• <b>Barnes County implements burn bans where necessary</b></li> <li>• State implements burn bans – needs updating/improvement</li> <li>• Farmers receiving USDA benefits required to have a highly erodible plan of operation in place</li> <li>• Barnes County Rural Water District – has drought management and water conservation plans in place</li> </ul>
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### **Vulnerabilities to Publicly-Owned Buildings and Property**

Drought has not had a direct impact on buildings and property in Barnes County. Loss of water supply would influence the function of publicly-owned buildings and property. Disruptions in service and extended periods of closure may occur. Drought would threaten publicly-owned buildings and property from the increase in fire threat and the potential decrease in available water for fire suppression.

A summary of publicly-owned buildings is provided in Chapter 3, Profile and Inventory.

### **Vulnerabilities of Critical Facilities and Infrastructure**

Critical facilities that rely on water for operation and continued use are most vulnerable to drought. Large employers in the agriculture and manufacturing sectors can be negatively affected by drought and are viewed as critical facilities, depending on the number of people they employ and the impact they have on local economies.

According to the 2018 ND Enhanced Mitigation MAOP, the largest water user in 2016 by reported use was the city of Valley City in Barnes County. Since municipal water supplies are drawn from local bodies of water, drought could have a significant impact on critical facilities and infrastructure such as government buildings, public schools, hospitals, correctional centers, and senior housing developments.

If a severe drought persists, water levels in Lake Ashtabula may be reduced and contribute to a decline in availability of drinking/potable water, outdoor recreation, and tourism.

### **Vulnerabilities to New and Future Development**

The greatest vulnerability from drought to new and future development would be underground water sources, the agriculture industry, and energy development. New development has the potential to diminish underground sources with increases in population and economic activity as municipal water is sourced from aquifers and local bodies of water. Individuals with wells and septic systems are not regulated and are more susceptible to drought.

The agriculture sector is becoming increasingly precision-based with advanced technological systems, which can simultaneously increase or decrease the demand for water and the vulnerability of drought in Barnes County.

Drought conditions could be exacerbated if industrial or energy development in Barnes County occurred. According to Barnes County Economic Development, water as a raw material for industrial development is in short supply.

According to the Garrison Diversion Conservancy District (GDCCD), a pipeline carrying water from the Missouri River to the Jamestown Area is in the planning stages. The project, called the **Central Dakota Water Supply Project**, would draw water from the McClusky Canal near New Rockford and routing a pipeline south to Spiritwood, N.D. The GDCCD did an environmental analysis on the project and the Bureau of Reclamation has approved it. As of December 2020, GDCCD is now negotiating the purchase price for water out of the McClusky Canal. **Check on current water projects with Rich.**

With the possibility of climate change, the state can expect drought conditions affecting certain counties and regions to occur more frequently. Drought will impact Barnes County with more frequency and increased severity.

### **Data Limitations and Other Key Documents**

A data limitation for understanding impacts from drought is the difficulty in identifying the true extent of the drought in terms of time, or when a drought begins and when a drought concludes. Characteristics of drought are hard to distinguish between periods of dryer than normal conditions and cyclical weather patterns. Droughts tend to impact areas slowly and is not sudden like other hazards such as severe winter weather or flooding. In addition, impacts of drought are far reaching and tend to have a trickle-down effect on many sectors of the economy. Therefore, a process to determine near accurate loss estimates for drought is challenging, at best.

According to the Farm Services Agency, crop loss due to drought is calculated at harvest time due to planted acres determined at the beginning of the season. Therefore, the data could be skewed due to prior impacts from other hazards.

This plan incorporates data from the following documents. Information from this plan will be incorporated in the update of the following documents.

- 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)
- Barnes County Comprehensive Plan
- Barnes County Commercial Animal Feed Operation Ordinance
- Barnes County Local Emergency Operations Plan
- Barnes County Threat and Hazard Identification and Risk Assessment (THIRA)
- Barnes County Water Resource Board/District (drought and water conservation plans)
- City-County Health District Evacuation and Shelter Plan
- City-County Health District Shelter and Mass Care Plan
- NDSU Extension Statewide Drought Resource Page (online)
- NDSU Extension Feed/Hay List
- North Dakota Continuity of Operations Plan
- North Dakota Drought Response Plan
- North Dakota Emergency Operations Plan, Drought Annex
- North Dakota State Disaster Recovery Plan
- North Dakota State Preparedness Report (SPR)
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

## 4.6 Fire

Including urban fire/structure collapse, rural fire, and wildland fire.

### Characteristics

Fire is the rapid oxidation of a material in the exothermic chemical process of combustion, releasing heat, light, and various reaction products.

Structure-Urban Fire. Structure fire is the result of three components: a heat source, a fuel source, and an oxygen source per the U.S. Fire Administration. When combined, these three sustaining factors will allow a fire to ignite and spread. Within a structure, a small flame can get completely out of control and turn into a major fire within seconds. Thick black smoke can fill a structure within minutes. The heat from a fire can be 100 degrees Fahrenheit at floor level and rise to 600 degrees at eye level. In five minutes, a room can get so hot that everything in it ignites at once; this is called flashover.

Structure Collapse. Structure collapse occurs when the forces of gravity or other external forces overcome the structural integrity of a building. The reasons for structure collapse can vary from poor construction to explosions to extreme winds to heavy snow loads. Structure collapse can trap occupants and damage property. In Barnes County, numerous commercial, private elevators and large storage bins could be subject to structure collapse. Cattle operations have large cattle confinement structures that are also at risk of collapse. Urban fire/structure collapse can happen independently from other incidents.

Rural Fire. Rural fires result from farming activities whereby farm equipment may ignite a fire while haying, harvesting and other farming activities.

Wildland Fire. A wildland fire is an uncontrolled fire in a vegetated area. Wildland fires are a natural part of the ecosystem. They have a purpose in nature and following years of fire suppression, many areas have built up fuels that can lead to larger, more intense fires.

<b>Seasonal Pattern</b>	<b>Urban Fire/Structure Collapse</b> – None. Probability is always more prevalent in urban areas due to large concentrations of structures <b>Rural and Wildland Fire</b> – More prevalent during summer months
<b>Duration</b>	<b>Rural and Urban Fire/Structure Collapse</b> – Minutes/hours/days <b>Wildland Fire</b> – Minutes/hours/days, up to weeks in exceptional cases
<b>Speed of Onset</b>	Little to no warning.
<b>Location</b>	<b>Urban Fire/Structure Collapse</b> – incorporated jurisdictions <b>Rural and Wildland Fire</b> – rural areas of the county but may spread to incorporated jurisdictions

For more information regarding urban fire/structure collapse and wildland fire please reference the **2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)**. The state plan can be accessed by following the electronic hyperlink or link to the N.D. Dept. of Emergency Services website:

[2018 North Dakota Enhanced Mitigation Mission Area Operations Plan  
https://www.des.nd.gov/planning](https://www.des.nd.gov/planning)

**Chapter 4.6.1 profiles urban fire/structure collapse and Chapter 4.6.2 profiles wildland fire.**

## 4.6.1 Urban Fire/Structure Collapse

### History

Statistical information on incidents of urban fire/structure collapse is provided by the National Fire Incident Reporting System (NFIRS), Valley City Fire Department, Valley City Rural Fire Protection District, and the 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP).

Tables 4.6.1.1 illustrates the history of urban fire/structure collapse for fire agencies based in Barnes County. The data was tabulated by the National Fire Incident Reporting System (NFIRS) and provided by the N.D. State Fire Marshal's Office. The National Fire Incident Reporting System (NFIRS) is another source to obtain and analyze urban fire/structure collapse incidents. The data is summarized by fire department and district the number of structure fires, vehicle fires, and unclassified (other) fires from January 1, 2000, through December 31, 2019. This information is used to help better understand the risk of urban fire/structure collapse in Barnes County in and outside Valley City.

A detailed hazard history for Barnes County can be found on a disc located at the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment.

The following are key points from Table 4.6.1.1.

- A total of 277 structure fires, 153 vehicle fires, and 240 other fires between January 1, 2000, and December 31, 2019, for a total of 670 fire calls. In addition, local fire agencies responded to 214 rescue calls (174 medical and 33 other).
- Approximately 51.1 percent (89 – which are sometimes combined with EMS) of all medical calls were received by Wimbledon Fire Protection District. Fire departments are included on medical calls when they are in response to an accident, lift assistance or a specialized rescue.
- Fire losses from fire only totaled \$3,347,337 between January 1, 2000, and December 31, 2019, while combined with other losses totaled \$3,324,887 during the same time frame.

### Valley City Fire Department and Valley City Rural Fire Protection District

Table 4.6.1.2 and 4.6.1.3 summarizes the history of urban fire/structure collapse for the Valley City Fire Department and Valley City Rural Fire Protection District in 2019 and 2020. The following key points summarize data the department's history from 2015 to 2018 as provided by the fire chief, and data in Tables 4.6.1.2 and 4.6.2.3.

- In 2015, a total of 100 calls were received, of which 75 were city, 29 were rural, and five were rescue. One call for a car fire was received. Reported losses were \$100,000.00.
- In 2016, a total of 123 calls were received, of which 81 were city, 23 were rural, and 12 were rescue. There were 12 calls for car fires. One fatality occurred. Reported losses were \$107,500.00.
- In 2017, a total of 143 calls were received, of which 97 were city, 31 were rural, and 15 were rescue. Reported losses were \$75,000.00.

- In 2018, a total of 95 calls were received, of which 52 were city, 29 were rural, and 14 were rescue. Reported losses were \$80,000.00.
- In 2019, a total of 134 calls were received, of which 87 were city, 16 were rural, and 31 were rescue.
- In 2020, a total of 153 calls were received, of which 99 were city, 26 were rural, and 28 were rescue.

**Table 4.6.1.1 – January 1, 2000, to December 31, 2019, Barnes County Urban Fire/Structure Collapse Hazard History Summary**

Fire Protection Agency	Fires				Rescue Calls			Losses	
	Struc.	Vehicle	Other	Total	Med.	Other	Total	Fire Only	Total
Dazey Fire Dept.	0	1	0	1	7	0	7	\$4,000.00	\$4,000.00
Dazey Fire Prot. Dist.	0	4	11	15	17	1	18	\$55,650.00	\$57,650.00
Edna Fire Prot. Dist.	0	0	0	0	0	0	0	\$0.00	\$0.00
Fingal Fire Prot. Dist.	17	3	28	48	0	4	4	\$391,147.00	\$391,847.00
Kathryn Fire Prot. Dist.	0	2	4	6	28	0	28	\$0.00	\$0.00
Litchville Fire Dept.	0	0	0	0	0	0	0	\$0.00	\$0.00
Litchville Rural Fire Dept.	2	0	1	3	1	0	1	\$600.00	\$600.00
Nome Fire Prot. Dist.	1	1	0	2	0	0	0	\$0.00	\$0.00
Oriska Fire Dept.	0	0	0	0	0	0	0	\$0.00	\$0.00
Rogers Fire Dept.	2	0	1	10	0	0	0	\$300,000.00	\$300,000.00
Sanborn Fire Dept.	3	7	3	17	13	0	13	\$65,000.00	\$65,000.00
Sanborn Fire Prot. Dist.	7	11	15	32	54	2	56	\$118,000.00	\$173,100.00
Sibley Fire Dept.	0	10	1	2	0	1	1	\$0.00	\$0.00
Valley City Fire Dept.	199	55	25	279	47	25	72	\$952,795.00	\$961,295.00
Valley City Rural Fire Prot. Dist.	46	59	151	256	14	0	14	\$678,945.00	\$680,195.00
Wimbledon Fire Prot. Dist.	6	11	27	44	89	3	92	\$681,200.00	\$691,200.00
<b>TOTAL</b>	<b>277</b>	<b>153</b>	<b>240</b>	<b>670</b>	<b>174</b>	<b>33</b>	<b>214</b>	<b>\$3,247,337.00</b>	<b>\$3,324,887.00</b>

Source(s): National Fire Incident Reporting System (NFIRS)

Fire departments from neighboring counties have coverage over parts of Barnes County either through mutual aid agreements or their respective fire district extends into the county. Total number of fires reported may be more than what occurred in the county. As such, data from departments in neighboring counties was excluded to avoid skewing of data history and is shown for supportive purposes of the continued need for investment of funding into fire departments and districts in Barnes County.

### Probability

The probability of a hazard or threat is how likely it is it will happen. Per Tables 4.6.1.1, 4.6.1.2, and 4.6.1.3 in the history portion of this profile, the probability of urban fire/structure collapse in Barnes County is 100 percent based on the following information.

#### National Fire Incident Reporting System (NFIRS)

- An average of 34 fire calls per year between January 1, 2000, and December 31, 2019, or approximately 14 structure fires, eight vehicle fires, 12 other fires annually. Barnes County experiences, on average, \$162,366.85 in fire losses and \$166,244.35 in other losses annually.

### Valley City Fire Department and Valley City Rural Fire Protection District

- An average, Valley City Fire Department and Valley City Rural Fire Protection District receive 11 calls per month in 2019 and 13 calls per month in 2020.

### 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)

- According to the 2018 N.D. Enhanced Mitigation MAOP, the fire hazard ranking for Barnes County is low.

Profile meeting participants indicated the probability of urban fire/structure collapse in Barnes County as highly likely meaning there is a 100 percent chance of an incident in the next year.

### **Extent/Magnitude**

The extent/magnitude of a hazard or threat is expressed in the amount and/or number of damages or losses either actualized in a community or estimated based on known assets and levels of risk. The extent/magnitude of a structure fire can range anywhere from negligible for small exterior or interior fires extinguished without professional help to catastrophic for fires threatening structural integrity of critical facilities and infrastructure, sometimes resulting in loss of service or demolition. A catastrophic incident would be the total loss of the Barnes County Courthouse, Barnes County Law Enforcement Center, and emergency services building such as a fire hall or ambulance garage, public schools, care centers/nursing homes, CHI-Mercy Hospital, major employers, Valley City City Hall, or transportation infrastructure. In addition, if an incident were to occur at an industrial subdivision, pipeline, or Tier II site, a catastrophic hazardous material release may occur with the potential to result in hundreds-of-thousands to millions-of-dollars in property damage, lost economic activity, shutting down of major transportation infrastructure, or mass casualties/fatalities.

- According to data provided by the NFIRS and the Valley City Fire Department, communities/fire agencies in Barnes County experienced \$3,247,337.00 in fire losses and \$3,324,887.00 in total losses (including fire) between January 1, 2000, and December 31, 2019.
- The extent/magnitude for structure fires in terms of human life can be categorized as catastrophic as any loss of life would have a significant impact on a community. According to Valley City Fire Department, one fatality occurred in 2016.

Profile meeting participants indicated the extent/magnitude or impact of urban fire/structure collapse as catastrophic meaning substantial damage to the jurisdiction and its people could occur, depending on the structure.

**Table 4.6.1.2 – 2019 Valley City Fire Department and Valley City Rural Fire Protection District Urban Fire/Structure Collapse Hazard History Summary**

<b>2019 Valley City Fire Department and Valley City Rural Fire Protection District Incident History</b>					
<b>Time</b>	<b>Date</b>	<b>Location</b>	<b>Address</b>	<b>Findings</b>	<b>Authority</b>
16:28	1/5/2019	Landmark 2	355 2nd St NW	Faulty detector	City
22:28	1/10/2019	Sw Part of town	8th Ave SW	Grease from a truck	City
16:40	1/11/2019	VC child care	141 4th Ave NE	Child pulled alarm	City
11:20	1/18/2019	Senior Center	139 2nd Ave SE	Dirty electric Heater	City
13:02	1/21/2019	MM 290	MM 290 I-94	one vehicle rollover	Rescue
17:02	1/21/2019	VFW Club	138 Main St E	Faulty Detector	City
17:00	1/25/2019	Jeremy Dahl	413 6th Ave NE	Co Detector	City
12:36	1/29/2019	VFW Club	138 Main St E	Faulty Detector	City
13:13	1/29/2019	Condo	205 4th St NE # 4	Faulty detector	City
15:13	1/29/2019	VFW Club	138 Main St E	Faulty detector	City
14:00	1/30/2019	Deb,Russ Thompson	1000 8th Ave NE	natural Gas leak	City
11:04	2/1/2019	I-94 MM 286	I -94	Rescue call	Rescue
18:54	2/2/2019	Youth sports complex	900 Block N central	Fire Alarm	City
16:30	2/5/2019	Pinnicole Bldg	200 Block 6th Ave NW	Overcooked bacon	City
14:44	2/8/2019	Mary Heath	326 4th St NW	Faulty detector	City
11:22	2/12/2019	MM293	I-94	Rollover	Rescue
13:52	2/12/2019	john deere seeding	1725 7th st SE	Heating System	City
08:43	2/21/2019	MM 292	I-94 MM 292	Rollover	Rescue
11:23	2/22/2019	Group home 4	491 2nd Ave NE	Faulty generator	City
16:29	2/25/2019	Residential	946 3rd Ave NW	Phone alert	City
22:56	2/25/2019	MM280	I-94 MM 280	Rollover	Rescue
15:10	2/26/2019	MM277	I-94 MM 277	Semi vs car	Rescue
20:32	2/26/2019	Viking trailer	1100 blk Viking dr	Gas line break	City
11:43	3/1/2019	I-94 MM 301	MM301 I-94	Semi VS tow truck	Rescue
22:30	3/1/2019	Group home 2	220 5th Ave SW	Bad regulator	City
22:16	3/2/2019	I-94 MM 293	I-94 MM293	Semi Fire	Rural
14:54	3/4/2019	5 West hiway 1 and 46	5 west Hiway 1 and 46	Rollover	rescue
07:01	3/6/2019	744 5th Ave NW	744 5th Ave NW	C0 Detector	City
00:15	3/8/2019	ND Wintershow	Wintershow road	Gas leak	City
12:45	3/8/2019	Liquor Locker	124 Central Ave S	Gas Leak	City
18:39	3/9/2019	Ryan Froemke	731 5th Ave NW	C0 Detector	City
11:16	3/10/2019	I-94 MM302	I-94 MM 302	Rollover	Rescue
11:16	3/10/2019	I-94 MM3 300	I-94 MM 300	Rollover	Rescue
22:00	3/12/2019	James Verway	760 6th Ave NE	C0 Detector	City
09:40	3/12/2019	I-94 MM 286	I-94 MM 286	Rollover	Rescue
11:39	3/12/2019	I-94 MM 294	I-94 MM 294	Rollover	Rescue
09:42	3/15/2019	Petro Serve	8th Ave SW	T&T Hit Gas pump	City
00:19	3/23/2019	VFW	138 Main St E	Fire Alarm	City
08:45	3/27/2019	Irish Properties	253 Central Ave N	Man stuck in elev	City
11:55	3/29/2019	mutual aid	13400 23th St SE	2 Vehicle Crash	Rescue
18:34	3/30/2019	Sheyenne Care	979 Central Ave N	General alarm	City
06:22	4/1/2019	VC Sr. High school	493 Central Ave N	Dirty detector	City
09:00	4/2/2019	Irish Properties	253 Central Ave N	Man stuck in elev	City
21:10	4/4/2019	I-94 MM 300	I-94 MM 300	Rollover	Rescue
11:27	4/12/2019	I-94 MM 286	I-94 MM 286	Car in water	Rescue
08:24	4/13/2019	I-94 MM 289	I-94 MM 289	Rollover	Rescue

Source(s): Valley City Fire Department



**Table 4.6.1.2 – 2019 Valley City Fire Department and Valley City Rural Fire Protection District Urban Fire/Structure Collapse Hazard History Summary – Continued**

<b>2019 Valley City Fire Department and Valley City Rural Fire Protection District Incident History</b>					
<b>Time</b>	<b>Date</b>	<b>Location</b>	<b>Address</b>	<b>Findings</b>	<b>Authority</b>
06:02	4/14/2019	I-94 MM301	I-94 MM 301	Rollover	Rescue
16:30	4/21/2019	Petro serve	8th ave sw	Fuel leak	City
09:00	4/22/2019	100 blk 6th Ave NE	100 blk 6th Ave NE	odor investigation	City
15:10	4/24/2019	I-94 MM 301	I-94 MM 301	1 Vehicle rollover	Rescue
19:13	5/4/2019	3902 117th Ave SE	3902 117th Ave SE	Hay Bales	Rural
09:55	5/5/2019	3902 117th Ave SE	3902 117th Ave SE	Hay Bales/ grass	Rural
18:00	5/7/2019	Pinnicol bldg	2nd St 6th Ave NW	cooking	City
09:30	5/9/2019	I-94	MM 302 I-94	Semi/haybales	Rural
14:15	5/11/2019	42nd St SE	42nd st SE	Field ditches	Rural
02:04	5/12/2019	12th st & 9th Ave NW	12th St & 9th Ave NW	pickup/power pole	City/rescue
17:58	5/12/2019	3205 121 St Se	3205 121 St SE	grass	Rural
15:12	5/13/2019	.05 mile N on peak road	Peak road	Car fire	Rural
15:23	5/14/2019	Norma sect 19	norma sect 19	Grass	Rural
15:16	5/15/2019	Randy Cooks	12039 18th St SE	Combine	Rural
13:36	5/15/2019	anthony tilmony	12109 37th St SE	Trees/grass	Rural
17:54	5/15/2019	Mark Schlotman	3147 114th Ave SE	Trees/grass	Rural
17:00	5/18/2019	Family dollar	1346 W Main St	Propane issue	City
09:00	5/20/2019	BCBS	2509 West Main	CO detection	City
13:00	5/22/2019	Irish Properties	253 Central Ave N	man in elevator	City
20:58	5/26/2019	VFW	138 Main St E	Strong odor	City
11:59	5/29/2019	Pinnical Bldg	2nd St 6th Ave NW	burnt food	City
13:00	5/30/2019	Joe Scherr	513 Legacy lane	Bad detectors	City
09:30	5/31/2019	summit prop	700 12th St NW	gas smell	City
11:59	6/8/2019	625 Central Ave N	625 Central Ave n	Gas line hit	City
20:28	6/9/2019	MM 298 I 94	MM 298 I-94	Rollover	Rescue
16:17	6/11/2019	33rd ST SE	33rd St SE	Railroad Ties	Rural
13:51	6/12/2019	200 block S central	200 Blk South Central	Deceased Individual	City/rescue
18:38	6/12/2019	148 central ave S	148 Central Ave S	Gas line broken	City
01:22	6/13/2019	1000 Block 12th Ave NW	1000 Blk Central Ave Nw	accident with hazard	city/rescue
08:09	6/14/2019	Pinnicol Bldg	2nd St 6 th Ave NW	Cooking	City
11:23	6/19/2019	241 3rd St SE	241 3rd St SE	Apt Fire	City
20:52	6/26/2019	365 3rd Ave NW	365 3Rd Ave NW	Burnt food	City
15:30	6/30/2019	Airport Road	Airport Road	Dog in sewer	City
21:00	7/5/2019	240 East Main St	240 East Main Street	Strong odar	City
17:56	7/9/2019	VC High School	493 Central Ave N	Alarm	City
09:36	7/10/2019	B C Courthouse	230 4th St NW	Alarm	City
15:32	7/10/2019	Kennelly Law	253 Central Ave N	Man in elevator	City
02:24	7/15/2019	Valley Bluffs	1035 East Main	Cooking	City
02:20	7/16/2019	rescue	East of Cuba exit	Rollover	Rescue
14:02	7/20/2019	Swanberg Construction	s of exit 292	grass fire	Rural
14:26	7/25/2019	Leal ND	Hiway 9	Truck VS Train	Rescue
21:10	7/27/2019	709 4th St NE	709 4th st ne	tree fire	City
15:53	7/28/2019	709 viking Circle	709 viking circle	hotwater malf	City
15:29	7/31/2019	2nd St 3rd Av e NE	2Nd St 3rd Ave NE	Scooter issues	city
08:00	8/1/2019	John Deere Seeding	1725 7th St SE	working on panel	City
20:55	8/2/2019	Barr Resident	469 6th Ave NE	Electric panal	City

Source(s): Valley City Fire Department

**Table 4.6.1.2 – 2019 Valley City Fire Department and Valley City Rural Fire Protection District Urban Fire/Structure Collapse Hazard History Summary – Continued**

<b>2019 Valley City Fire Department and Valley City Rural Fire Protection District Incident History</b>					
<b>Time</b>	<b>Date</b>	<b>Location</b>	<b>Address</b>	<b>Findings</b>	<b>Authority</b>
20:51	8/12/2019	Gaukler center	733 8th Ave SW	child in elevator	City
15:30	8/14/2019	Jefferson school	1100 BLK N Central Ave	Testing Alarm	City
05:50	8/22/2019	Residential	1114 2nd St SE	Pickup Fire	City
20:24	8/24/2019	Econolodge	455 wintershow drive	Trouble alarm	City
21:41	8/29/2019	Hillside cemetary	33 St 119th Ave	Rollover	Rescue
14:44	9/4/2019	MM296	MM296 I 94	Rollover	Rescue
09:41	9/10/2019	Jefferson School	1150 central ave N	False Alarm	City
16:00	9/10/2019	Larry Trapp	420 12 Ave NE	Sewer Smell	City
13:58	9/13/2019	Grainger heights	565 10th Ave SE	over cooked food	City
20:09	9/18/2019	mm290 south	mm 290 south	controled burn	City
13:00	9/20/2019	Mercy Hospital	570 Chautauqua Blvd	water Alarm	City
00:15	9/21/2019	Sheyenne Apts	220 South Central	Dirty detector	City
09:11	9/22/2019	640 4th St NE	640 4th St NE	Bathroom fire	City
16:00	9/22/2019	Sheyenne river	County Road 21	Water search	Rescue
12:22	9/25/2019	ND Dot	1524 8th Ave SW	MDU line hit	City
08:00	9/26/2019	Sheyenne river	County Road 21	Water recovery	Rescue
07:43	9/26/2019	MM 290 I 94	MM 290 I 94	Semi Fire	Rural
13:13	9/29/2019	MM284 I 94	MM 284 I 94	2 Vehicle accident	Rescue
15:39	10/4/2019	Viking trailer park	815 12th Ave SW	Smoke	City
18:16	10/7/2019	Pinnicol Building	739 2nd St NW	Overcooked food	City
06:21	10/9/2019	MM276 I 94	MM 276 I 94	Rescue/ cancelled	Rescue
11:31	10/10/2019	Tri W G	215 12th Ave NE	Smoke Oder	City
23:51	10/11/2019	Todd Wittenberg	2305, 118th Ave SE	House Fire	Rural
13:44	10/16/2019	MM 302 I 94	MM 302 I 94	Rollover	Rescue
00:59	10/26/2019	Nials Burchill	852 8th Ave NW	Co Detecor	City
01:55	10/26/2019	Sheyenne Apts	230 Central ave S	Smoke smell	City
18:40	10/27/2019	Nazarene Church	320 Central Ave S	Detector	City
18:44	11/5/2019	1030 7th St SE	1030 7th St SE	woodburner	City
14:45	11/7/2019	218 4th St SW	218 4th St SE	Gas odor	City
06:45	11/13/2019	Hi soaring ranch	3731 117th Ave SE	Dirty Detector	Rural
22:41	11/13/2019	739 4th St NE	739 4th St NE	overheated outlet	City
02:43	11/23/2019	Hiway 21	1 mile s katheryn	Rollover	Rescue
13:27	11/23/2019	Columbia grain	3394 hiway 10	grain dryer fire	Rural
13:38	11/27/2019	Hoefs	1345 9th St SE	overcooked food	City
18:03	11/27/2019	MM 292 I 94	Mm 292 I-94	Towing pickup	rural
10:03	11/28/2019	Mercy hospital	570 Chautauqua	faulty detector	City
15:17	11/29/2019	Kabor	632 6th Ave SW	Mattress fire	City
11:18	12/1/2019	MM 307 I-94	MM 307-I-94	Semi Rollover	Rescue
14:30	12/6/2019	VC High School	493 Central Ave N	Faulty Detector	City
17:12	12/9/2019	City Lights	2369 Elm St	Gas Explosion	City
08:52	12/11/2019	VCFD	241 3rd Ave NE	Faulty Heater	City
13:00	12/19/2019	Al Schumaucher	750 4th St NW	Strong odor	City
22:02	12/16/2019	MM 307 I-94	MM 307 I-94	Rollover	Rescue
13:26	12/19/2019	FEI Frontage road	913 14th St SW	Gas line hit	City
17:26	12/27/2019	Group home 2	240 4th Ave SE	Cooking Issue	City

Source(s): Valley City Fire Department

**Table 4.6.1.3 – 2020 Valley City Fire Department and Valley City Rural Fire Protection District Urban Fire/Structure Collapse Hazard History Summary**

<b>2020 Valley City Fire Department and Valley City Rural Fire Protection District Incident History</b>					
<b><i>Time</i></b>	<b><i>Date</i></b>	<b><i>Location</i></b>	<b><i>Address</i></b>	<b><i>Findings</i></b>	<b><i>Authority</i></b>
21:26	1/1/2020	Group home 01	220 5th Ave SW	Faulty Water heater	City
20:09	1/3/2020	Highway 32 S	MM 57 Highway 32 S	one vehicle rollover	Rescue
20:12	1/6/2020	I-94 MM 295	MM 295 I-94	Semi Rollover	Rescue
15:25	1/9/2020	855 1th St NW	855 12th St NW	Burnt Food	City
15:32	1/11/2020	Sheyenne Apts	230 S central # 7	Burnt Food	City
12:50	1/12/2020	Bob Burchill	462 6th Ave NE	Odor Investigation	City
20:20	1/12/2020	SCC	979 Central Ave N	False Alarm	City
18:54	1/14/2020	Liquor Locker	124 Central Ave S	Dirty Furnace	City
09:30	1/15/2020	BC Courthouse	230 4th St new	Dirty detector	City
03:15	1/16/2020	Viking Tailer Park	748 12th Ave SE	Garbage Can Fire	City
07:40	1/20/2020	Stoudt Ross Ford	325 winter show Rd	Gas Smell	City
15:00	1/20/2020	John Deere Seed	1725 7th St SE	Sprinkler pipe fail	City
18:30	1/21/2020	I-94 MM 284	MM 284 I 94	one vehicle rollover	Rescue
08:30	1/26/2020	Wittenberg	2815 122 ND Ave SE	CO Detector	Rural
11:48	1/27/2020	Sheyenne Apts	230 S central Parking	Vehicle Fire	City
08:43	2/4/2020	Multi Dwelling	726 2nd St NW	Fire Alarm 206	City
11:35	2/4/2020	Roadway	8th Ave SW	Wheel bearing	City
20:00	2/6/2020	Tech Center	415 Wintershow RD	Malfunction Heater	City
22:29	2/9/2020	Divided Hiway	MM 305 I-94	1 Vehical rollover	Rescue
13:56	2/11/2020	Multi Dwelling	535 4th Ave SW	Lift Assist	City
07:41	2/7/2020	Single Family	849 5th Ave NW	Odor	City
20:17	2/7/2020	Single Family	849 5th Ave NW	Odor	City
07:53	2/15/2020	Single Family	849 5th Ave NW	Odor	City
09:36	2/15/2020	Agriculture	700 7th ST SE	Possible Smoke	City
20:42	2/17/2020	Multi Dwelling	261 10th St SE	Fire Alarm	City
23:07	2/20/2020	Tractor Trailer	Exit 292 I -94	Brakes on fire	Rural
12:40	2/21/2020	Roadway	10 miles s Peak Rd	Rollover	Rescue
20:43	2/26/2020	Residential	522 8th St NE	Explosion	City
03:49	2/27/2020	Residential	522 8th St NE	Rekindle	City
21:32	2/28/2020	Multi Dwelling	1445 4th Ave NE	Detector	City
08:57	2/29/2020	Divided Hiway	MM 286 I-94	Rollover	Rescue
1600	3/5/2020	Single family	849 5th Ave NW	Sewer gas	City
2043	3/9/2020	Single family	650 6th St SE	Co Alarm	City
1300	3/10/2020	Single family	628 2nd St SW	Co Alarm	City
1812	3/12/2020	Multi Family	230 S Central Ave	Lift Assist	City
1252	3/17/2020	Motel	280 wintershow Rd	heater malfunction	City
1139	3/19/2020	Divided Hiway	Highway 1 & 46	Rollover	Rescue
2007	3/22/2020	Single family	3585 sunrise Dr	House fire	Rural
951	3/23/2020	Car fire	158 5th St SW	Car fire	City
1529	3/29/2020	Single family	849 5th Ave NW	Kitchen Fire	City
643	3/30/2020	Multi Family	120 12th St NW	faulty detector	City
1400	3/31/2020	Single family	849 5th Ave NW	Smoke Smell	City
16:10	4/1/2020	Single family	1026 7th Ave NW	Bad CO Detector	City
03:24	4/2/2020	Divided Hiway	I-94 MM 301	Semi rollover	Rescue
16:47	4/2/2020	Divided Hiway	I-94 MM 276	Car in the water	Rescue
23:14	4/5/2020	Multi Family	120 12th St NW	Dumpster fire	City

Source(s): Valley City Fire Department

**Table 4.6.1.3 – 2020 Valley City Fire Department and Valley City Rural Fire Protection District Urban Fire/Structure Collapse Hazard History Summary – Continued**

<b>2020 Valley City Fire Department and Valley City Rural Fire Protection District Incident History</b>					
<b>Time</b>	<b>Date</b>	<b>Location</b>	<b>Address</b>	<b>Findings</b>	<b>Authority</b>
18:13	4/11/2020	Roadway	1 M North of peak	Grass Fire	Rural
12:25	4/22/2020	Single family	1871 97th Ave SE	Man in sewer	Rescue
17:00	4/19/2020	single family	500 blk of 3rd ave NE	CO detector	City
14:09	4/26/2020	Divided Hiway	I-94 MM 285	2 vehicle head on	Rescue
22:21	4/29/2020	Single family	11808 33rd ST SE	Vehicle fire	Rural
16:31	4/30/2020	Divided Hiway	I-94 MM 302	Rollover	Rescue
18:36	4/30/2020	Creek	Katheryn	Drowning	Rescue
19:34	5/2/2020	Multi Family	230 South Central	Dirty Detector	City
15:24	5/3/2020	Single Family	1048 5th St SW	Grass fire/BBq grill	City
18:05	5/10/2020	Intersection	115 35th St SE	Semi TankFuel Leak	Rural
20:43	5/12/2020	Pasture	12406 36th St SE	Pasture/ burn pit	Rural
10:36	5/15/2020	Single Family	961 Hanna Ave	Dirty CO Detector	City
14:42	5/15/2020	Commercial	142 E Main St	Grass Smell	City
15:00	5/15/2020	Roadway	North Valley	Grass fire	Rural
11:52	5/18/2020	Divided Hiway	I-94 MM 294	Grass Fire	Rural
15:33	5/27/2020	Landfill	11490 35th St SE	Grass,Poles	Rural
21:53	5/27/2020	Divided Hiway	I-94 MM 287	One Vehicle Crash	Rescue
11:10	5/28/2020	Landfill	11490 35th St SE	Poles rubbish	Rural
17:42	6/1/2020	Roadway	126thAve 33rd St SE	Grass fire	Rural
17:46	6/1/2020	Commercial	145 N Central Ave	Gas Leak	City
12:30	6/2/2020	Single family	3319 114th Ave SE	CO detector	Rural
14:49	6/4/2020	Industrial	914 14th ST SW	Gas line hit	City
08:56	6/5/2020	Single family	722 4th Ave SW	House fire	City
10:44	6/9/2020	City Park	City Park	Power pole	City
09:05	6/10/2020	Assisted Living	570 13th ST NE	Fire Alarm	City
13:37	6/10/2020	Divided Hiway	3625 117th Ave SE	truck hit a tree	Rescue
05:04	6/11/2020	Interstate	MM 294 I-94	Rollover	Rescue
17:00	6/14/2020	Agriculture	Sec 31 Ashtabula tsp	Field fire	Rural
17:38	6/18/2020	Multi Family	220 6th Ave NW	Electrical fire	City
21:59	6/19/2020	Multi Family	120 12th St NW	Water break	City
22:56	6/19/2020	Roadway	100 Blk 12th Ave NE	Rollover	Rescue
20:00	6/24/2020	Agriculture	33rd St 121st Ave SE	Grass fire	Rural
05:38	6/26/2020	Agriculture	33rd St 121st Ave SE	Grass fire	Rural
19:50	6/28/2020	Multi Family	739 2nd ST NW	Smoke detector	City
21:13	7/3/2020	educational	Medicine wheel	Grass Fire	City
00:21	7/5/2020	Multi Family	540 12th St NE	Dumpster fire	City
22:02	7/5/2020	Agriculture	2825 109th Ave N	Grass Fire	Rural
23:17	7/5/2020	Single Family	523 7th St NE	Deck fire	City
15:55	7/6/2020	Divided Hiway	MM 281 I-94	MVC	Rescue
19:12	7/12/2020	Agriculture	Section 15 ashtabula	Grass fire	Rural
21:59	7/13/2020	Waterway	3rd Ave SE	Car in the river	Rescue
22:05	7/18/2020	Industrial	849 14th St SW	Booster pump	City
15:50	7/19/2020	Residential	722 4th Ave SW	Deck Fire	City
20:43	7/20/2020	Railroad	North Valley	Train Derailment	Rescue
07:49	7/29/2020	Multi Family	739 2nd St NW	Fire Alarm	City
10:24	8/4/2020	Nursing Home	979 Central Ave N	Reset alarm system	City

Source(s): Valley City Fire Department

**Table 4.6.1.3 – 2020 Valley City Fire Department and Valley City Rural Fire Protection District Urban Fire/Structure Collapse Hazard History Summary – Continued**

<b>2020 Valley City Fire Department and Valley City Rural Fire Protection District Incident History</b>					
<b><i>Time</i></b>	<b><i>Date</i></b>	<b><i>Location</i></b>	<b><i>Address</i></b>	<b><i>Findings</i></b>	<b><i>Authority</i></b>
22:55	8/4/2020	Median	MM-293 I-94	Grass Fire	Rural
11:51	8/10/2020	Multi Family	202 South Central	Reset alarm system	City
20:16	8/10/2020	Single family	1035 Chautauqua	CO Detector	City
03:02	8/11/2020	Divided Hiway	MM 302 I-94	one vehicle rollover	Rescue
14:25	8/11/2020	Truck	300 Blk 9th Ave NW	Propane line broke	City
11:00	8/12/2020	Industrial	1025 four bottle dr	Natural Gas odor	City
09:59	8/13/2020	Residential	500 blk 5th AVE NW	Natural gas break	City
16:00	8/25/2020	Commercial	148 Central Ave S	Natural gas Odor	City
17:32	8/25/2020	Multi Family	739 2nd St NW	Burnt Food	City
17:00	8/27/2020	Residential	652 5th Ave NW	Smoke Alarm	City
19:34	8/27/2020	Residential	135 5thAve SW	Body Removal	City
08:54	8/28/2020	Residential	3646 117th Ave SE	Structure fire	Rural
15:11	8/28/2020	Residential	3646 117th Ave SE	Rekindle	Rural
19:45	8/28/2020	Vehicle fire	151 South Central	Vehicle overheated	City
20:41	8/28/2020	Residential	3646 117th Ave SE	rekindle	Rural
08:34	8/29/2020	Residential	129 secarse Dr	Gas leak	City
17:00	8/29/2020	Divided Hi way	I-94 MM 291	Motorcycle accident	Rescue
22:47	8/29/2020	Residential	332 8th St NW	Smoke Detector	City
18:05	9/2/2020	Multi Family	536 10th Ave SE	Garage Fire	City
16:35	9/3/2020	Assembly	202 Central Ave S	Hydraulic leak	City
10:34	9/3/2020	Assembly	680 8th Ave SW	Alarm system	City
08:09	9/4/2020	Industrial	300 blk 10th St SW	Anhydrous leak	City
13:25	9/11/2020	Agriculture	39th St 126 Ave SE	Tractor fire	Rural
19:05	9/12/2020	Multi Family	151 Central Ave S	Smoke Smell	City
13:11	9/21/2020	Assembly	280 Wintershow rd	Smoke Detector	City
14:20	9/23/2020	Assembly	230 4th St NW	Elevator	City
07:57	9/28/2020	Roadway	700 Blk 5th Ave NW	Gas line hit	City
13:42	9/29/2020	Vehicle	200 blk 5th Ave NE	Garbage truck	City
15:50	10/3/2020	Assembly	540 3rd Ave NE	overheated pump	City
06:57	10/5/2020	Multi Family	120 12th St NW	Burnt toast Apt 101	City
18:45	10/6/2020	Single family	522 8th St NE	Natural gas leak	City
15:31	10/16/2020	Assembly	493 Central Ave N	boiler start up	City
08:55	10/17/2020	Multi Family	605 Central Ave N	painting Odor	City
07:30	10/18/2020	Assisted living	220 5th Ave SW	Burnt Food	City
09:18	10/22/2020	MM 278 I-94	MM 278 I-94	Rollover accident	Rescue
00:02	10/26/2020	Multi Family	210 wintershow rd	bad detector	City
08:04	10/26/2020	Industrial	1725 7 th St SE	waterflow alarm	City
18:20	10/27/2020	Multi Family	1120 5th St NE	Burnt Food	City
13:59	10/28/2020	Manufacturing	849 14th St SW	Water pipe break	City
20:04	10/29/2020	MM 298 I-94	MM 298 I-94	Rollover accident	Rescue
23:23	11/2/2020	Agriculture	151 9th Ave NW	Propane leak	City
05:28	11/3/2020	Trailer Park	1306 E Main	Trailer house fire	City
18:43	11/3/2020	agriculture	33rd Ave Hiway 27 SE	Controlled burn	Rural
22:37	11/5/2020	institutional	979 Central Ave N	Faulty Detector	City
07:25	11/9/2020	Multi Family	739 2ND St NW	Burnt Toast	City
17:56	11/14/2020	Agriculture	124th Ave 22nd St SE	Field Fire	Rural

Source(s): Valley City Fire Department

**Table 4.6.1.3 – 2020 Valley City Fire Department and Valley City Rural Fire Protection District Urban Fire/Structure Collapse Hazard History Summary – Continued**

<b>2020 Valley City Fire Department and Valley City Rural Fire Protection District Incident History</b>					
<b>Time</b>	<b>Date</b>	<b>Location</b>	<b>Address</b>	<b>Findings</b>	<b>Authority</b>
17:59	11/22/2020	Trailer park	1306 E Main	Gas Leak	City
21:45	11/22/2020	Divided Highway	I-94 298	Rollover	Rescue
23:53	11/23/2020	Divided Highway	I-94 279	Rollover	Rescue
17:10	11/27/2020	Retail	148 Central Ave S	Gas leak	City
13:39	11/28/2020	Waterway	Sheyenne river	Man 2 dogs in wtr	Rescue
18:00	12/2/2020	Multi Family	261 10th St SE	Burnt Toast	City
09:53	12/3/2020	Medical Facility	520 Chautauqua Blvd	Accidental pull st	City
11:58	12/9/2020	NG Maint Shop	2135 7th St SE	Natural gas break	City
15:30	12/10/2020	Single Family	959 7th Ave NW	H2S Gas odor	City
17:57	12/11/2020	multi Family	209 4th St Se	O2 level was low	City
07:26	12/12/2020	Divided Hiway	MM305	Rollover	Rescue
20:51	12/17/2020	Municipality	216 2nd Ave NE	oil leak in garage	City
10:13	12/18/2020	Multi Family	739 2nd Ave NW	Burnt Toast	City
07:40	12/20/2020	Church	680 8th Ave SW	waterflow Alarm	City
13:26	12/30/2020	Residential	11528 32ndJ ST SE	Attic Fire	Rural

Source(s): Valley City Fire Department

### Risk Assessment

Table 4.6.1.4 shows the risk assessment as determined by individual jurisdictions, the Steering Committee, and meeting participants at the profile meeting for urban fire/structure collapse. The risk assessment methodology can be found in the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA). The total in the table represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard/threat less the jurisdiction's capabilities to respond to the hazard/threat.

**Table 4.6.1.4 – Barnes County Urban Fire/Structure Collapse Risk Assessment Scored Chart Summary**

<b>Jurisdiction</b>	<b>Impact</b>	<b>Frequency</b>	<b>Likelihood</b>	<b>Vulnerability</b>	<b>Capabilities</b>	<b>Total</b>
Barnes County	4	3	4	3	2	<b>12</b>
Dazey	3	2	2	3	2	<b>8</b>
Fingal	3	3	3	4	1	<b>12</b>
Kathryn	2	2	3	3	2	<b>8</b>
Leal	2	2	2	3	1	<b>8</b>
Litchville	1	1	2	3	2	<b>5</b>
Nome	3	2	3	3	2	<b>9</b>
Oriska	2	3	3	3	1	<b>10</b>
Pillsbury	2	2	2	2	1	<b>7</b>
Rogers	3	2	2	3	1	<b>9</b>
Sanborn	2	2	3	4	2	<b>9</b>
Sibley	3	2	4	3	1	<b>11</b>
Valley City	4	3	3	3	2	<b>11</b>
Wimbledon	4	2	3	3	2	<b>10</b>

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 4.6.1.5 provides information on the specific impact, frequency, likelihood, vulnerability, and capability of urban fire/structure collapse in Barnes County. A list of impacts identified as commonplace for natural hazards and man-made threats regardless of the jurisdiction is shown at the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA).

### **Vulnerabilities to Publicly-Owned Buildings and Property**

All publicly-owned buildings and property are vulnerable to urban fire/structure collapse. The risk to the hazard depends on the location of the building and if it is equipped with fire suppression mechanisms, such as sprinkler systems and smoke detectors, among others. Risk to publicly-owned buildings and property also depends on the proximity of fire suppression equipment and response times from fire departments/districts. Older publicly-owned buildings may be more susceptible to fire being built prior to building and electrical codes. Publicly-owned buildings with flat roofs are more at risk to building collapse from snow loads. Flat-roofed buildings, whether publicly-owned or privately-owned, are typically located in the downtown area or older and/or more established neighborhoods of incorporated jurisdictions. A summary of publicly-owned buildings is provided in Chapter 3, Profile and Inventory.

In addition, publicly-owned buildings and property located near or adjacent to industrial facilities housing hazardous chemicals could be more at risk to urban fire/structure collapse.

### **Vulnerabilities of Critical Facilities and Infrastructure**

Like publicly-owned buildings and property, critical facilities and infrastructure are vulnerable to urban fire/structure collapse. If an incident were to occur, the critical facility or infrastructure impacted could result in loss of or delay in services. A fire affecting critical infrastructure such as power lines or lift stations could leave residents without power, potable water, or sanitary sewer, depending on the severity of the incident. Loss of communications from fire can also occur and result in a complete shutdown of daily operations of critical facilities and infrastructure. Communication infrastructure suspended in the air and not buried underground is most vulnerable.

### **Vulnerabilities to New and Future Development**

New and future development could be more vulnerable in communities that lack building codes. Buildings in jurisdictions that lack building codes could be more susceptible to snow loads, structural instability, and may lack fire suppression systems. Barnes County has adopted the state building codes (ICC International Building Code Year 2018, which covers new and future development in the county. Adoption and enforcement of building codes should reduce the risk and vulnerability to new and future development. However, the city of Valley City is the only incorporated jurisdiction in Barnes County that has building inspection services. An inventory of household units by type by jurisdiction in Barnes County is shown in Chapter 3, Profile and Inventory.

Strengthening of buildings codes would mitigate impacts from the hazard as populations grow and more people are at risk of injury and potential death. This mitigation project for the county can be found in Chapter 6, Mitigation Strategy.

**Table 4.6.1.5 – Barnes County Urban Fire/Structure Collapse Risk Assessment**

<p><b>Impact</b></p>	<ul style="list-style-type: none"> <li>Blocked Roads</li> <li>Building Collapse</li> <li>Business Interruptions/Loss of Economy</li> <li>Delayed Emergency Response</li> <li>Evacuation (Localized)</li> <li>Explosion</li> <li>Human Injury/Death</li> <li>Increased Fire Potential</li> <li>Mass Casualties/Fatalities</li> </ul>	<ul style="list-style-type: none"> <li>Loss of Power/Downed Power Lines</li> <li><b>Level of impact depends on the structure</b></li> <li>Communities/fire agencies in Barnes County experience \$3,247,337.00 in fire losses and \$3,324,887.00 in total losses (including fire) between January 1, 2000, and December 31, 2019.</li> </ul>
<p><b>Frequency</b></p>	<ul style="list-style-type: none"> <li>Annual occurrences of structures/vehicle fires</li> <li>Significant fire once every 5 to 10 years</li> </ul>	<ul style="list-style-type: none"> <li>An average of 34 fire calls per year between January 1, 2000, and December 31, 2019, or approximately 14 structure fires, eight vehicle fires, 12 other fires annually. Barnes County experiences, on average, \$162,366.85.40 in fire losses and \$166,244.35 in other losses annually.</li> </ul>
<p><b>Likelihood</b></p>	<p><u>More likely</u></p> <ul style="list-style-type: none"> <li>Close spacing and age of downtown structures</li> <li>Increased use of electric heaters and devices</li> <li>Outdated electric wiring and heating systems in older homes/buildings</li> <li><b>Older trees and unkept vegetation in city limits</b></li> </ul>	<p><u>Less likely</u></p> <ul style="list-style-type: none"> <li>Better building standards and maintenance of buildings</li> <li>Smoke detectors required by code</li> <li>Well-equipped fire departments with trained volunteers</li> <li>Annual inspections of commercial properties in Valley City</li> </ul>
<p><b>Vulnerability</b></p>	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> <li>Close spacing and age of downtown structures</li> <li>Increased use of electric heaters and devices</li> <li>Outdated electric wiring and heating systems in older homes/buildings</li> <li>Lack of building codes in smaller jurisdictions</li> <li>Lack of water towers or holding tanks in smaller cities for fire suppression</li> <li><b>Older trees and unkept vegetation in city limits</b></li> <li><b>Growing population</b></li> <li><b>Shrinking volunteerism for fire protection</b></li> </ul>	<p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> <li>Better building standards and maintenance of structures</li> <li>Smoke detectors required by code</li> <li>Well-equipped fire departments with trained volunteers</li> <li>Annual inspections of commercial properties in Valley City</li> <li>National Guard in Valley City</li> </ul>
<p><b>Capability</b></p>	<ul style="list-style-type: none"> <li>See Chapter 7 for a list of capabilities to urban fire/structure collapse.</li> </ul>	



### **Data Limitations**

The NFIRS data does not distinguish between an urban fire and structure collapse. As a result, there is difficulty in determining the true probability and overall impact of structure collapse. Fire department and district boundaries also cross county lines as fire departments/districts from neighboring counties have coverage over parts of Barnes County through mutual aid agreements. As a result, the total number of fires reported may be less than what occurred in the county. Smaller and rural fire departments/districts do not tabulate history independently and therefore, it is difficult to determine impact, frequency, likelihood and overall probability. Also, the lack of a definition of the ‘Other Fires’ category in data from NFIRS limits the understanding of the hazard to develop appropriate mitigation strategies.

### **Other Key Documents**

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following documents.

- 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)
- Barnes County Commercial Animal Feed Operation Ordinance
- Barnes County Comprehensive Plan
- Barnes County Evacuation and Shelter Plan
- Barnes County Local Emergency Operations Plan
- Barnes County Shelter and Mass Care Plan
- Barnes County Threat and Hazard Identification and Risk Assessment (THIRA)
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan, Fire Annex
- North Dakota State Disaster Recovery Plan
- North Dakota State Preparedness Report (SPR)
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)
- Valley City Fire Department Annual and Quarterly Reports

## 4.6.2 Wildland Fire (including Rural)

### History

Statistical information on incidents of wildland fire is provided by the Valley City Fire Department/Valley City Rural Fire Protection District; USDA, Risk Management Agency; the 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP), and Barnes County Emergency Management.

#### Valley City Rural Fire Protection District

- The Valley City Rural Fire Protection District reported six grass fires in 2019 and 10 grass fires in 2020.

#### U.S. Dept. of Agriculture, Risk Management Agency

Crop loss from wildland fire is tracked by the U.S. Dept. of Agriculture, Risk Management Agency (RMA). The RMA provides data on the crop type affected, damage cause description, determined acres and indemnity amount. The damage cause description identifies the cause of damage, determines acres identifies the number of acres lost due to damage, and the indemnity amount identifies the total amount of the loss for the designated peril. **Between January 1, 2001, and December 31, 2020, Barnes County five incidents of crop loss due to wildland fire impacting approximately 342.50 acres of crops totaling \$21,296.00 in losses.**

#### 2018 N.D. Enhanced Mitigation MAOP

A statewide fire emergency declaration and burn ban are issued in response to extremely dry conditions, local/tribal burn bans and fire restrictions declared throughout the state, Fire Weather Watches, and Red Flag Warnings issued by the National Weather Service, unseasonably warm temperatures, low humidity, and high winds. Table 4.6.2.2 shows the history of statewide fire emergency declarations in North Dakota.

The following are key points.

- According to the 2018 N.D. Enhanced Mitigation MAOP, between 1980 and June 26, 2017, the state of North Dakota had declared 17 fire emergencies.
- Crop indemnity amounts from fire between 2003 and 2017 impacted 189 acres of soybeans and totaled \$14,057 in losses.

**There have been no declared disasters or emergencies pertaining to wildland fire in Barnes County.**

**Table 4.6.2.1 – 1980 to June 26, 2017, North Dakota Statewide Fire Emergency Declarations**

Declaration	Location	Date	Magnitude
State EO	North Dakota	1980	State Declared Fire Disaster
State EO	North Dakota	1981	State Declared Fire Disaster
State EO	North Dakota	1988	State Declared Fire Disaster
State EO	North Dakota	1990	State Declared Fire Disaster
State EO	North Dakota	1999	State Declared Fire Disaster
State Request	North Dakota	2000	Governor's Request for USDA assistance for Montana Wildfires
State EO	North Dakota	2000	State Declared Fire Disaster
State EO	North Dakota	2002	State Declared Fire Disaster
State EO	North Dakota	2004	State Declared Drought Disaster/Fire Danger Emergency
State EO	North Dakota	2005	State Declared Fire Disaster
State EO 2005-01	North Dakota	3/10/2005	State declared drought disaster and fire danger emergency
State EO 2006-06	North Dakota	6/28/2006	State declared rural fire emergency potential
State EO 2008-01	North Dakota	4/25/2008	State declared fire emergency
State EO 2012-02	North Dakota	3/30/2012	State declared fire emergency
State EO 2012-09	North Dakota	9/5/2012	State declared fire emergency
State EO	North Dakota	4/1/2015	State declared fire emergency
State EO 2017-07	North Dakota	6/26/2017	Statewide fire and drought emergency

Source(s): 2018 N.D. Enhanced Mitigation MAOP

### Probability

The probability of a hazard or threat is how likely it is it will happen. On average, Valley City Rural Fire Protection District experiences between five and 10 grass fires annually resulting in a 100 percent probability.

#### 2013 West Side Wildfire Risk Assessment (WWA)

The 2013 West Side Wildfire Risk Assessment (WWA) is a wildfire risk assessment and report for 17 western states and is developed by the Oregon Dept. of Forestry. Figure 4.6.1 is the fire risk index based on the WWA. The probability of a wildland fire is highest in and around the city of Valley City and river road from Valley City to Lake Ashtabula.

Profile meeting participants indicated the probability of wildland fire in Barnes County is likely meaning there is a 50 percent chance in the next year of an occurrence of the hazard. The probability of a wildland occurrence can be measured by the presence and extend of the wildland-urban interface. The population living in rural residential areas in Barnes County has increased over the last five years.

#### Wildland-Urban Interface (WUI)

The probability of wildland fire impacting people and property depends on the Wildland-Urban Interface (WUI). WUI is the zone of transition between unoccupied land and human development. Communities that are within 0.5 miles of the zone may also be included. These lands and communities adjacent to and surrounded by wildlands are at risk to wildland fires. There are two types of WUI: intermix and interface.

- **Intermix** refers to areas where housing and vegetation intermingle.
- **Interface** refers to areas with housing near contiguous wildland vegetation.
- **Figures 4.6.1.1 to 4.6.1.14 show the WUI for Barnes County and the cities of Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, and Wimbledon. The areas colored in orange indicate areas where housing and vegetation intermingle.**

### Extent/Magnitude

The extent/magnitude of a hazard or threat is expressed in the amount and/or number of damages or losses either actualized in a community or estimated based on known assets and levels of risk. The extent/magnitude of wildland fire in Barnes County can also be determined by using data provided by the 2018 N.D. Enhanced Mitigation MAOP.

The following are key points:

- Barnes County has \$7,056,000 (2013 dollars) in housing unit values in high and moderate wildfire risk areas.
- According to the 2018 N.D. Enhanced Mitigation Mission Area Operation Plan (MAOP), Barnes County has 124 people and 84 housing units in the High and Moderate Wildland Urban Interface Threat Zones; 83 people and 55 housing units in high-risk areas, and 41 people and 29 housing units in moderate risk areas.
- In terms of extent/magnitude, smaller and less severe fires are more frequent with larger and more severe fires happening sparingly. The probability of wildland fires fluctuates based on season, local weather patterns, traffic conditions, among other variables. The chance of wildland fires increases during summer months when the agriculture sector is in full force and natural vegetation can become dry due to extreme heat.

Profile meeting participants indicated the extent/magnitude or impact of wildland fire as limited meaning noticeable damage to infrastructure, people and/or property in Barnes County.

### Risk Assessment

Table 4.6.2.8 shows the risk assessment as determined by individual jurisdictions, the Steering Committee, and meeting participants at the profile meeting for wildland fire. The risk assessment methodology can be found in the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA). The total in the table represents the sum of each jurisdiction's impact, frequency, likelihood, and vulnerability to a hazard/threat less the jurisdiction's capabilities to respond to the hazard/threat.

Table 4.6.2.9 provides information on the specific impact, frequency, likelihood, vulnerability, and capability of wildland fire in Barnes County. A list of impacts identified as commonplace for natural hazards and man-made threats regardless of the jurisdiction is shown at the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA).

**Table 4.6.2.8 – Barnes County Wildland Fire Risk Assessment Scored Chart Summary**

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	2	3	3	3	1	<b>10</b>
Dazey	4	3	3	4	2	<b>12</b>
Fingal	3	3	3	3	1	<b>11</b>
Kathryn	2	2	2	3	2	<b>7</b>
Leal	4	2	2	3	1	<b>10</b>
Litchville	2	2	2	2	2	<b>6</b>
Nome	3	2	2	2	2	<b>7</b>
Oriska	4	2	2	2	2	<b>8</b>
Pillsbury	2	2	2	4	2	<b>8</b>
Rogers	3	3	4	2	2	<b>10</b>
Sanborn	3	2	3	3	2	<b>9</b>
Sibley	4	2	3	4	1	<b>12</b>
Valley City	4	4	4	3	2	<b>13</b>
Wimbledon	4	3	2	2	2	<b>9</b>

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

### **Vulnerabilities to Publicly-Owned Buildings and Property**

Publicly-owned buildings and property located in the Wildland-Urban Interface (WUI) or in remote areas are vulnerable to wildland fire. The risk of the hazard depends on building and property location, and if emergency services can reach the buildings/property in a timely manner. An inventory of publicly-owned buildings and property is shown in Chapter 3, Profile and Inventory.

The lack of firebreaks around all incorporated cities in Barnes County increases vulnerability to publicly-owned buildings and properties to wildland fire. If a wildland fire were to grow and become uncontrollable, buildings and properties would be at risk from the spread of the fire. Firebreaks can and should be implemented where the WUI poses the greatest threat to people and property. Maps of the WUI shown in this chapter illustrate where measures should be implemented to mitigate wildland fires.

**The WUI Intermix, areas where housing and vegetation intermingle, remained relatively unchanged between 1990 and 2010 consisting of 2.2 and 2.3 percent of the total area of Barnes County.**

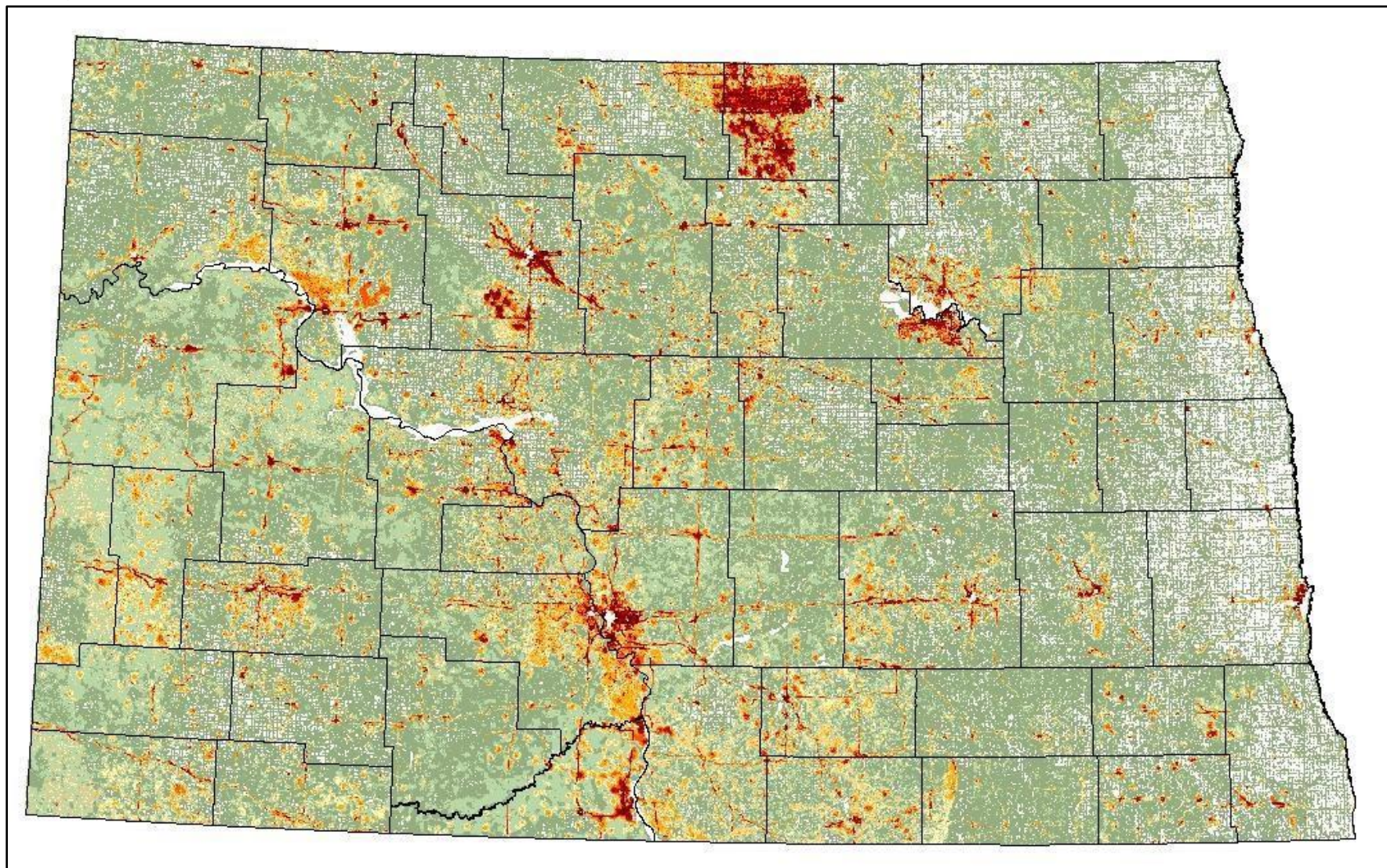
### **Vulnerabilities of Critical Facilities and Infrastructure**

Like publicly-owned buildings and property, critical facilities and infrastructure are vulnerable to wildland fire. The vulnerability will vary depending on location from the wildland-urban interface. If an incident were to occur, depending on the facility or infrastructure impacted, a loss of or delay in emergency or utility services could be the result. Maps of the WUI shown in this chapter illustrate where measures should be implemented to mitigate wildland fires. Interstate 94 through the city of Valley City is critical infrastructure that may be impacted by wildland fire if a fire of significance occurred in that area. Impacts to Interstate 94 may result in regional economic impacts. BNSF and CP Railway infrastructure is also vulnerable to wildland fire based on WUI maps.

**Table 4.6.2.9 – Barnes County Wildland Fire Risk Assessment**

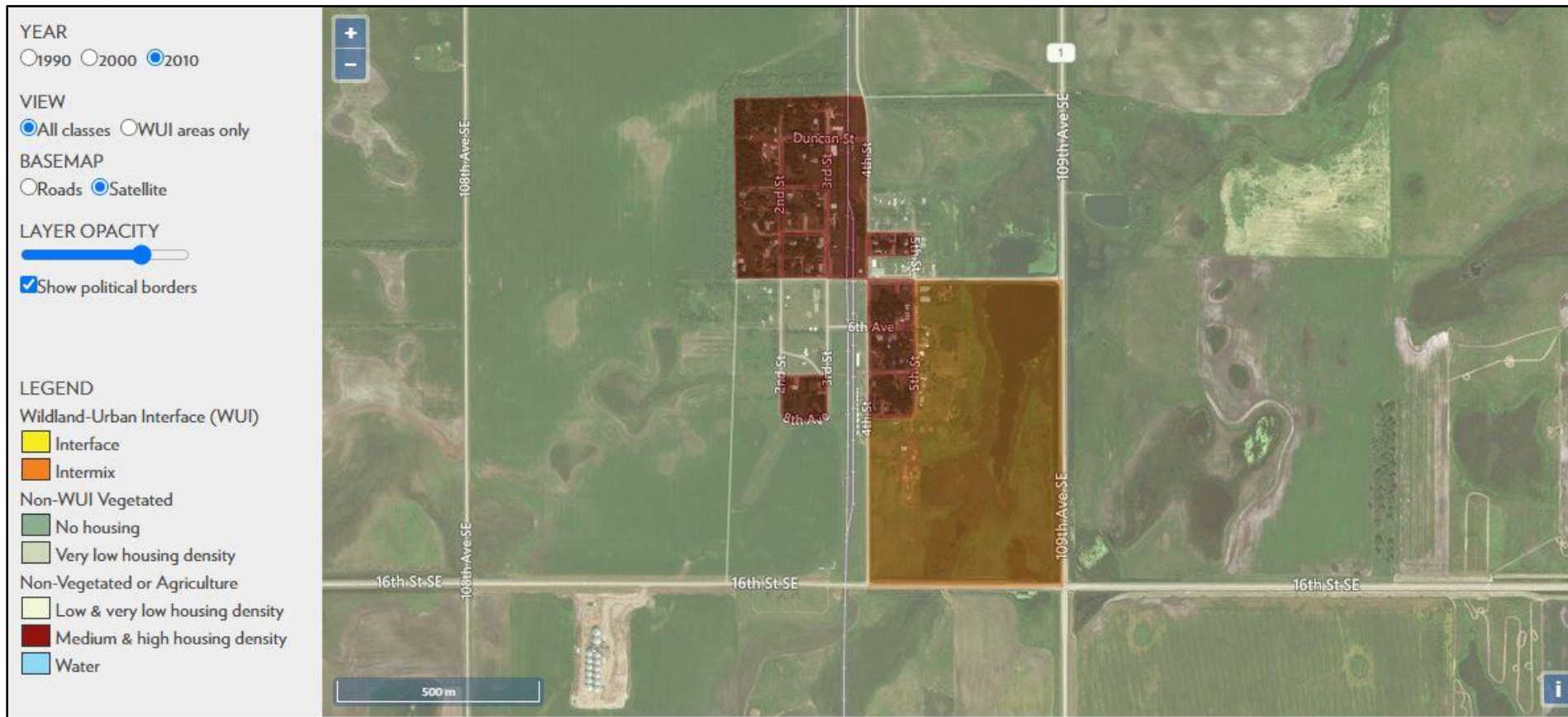
<p><b>Impact</b></p>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Crop Loss</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• Increase Fire Potential</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of Power/Downed Power Lines</li> <li>• Mass Casualties/Fatalities</li> <li>• <b>Property damage on a significant scale if becoming urban and transforming into a large-scale urban fire/structure collapse incident</b></li> <li>• <b>Loss of farm equipment or buildings</b></li> </ul>
<p><b>Frequency</b></p>	<ul style="list-style-type: none"> <li>• 90 percent of wildland fires responded to by local departments originate from hay land or CRP</li> <li>• Controlled burns becoming out of control between 25 and 50 percent of the time</li> </ul>	
<p><b>Likelihood</b></p>	<p><u>More likely</u></p> <ul style="list-style-type: none"> <li>• Agricultural burn-off, sometimes includes garbage and manure</li> <li>• High winds in conjunction with dry conditions</li> <li>• <b>CRP adjacent to structures/city limits</b></li> <li>• <b>Pastureland adjacent to structures/city limits</b></li> <li>• <b>Changing climates and weather patterns</b></li> </ul>	<p><u>Less likely</u></p> <ul style="list-style-type: none"> <li>• Removal of CRP</li> <li>• Summer and winter weather with heavy precipitation</li> </ul>
<p><b>Vulnerability</b></p>	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> <li>• Agricultural burn-off, sometimes includes garbage and manure</li> <li>• High winds in conjunction with dry conditions</li> <li>• <b>CRP adjacent to structures/city limits</b></li> <li>• <b>Pastureland adjacent to structures/city limits</b></li> <li>• Large fire districts – strained coverage/resources</li> <li>• <b>Lack of reliable water sources in rural areas</b></li> <li>• <b>Lack of fire breaks around all incorporated and unincorporated communities</b></li> <li>• <b>Shrinking volunteerism for fire protection</b></li> <li>• <b>Lack of permanent generators at fire halls across the county</b></li> <li>• <b>Lack of fire index signs</b></li> </ul>	<p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> <li>• Removal of CRP</li> <li>• Heavier precipitation than other parts of the state</li> <li>• MOUs with neighboring fire departments</li> <li>• <b>Incorporated jurisdictions with limited wildland-urban interface</b></li> <li>• <b>Investments in equipment for local fire departments</b></li> <li>• <b>The non-Wildland-Urban Interface (WUI), both intermix and interface, consists of 97.8 percent of the total land area of Barnes County.</b></li> </ul>
<p><b>Capability</b></p>	<ul style="list-style-type: none"> <li>• See Chapter 7 for a list of capabilities to wildland fire (including rural).</li> </ul>	

Figure 4.6.2.1 – North Dakota Fire Risk Index Based on 2013 WWA



Source(s): 2018 N.D. Enhanced Mitigation MAOP; 2013 West Wide Wildfire Risk Assessment (WWA)

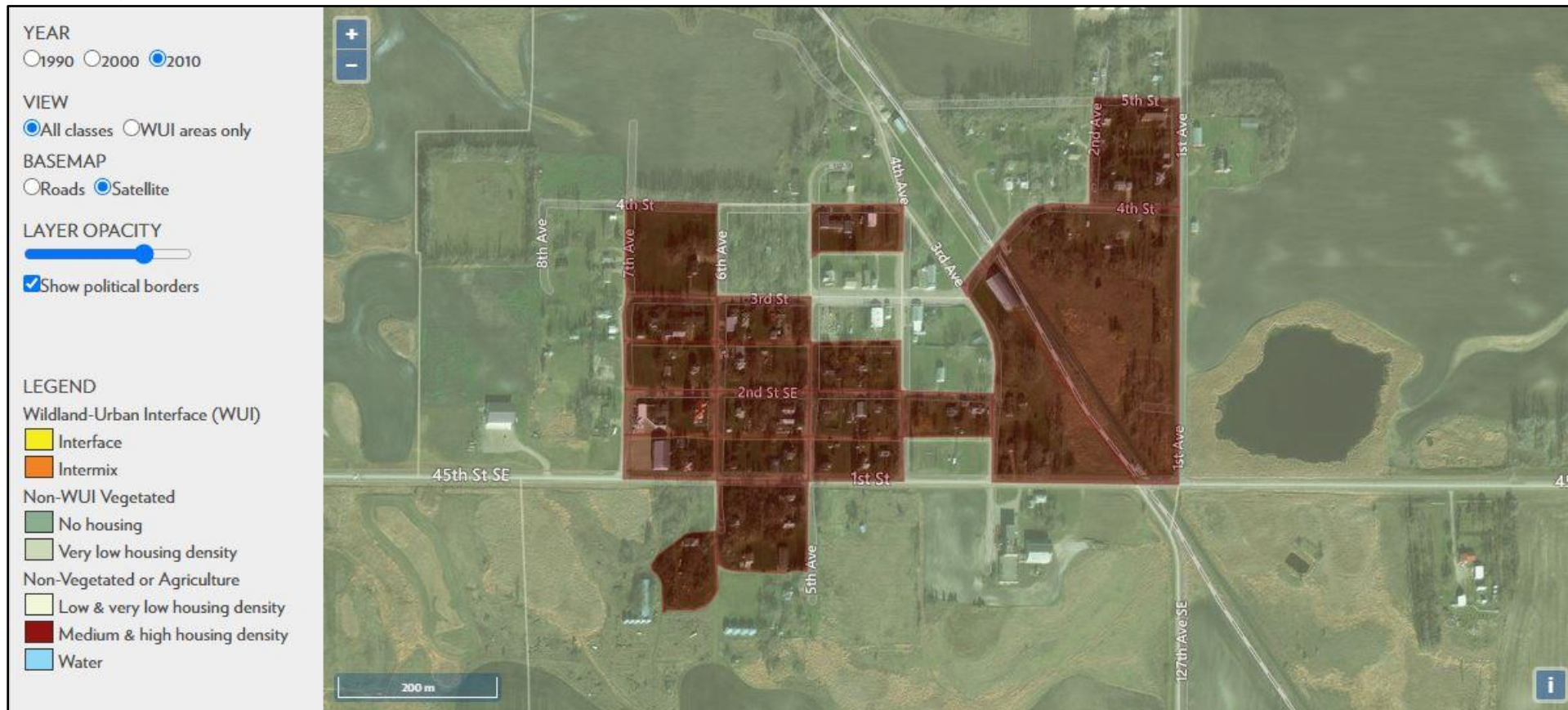
Figure 4.6.2.2 – 2010 City of Dazey Wildland-Urban Interface



Source(s): University of Wisconsin, Silvics Lab – Spatial Analysis for Conservation and Sustainability



Figure 4.6.2.3 – 2010 City of Fingal Wildland-Urban Interface



Source(s): University of Wisconsin, Silvis Lab – Spatial Analysis for Conservation and Sustainability

Figure 4.6.2.4 – 2010 City of Kathryn Wildland-Urban Interface



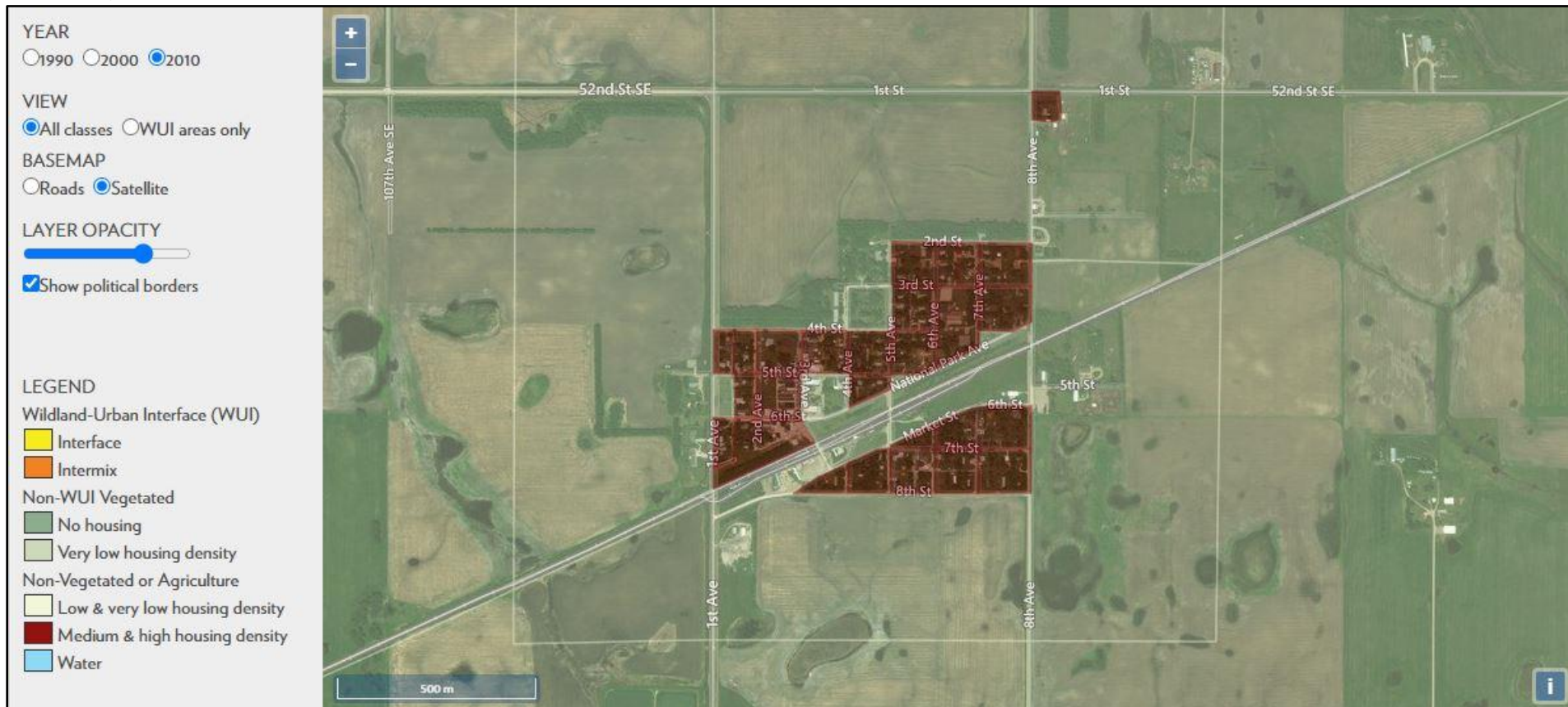
Source(s): University of Wisconsin, Silvics Lab – Spatial Analysis for Conservation and Sustainability

Figure 4.6.2.5 – 2010 City of Leal Wildland-Urban Interface



Source(s): University of Wisconsin, Silvis Lab – Spatial Analysis for Conservation and Sustainability

Figure 4.6.2.6 – 2010 City of Litchville Wildland-Urban Interface



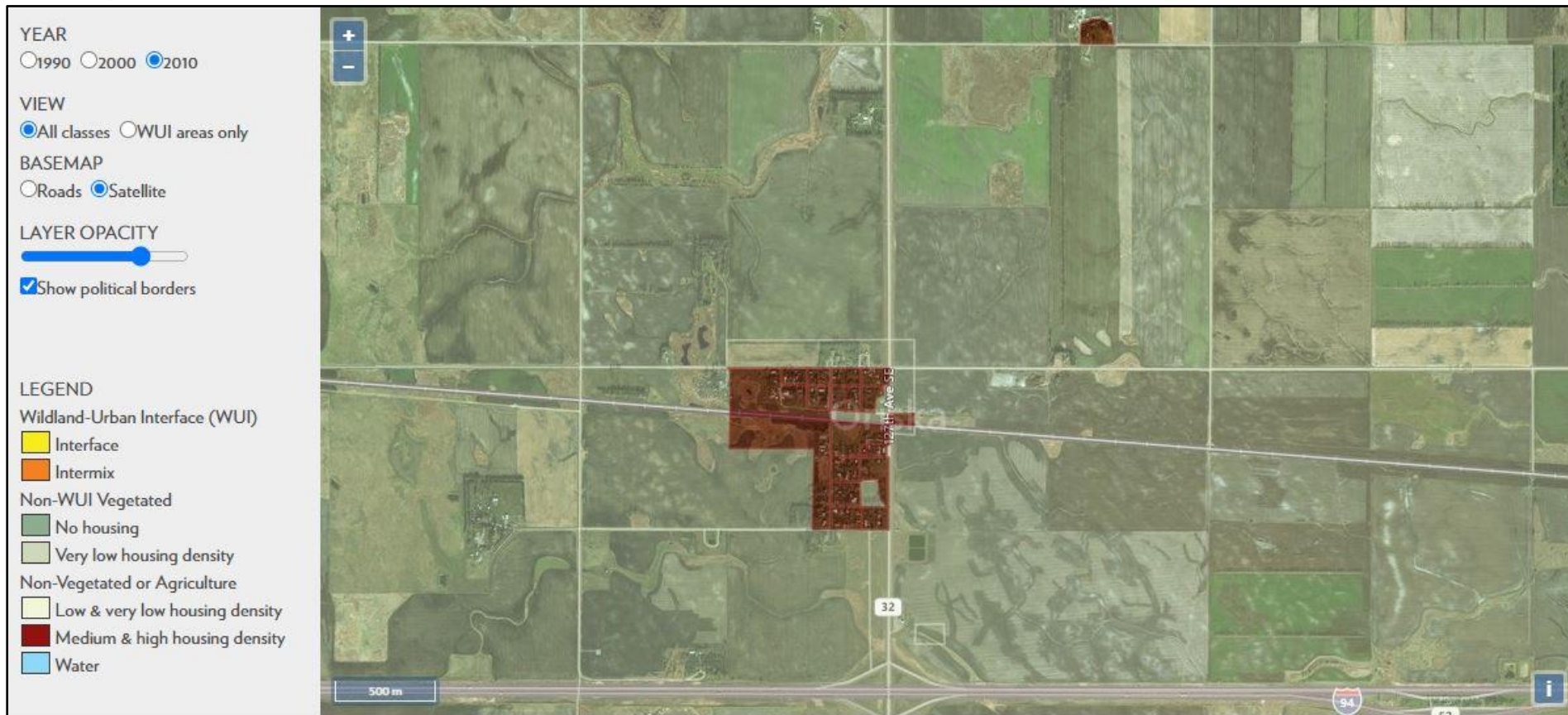
Source(s): University of Wisconsin, Silvics Lab – Spatial Analysis for Conservation and Sustainability

Figure 4.6.2.7 – 2010 City of Nome Wildland-Urban Interface



Source(s): University of Wisconsin, Silvics Lab – Spatial Analysis for Conservation and Sustainability

Figure 4.6.2.8 – 2010 City of Oriska Wildland-Urban Interface



Source(s): University of Wisconsin, Silvis Lab – Spatial Analysis for Conservation and Sustainability

Figure 4.6.2.9 – 2010 City of Pillsbury Wildland-Urban Interface



Source(s): University of Wisconsin, Silvis Lab – Spatial Analysis for Conservation and Sustainability

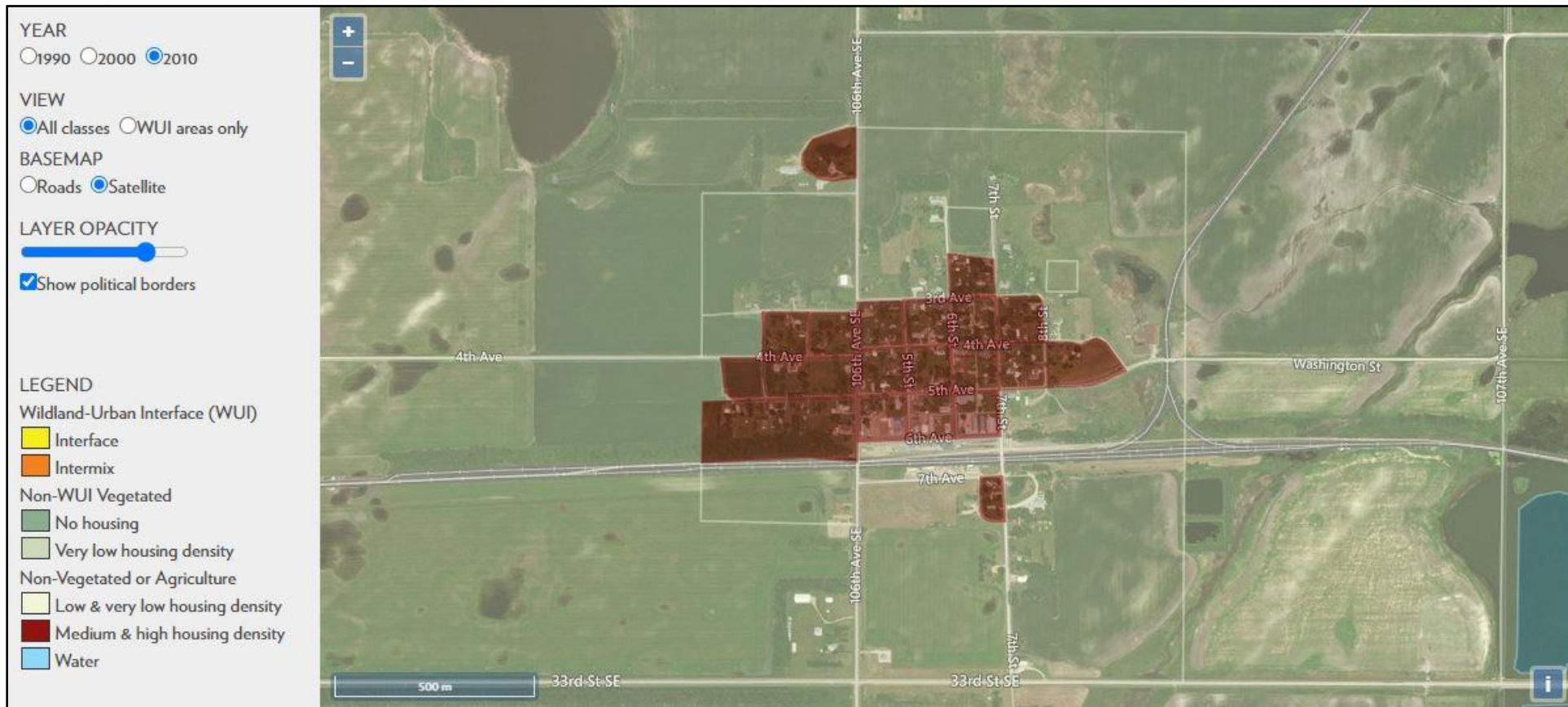
Figure 4.6.2.10 – 2010 City of Rogers Wildland-Urban Interface



Source(s): University of Wisconsin, Silvis Lab – Spatial Analysis for Conservation and Sustainability



Figure 4.6.2.11 – 2010 City of Sanborn Wildland-Urban Interface



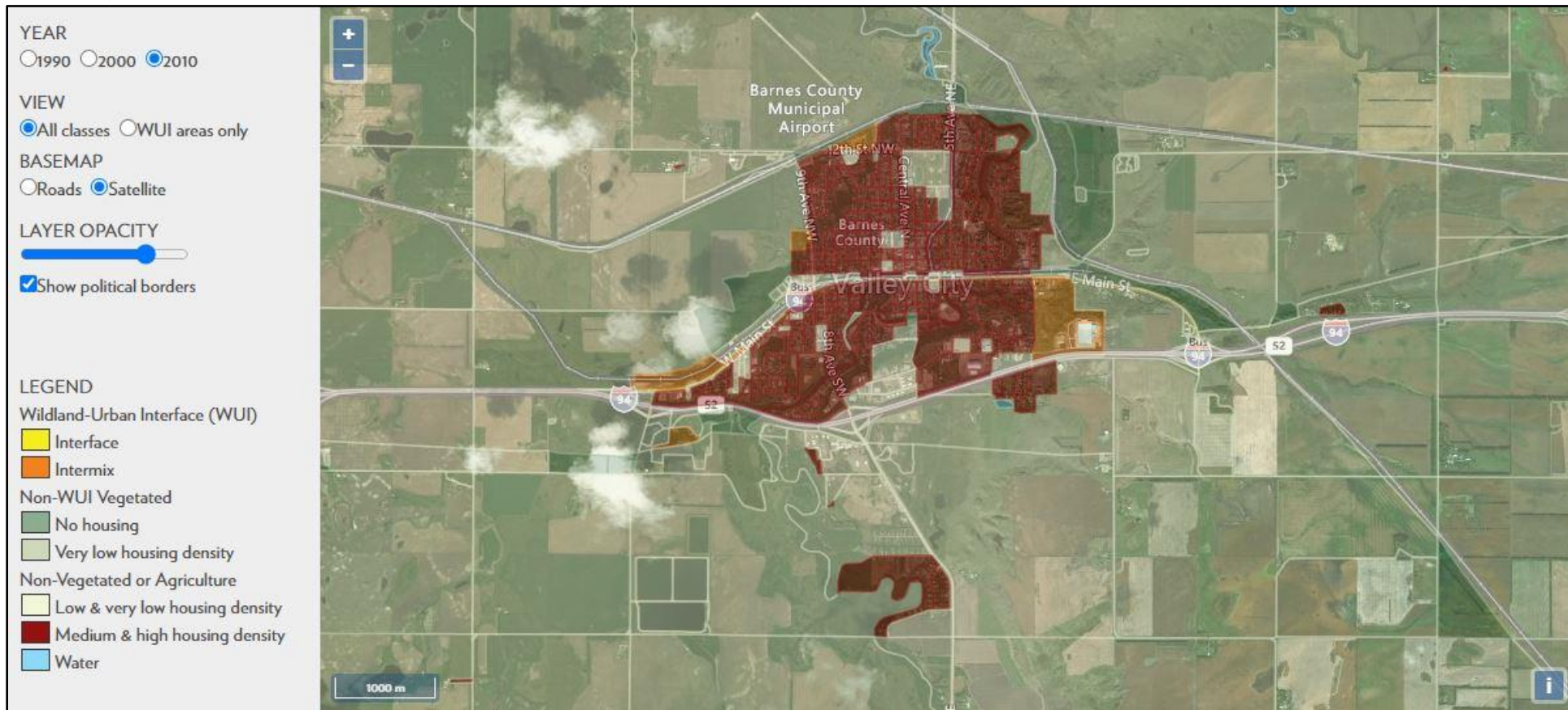
Source(s): University of Wisconsin, Silvis Lab – Spatial Analysis for Conservation and Sustainability

Figure 4.6.2.12 – 2010 City of Sibley Wildland-Urban Interface



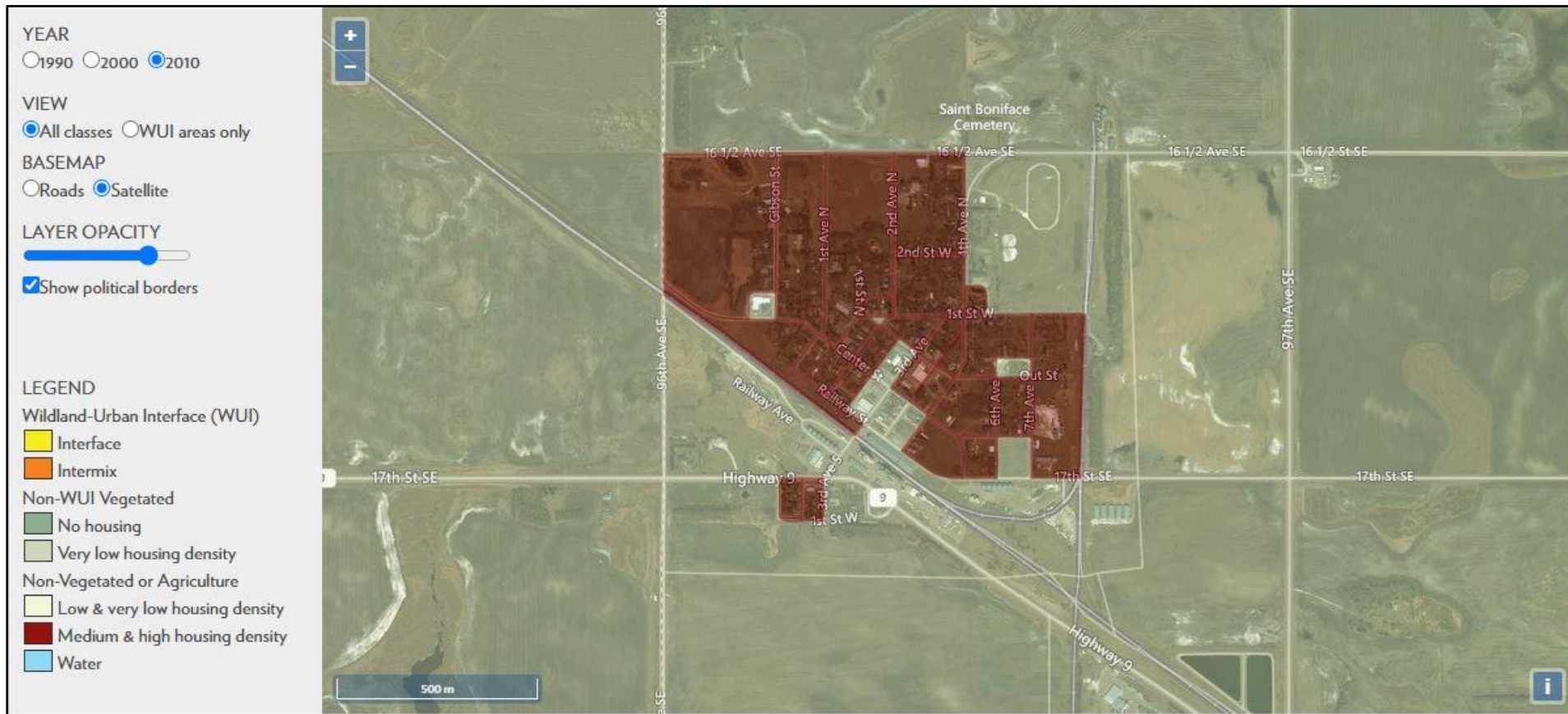
Source(s): University of Wisconsin, Silvics Lab – Spatial Analysis for Conservation and Sustainability

Figure 4.6.2.13 – 2010 City of Valley City Wildland-Urban Interface



Source(s): University of Wisconsin, Silvis Lab – Spatial Analysis for Conservation and Sustainability

Figure 4.6.2.14 – 2010 City of Wimbledon Wildland-Urban Interface



Source(s): University of Wisconsin, Silvis Lab – Spatial Analysis for Conservation and Sustainability

### Vulnerabilities to New and Future Development

Rural homesteads on large parcels of land in remote areas are a trend in residential development in areas of North Dakota surrounding larger cities like Valley City. Barnes County should strengthen planning and zoning regulations limiting where new residential development can occur, specifically large rural lots. The vulnerability of new and future development to wildland fire also increases as the distance from fire departments and emergency services increases. Residential development in remote areas increases the opportunity for human-induced wildland fires. **The non-Wildland-Urban Interface (WUI), both intermix and interface, consists of 97.8 percent of the total land area of Barnes County.** Proposed industrial development in unincorporated Spiritwood, N.D. in neighboring Stutsman County may increase risk to the hazard over the next five years.

### Data Limitations

Barnes County fire department and district boundaries cross county lines, and therefore, provide coverage in neighboring counties. This cross-over may provide challenges to data tracking purposes.

The history data provided by the National Association of State Foresters did not indicate the county where the fire occurred which results in unusable data.

In addition to unavailable hazard data at the local level, wildland fire data was not available after 2008 from the NDSU-N.D. Forest Service. The NDSU-N.D. Forest Service reported that due to database system errors, the history of wildland fires in North Dakota was lost. Information from NFIRS does not distinguish which fires were wildland in nature. Information from the National Fire and Aviation Management did not provide crop or property loss, cause of the fire or the responding fire departments/districts but did include the final fire acre quantity and latitude and longitude coordinates.

### Other Key Documents

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following documents.

- 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)
- Barnes County Comprehensive Plan
- Barnes County Evacuation and Shelter Plan
- Barnes County Local Emergency Operations Plan
- Barnes County Shelter and Mass Care Plan
- Barnes County Threat and Hazard Identification and Risk Assessment (THIRA)
- Fire Management Plans for federal lands
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan, Fire Annex
- North Dakota Forest Service, Building Sustainable Communities Through Forestry
- North Dakota State Disaster Recovery Plan
- North Dakota State Preparedness Report (SPR)
- North Dakota Statewide Assessment of Forest Resources and Forest Resource Strategy
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

## 4.7 Flood

Including closed basin, flash floods, groundwater saturation and seepage, ice jams, levee/floodwall failure, overland flooding, and river flooding.

### Characteristics

Flooding, as a natural hazard, has been a part of the county's conflict with nature throughout history and is defined as an overflow of water on land not normally covered by water. Floods are a natural phenomenon; however, flood hazards are often both intensified and mitigated by man-made interference with nature.

<b>Seasonal Pattern</b>	More frequent during spring and summer. Fall flooding occurs on very rare occasions. Spring and winter flooding can occur from ice jams in culverts and local bodies of water.
<b>Duration</b>	Several hours for flash flooding; up to 2 weeks or several months depending on severity for major overland and/or riverine flooding.
<b>Speed of Onset</b>	Minutes for flash flooding. Between 12 and 24 hours warning for closed basin, overland, and riverine flooding. Prolonged warning for potential risk to riverine flooding due to Baldhill Dam. Onset can be reduced and/or eliminated entirely due to dam infrastructure.
<b>Location</b>	<p><u>Barnes County.</u> Sheyenne River Valley. Low-lying areas near or adjacent to bodies of water, or with inadequate drainage. Closed basins.</p> <p>Meadow Lake Township near the city of Litchville, Minnie Lake Township in northeast Barnes County, and Laketown Township and Edna Township near the city of Dazey experience consistent impacts to roadways from flooding events.</p> <p>Township maps depicting the damages sites from Presidential Disaster Declaration DR-4553 are available on a disc located at the beginning of this chapter.</p> <p><u>Incorporated Jurisdictions.</u> See Chapter 8, Jurisdictions.</p>

For more information regarding flooding please reference the **2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)**. The state plan can be accessed by following the electronic hyperlink or link to the N.D. Dept. of Emergency Services website:

[2018 North Dakota Enhanced Mitigation Mission Area Operations Plan](https://www.des.nd.gov/planning)

<https://www.des.nd.gov/planning>

### History

Information on the history of flooding in Barnes County was obtained from the Federal Emergency Management Agency (FEMA); National Climatic Data Center (NCDC); National Oceanic and Atmospheric Administration (NOAA); Barnes County Auditor's Office; Barnes County Office of Emergency Management; U.S. Army Corps. of Engineers (USACE); U.S. Dept. of Agriculture, Risk

Management Agency (RMA); and the 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP).

Federal Emergency Management Agency

- Since 1953, Barnes County has had 30 Presidential Disaster Declarations, of which 18 were for flooding. Flooding accounts for or is a factor in approximately 67 percent of disasters declared in Barnes County.

National Climatic Data Center/National Oceanic and Atmospheric Administration

Table 4.7.1 summarizes the history of flooding in Barnes County between January 1, 1996, and December 31, 2020. Data was not available between January 1, 1950, to December 31, 1995, as only occurrences of tornado, thunderstorm wind and hail were recorded. Starting January 1, 1996, all event types (48) are recorded. This data does not include recent instances of flooding, which were included in presidential disaster declarations in 2019 and 2020. A detailed hazard history for Barnes County can be found on a disc located at the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment.

The following are key points.

- Barnes County experienced 30 occurrences of flooding resulting in approximately one incident of significance annually.
- Approximately \$1,510,000.00 in property damage and \$3,115,000.00 in crop damage was reported.
- Three injuries and no fatalities were reported.

**Table 4.7.1 – 1996 to 2020 Barnes County Flood Hazard History Summary**

Flood				
Occurrences	Fatalities	Injuries	Property Damage	Crop Damage
30	0	3	\$1,510,000.00	\$3,115,000.00

Source(s): National Climatic Data Center (NCDC), National Oceanic and Atmospheric Administration (NOAA)

Barnes County Auditor’s Office and Barnes County Emergency Management

Table 4.7.2 illustrates public infrastructure damage information from presidential disaster declarations from flooding in Barnes County between 2009 and 2020. The following are key points.

- **DR-1829.** A total of 1,713 damaged sites were identified from the 2009 flood declaration totaling \$4,500,403.88. The cost share was approximately 8.9 percent local, 10.7 percent state, and 80.4 percent federal. The average cost per damaged site was \$2,627.21.
- **DR-1907.** A total of 523 damaged sites were identified from the 2010 flood declaration totaling \$831,160.87. The cost share was approximately 15.0 percent local, 10.0 percent state, and 75.0 percent federal. The average cost per damaged site was \$1,589.22.

- **DR-1981.** A total of 1,981 damaged sites were identified from the 2011 flood declaration totaling \$2,817,614.68. The cost share was approximately 19.3 percent local, 9.5 percent state, and 71.2 percent federal. The average cost per damaged site was \$1,422.32.
- **DR-4475.** A total of 82 damaged sites were identified from the 2019 flood declaration totaling \$200,167.79. The cost share was approximately 14.4 percent local, 9.6 percent state, and 76.0 percent federal. The average cost per damaged site was \$2,411.07.
- **DR-4444.** A total of 260 damaged sites were identified from the 2019 flood declaration totaling \$285,074.69. The cost share was approximately 14.3 percent local, 9.5 percent state, and 76.2 percent federal. The average cost per damaged site was \$1,096.44.
- **DR-4553.** A total of 115 damaged sites were identified from the 2020 flood declaration totaling \$1,089,296.78. The cost share was approximately 11.7 percent local, 7.8 percent state, and 80.5 percent federal. The average cost per damaged site was \$9,472.15.

**Table 4.7.2 2009 to 2020 Public Infrastructure Damages from Flooding**

Disaster No.	Year	Damaged Sites	Local Share	State Share	Federal Share	Grade Raises
DR-4553	2020	115	\$127,459.65	\$84,973.12	\$876,864.01	0
DR-4444	2019	260	\$40,724.95	\$27,149.97	\$217,199.77	0
DR-4475	2019	82	\$28,805.83	\$19,137.25	\$152,224.71	0
DR-1981	2011	1,981	\$542,503.27	\$267,660.16	\$2,007,451.25	7
DR-1907	2010	523	\$124,674.13	\$83,116.08	\$623,370.66	7
DR-1829	2009	1,713	\$401,490.25	\$482,225.13	\$3,616,688.50	31

Source(s): Barnes County Auditor’s Office; Barnes County Emergency Management

U.S. Dept. of Agriculture, Risk Management Agency

Crop loss from flood is tracked by the U.S. Dept. of Agriculture, Risk Management Agency (RMA). The RMA provides data on the crop type affected, damage cause description, determined acres and indemnity amount. The damage cause description identifies the cause of damage, determines acres identifies the number of acres lost due to damage, and the indemnity amount identifies the total amount of the loss for the designated peril. **Between January 1, 2001, and December 31, 2020, Barnes County experienced eight incidents of crop loss due to flooding impacting approximately 456.30 acres of crops totaling \$47,779.20 in losses.**

2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)

According to the 2018 N.D. Enhanced Mitigation MAOP, the following historical flooding events have occurred in and impacted Barnes County.

- **2011 Floods.** The 2011 flood impacted every river basin in North Dakota, shattered 21 peak records, displaced residents in 28 neighborhoods, and swamped 4,100 homes and businesses alone in Minot. The final cost is not yet fully known. But it is estimated the final cost will easily exceed \$1.4 billion. With above normal precipitation and saturated soil conditions experienced during late summer and fall of 2010, the stage was set for a large scale 2011 spring flood. Flood preparedness efforts began in the fall of 2010 based on early flood predictions by the National



Weather Service, USGS, and NDDWR. On February 14, 2011, the State Emergency Operations Center (SEOC) received its first report of flooding in the City of Belcourt. This was followed by extensive flooding along the Mouse River, which was particularly devastating to the city of Minot by flooding an estimated 4,700 structures and damaging infrastructure resulting in the loss of potable water. The Missouri River basin flooded as well, with flood records shattered along the River in its entirety affecting every area along the river's path such as Williston, Bismarck/Mandan, Lake Oahe and surrounding communities in the Standing Rock Reservation. The spring melt of a heavy snowpack produced significant flooding and runoff into the Jamestown and Pipestem dams. The latter half of June and all through the month of July saw persistent heavy rains in the upper James River basin which kept summertime runoff high enough to prevent the Jamestown and Pipestem Dams from lowering through normal means such as evaporation. The last weekend in July produced one of the heaviest precipitation events with well over four inches of rain covering a wide area that drained into the two reservoirs, and this last storm in July sent both Jamestown and Pipestem dams uncomfortably close to their emergency spillways and prompted the USACE to plan for unprecedented high releases out of both dams well into October and early November. **In the Sheyenne River Valley, the high amount of runoff entering Baldhill Dam also initiated high releases which caused the Sheyenne River to reach its second highest crest on record in Valley City. The Baldhill Dam releases created such a swift rising of the Sheyenne that every available resource needed to be used to quickly place dikes, Hesco barriers, and sandbags to prevent the Sheyenne from flooding most of the city. Valley City was threatened again in August due to heavy local rains in the middle-Sheyenne basin.** But due to the quick response by state agencies and the assistance of the USACE and North Dakota National Guard, the city was protected from becoming another disaster such as Minot. The Red River Valley began its flooding on March 22, with Fargo reaching flood stage on March 29. Due to a rather wet summer, Fargo experienced 150 days above flood stage this spring and finally dropped below flood stage on August 27.

- **According to the National Centers for Environmental Information, as of 2018, Barnes County has experienced 16 flash flood events resulting in \$485,000 in property damage and \$170,000 in crop damage, and 14 flood events resulting in \$1,025,000 in property damage, \$2,945,000 crop damage, and three injuries.**

### Probability

The probability of a hazard or threat is how likely it is it will happen. Per Table 4.7.1, the following statistics on the probability of flooding in Barnes County is as follows:

- Probability of flooding in Barnes County is approximately 100 percent based on 30 flood occurrences between January 1, 1996, and December 31, 2020, resulting in approximately one incident of significance annually.
- Barnes County experiences approximately \$60,400.00 in property damage and \$124,600.00 in crop damage annually between January 1, 1996, and December 31, 2020.
- Approximately three injuries and no fatalities reported between January 1, 1996, and December 31, 2020.

According to information obtained from the U.S. Dept. of Agriculture, Risk Management Agency (RMA), crop loss due to severe summer weather impacted approximately 22.82 acres totaling \$2,388.96 in losses annually in Barnes County.

Profile meeting participants and the Steering Committee indicated the probability of a flood in Barnes County as likely meaning that there is between a 10 and 100 percent probability in the next year of an incident.

**Figure. 4.7.1 is from the 2018 N.D. Enhanced Mitigation MAOP and shows the one-percent annual chance floodplain in North Dakota based on FEMA's NFHL, which only shows areas with DFIRM data available.** The one-percent annual chance floodplain is present along the Sheyenne River Valley in Barnes County.

### **Extent/Magnitude**

The extent/magnitude of a hazard or threat is expressed in the number of damages or losses either actualized in a community or estimated based on known assets and levels of risk. Based on history of flooding in Tables 4.7.1 and 4.7.2, and crop loss information from the USDA,RMA, the following extent/magnitude of flooding in Barnes County is determined.

- Per Table 4.7.1, approximately an injury from flooding occurs once every eight years. Annual property damage and crop losses total \$60,400.00 and \$124,600.00, respectively.
- Per Table 4.7.2, the largest flooding event in terms of monetary damage was DR-1829 with 4,500,403.88 in damages. The largest flooding event in terms of damaged sites was DR-1981 with 1,981 damaged sites. The largest flooding event in terms of cost per damaged site was DR-4553 with \$9,472.15 per site.
- Crop loss data from the USDA, RMA shows minimal crop loss due to flooding.

Profile meeting participants and the Steering Committee indicated the extent/magnitude of a flood in Barnes County as catastrophic meaning that more than 50 percent of the jurisdiction, its people and property can be impacted.

### **National Flood Insurance Program (NFIP)**

The National Flood Insurance Program (NFIP), managed by the Federal Emergency Management Agency (FEMA), enables homeowners, business owners, and renters in participating communities to purchase federally backed flood insurance. The NFIP provides affordable insurance to property owners and encourages communities to adopt and enforce floodplain management regulations. This insurance offers an insurance alternative to disaster assistance to meet the escalating costs of repairing flood damage to buildings and their contents.

Participating communities agree to adopt and enforce floodplain management ordinances to reduce future flood damage. There are now more than 20,600 participating communities across the United States and its territories.

Federal flood insurance is available for residents and business owners in both high-risk and moderate-to-low risk areas. The insurance is required for buildings in high-risk areas that have loans from federally regulated or insured lenders. This requirement extends to disaster assistance loans from the Small Business Administration. However, it is not a requirement of the NFIP to have a mortgage or SBA loan or live in a high-risk area to obtain flood insurance. It is available community-wide, with premiums that vary according to the level of risk.

Table 4.7.3 shows the communities participating in the National Flood Insurance Program. Communities that participate in the National Flood Insurance Program (NFIP) are required to adopt flood plain regulations that meet NFIP objectives:

- New buildings must be protected from flooding damages because of a 1-percent chance flood.
- New development must not cause an increase in flood damages to other property.
- The DFIRMs for Barnes County can be found on a disc located at the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment.
- A map of the watersheds of Barnes County is shown in Chapter 9, Maps.
- Chapter 6, Mitigation Strategy includes mitigation projects to enroll jurisdictions and encourage participation in the National Flood Insurance Program (NFIP). Mitigation Project PR-3 encourages enrollment and participation in the NFIP. Mitigation Project PR-4 encourages review of local ordinances to meet or exceed minimum federal and state requirements, comply with NFIP, and enroll in the Community Rating System.

**Table 4.7.3 – Participation in National Flood Insurance Program (NFIP) – Barnes County**

Jurisdiction Name	CID #	Initial FHBM Identified	Initial FIRM Identified	Mapped
Barnes, County of	380339	--	06/07/87	02/06/08
Kathryn, City of	380001	11/22/74	07/19/82	02/06/08
Litchville, City of	380187	01/17/75	11/20/79	02/06/08(M)
Valley City, City of	380002	02/08/74	09/28/84	02/06/08
Wimbledon, City of	380212	02/14/75	02/20/08	(NSFHA)

Source: FEMA Community Status Book Report, North Dakota

**NFIP Program Policies, Claims and Loss Payments**

According to the N.D. Dept. of Water Resources, as of September 30, 2021, there are 147 NFIP policies in Barnes County covering \$26,192,000.00 in property and assets. Of the NFIP policies, 107 are in the A-Zone. The average cost to consumer per policy is \$1,372.23. The number of claims made since 1978 in Barnes County is 392 with \$2,686,849.00 paid on those claims.

**NFIP Repetitive Loss Properties**

Per FEMA, a repetitive loss (RL) property is any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year

period, since 1978. The losses must be within 10 years of each other and be at least 10 days apart. A RL property may or may not be currently insured by the NFIP.

As September 20, 2021, there are 21 repetitive loss properties were in Barnes County – 19 residential properties and one non-residential property in the city of Valley City, and one residential property in the city of Kathryn. According to the N.D. Dept. of Emergency Services, a total of seven repetitive loss properties have been mitigated.

### **NFIP Severe Repetitive Loss Properties**

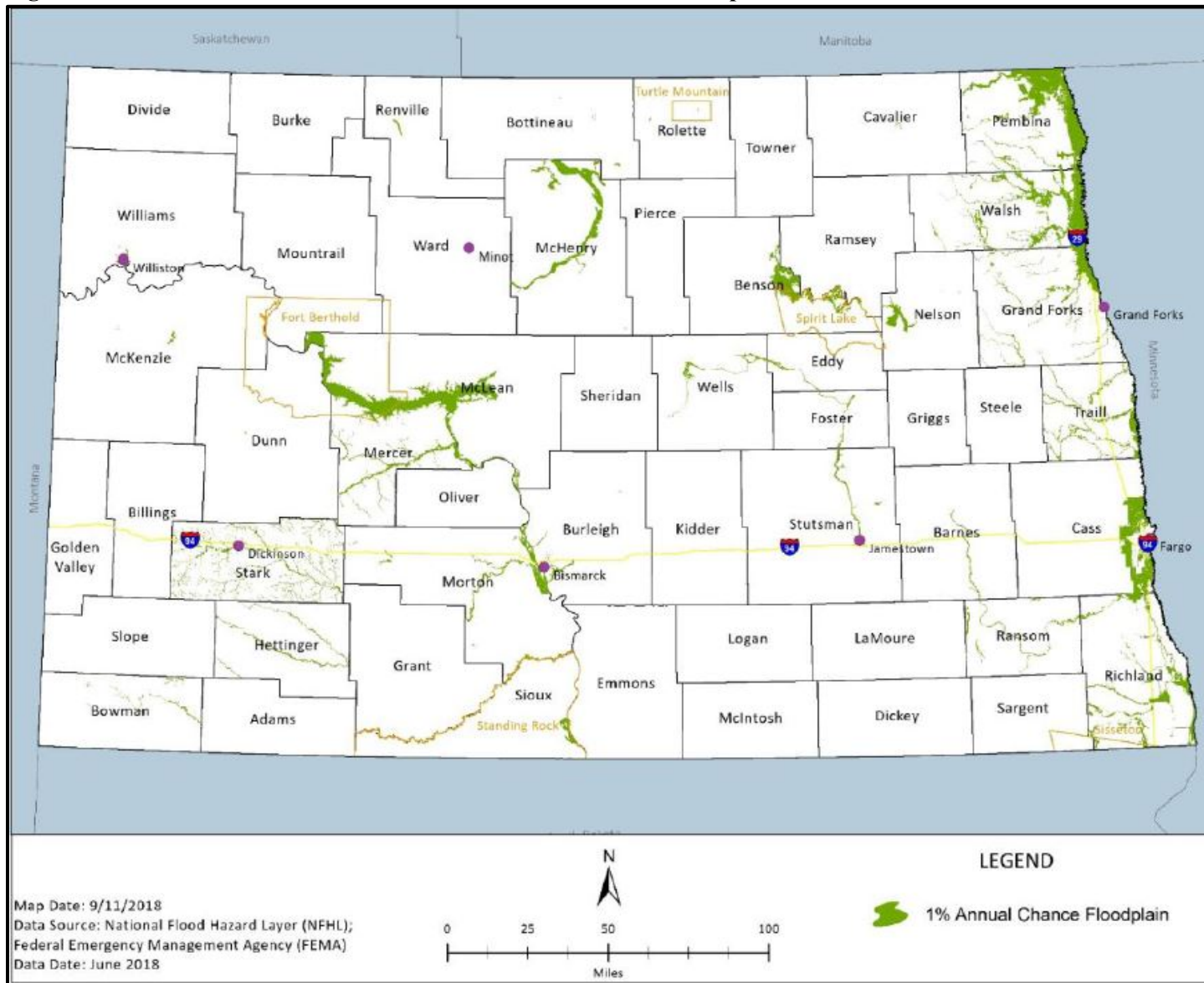
A Severe Repetitive Loss (SRL) property is a residential property that has had at least four NFIP claim payments over \$5,000 each with two such claims occurring within any ten-year period, or residential property that has had at least two separate claim payments within any ten-year period that have cumulatively exceeded the value of the property. As September 20, 2021, there are no severe repetitive loss properties were in Barnes County.

### U.S. Army Corps. of Engineers (USACE)

The following information was provided by the USACE, St. Paul District highlighting overall statistics from the 2019-2020 flooding event.

- **Fall 2019**
  - Maximum release of 3,400 cfs were reached on October 22. Release over 3,000 cfs was held from October 17 through October 27.
  - Peak inflow from fall events: average daily inflow of 4,500 cfs on October 21.
  - Elevation peaked October 29 at 1268.0 ft NGVD 29
  - Winter releases of 800 cfs were held from Nov 15- Dec 8 and then reduced roughly 400 cfs for the remainder of the winter.
  - Reached its target elevation (1262.9 ft) on Dec 31, 2019.
  
- **Spring 2020**
  - Pool was lowered to 1256.9 ft NGVD29 on March 18
  - Spring inflow was a double peaked inflow event of roughly 4,600 cfs separated by 5 days (April 2 and April 7)
  - Peak outflow of 2,900 cfs on April 8
  - Peak Elevation of 1266.0 ft NGVD29 on April 20

Figure 4.7.6 – 2019 North Dakota One-Percent Annual Chance Floodplain



**Risk Assessment**

Table 4.7.3 shows the risk assessment as determined by individual jurisdictions, the Steering Committee, and meeting participants at the profile meeting for flood. The risk assessment methodology can be found in the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA). The total in Table 4.7.3 represents the sum of each jurisdiction’s impact, frequency, likelihood and vulnerability to a hazard/threat less the jurisdiction’s capabilities to respond to the hazard/threat.

**Table 4.7.3 – Barnes County Flood Risk Assessment Scored Chart Summary**

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	4	3	3	4	2	12
Dazey	4	2	2	3	2	9
Fingal	3	3	3	4	1	12
Kathryn	3	2	3	3	2	9
Leal	4	2	3	3	2	10
Litchville	2	2	2	2	2	6
Nome	3	2	3	3	1	10
Oriska	3	3	4	4	2	12
Pillsbury	3	3	3	2	2	9
Rogers	3	3	4	3	1	12
Sanborn	4	3	3	2	1	11
Sibley	4	3	4	4	1	14
Valley City	2	3	3	2	4	6
Wimbledon	2	3	3	2	2	8

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 4.7.4 provides information on the specific impact, frequency, likelihood, vulnerability and capability of flood in Barnes County. A list of impacts identified as commonplace for natural hazards and man-made threats regardless of the jurisdiction is shown in Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA).

**Table 4.7.4 – Barnes County Flood Risk Assessment**

<p><b>Impact</b></p>	<ul style="list-style-type: none"> <li>• Roads can become washed out and limit access for emergency services and economy activity</li> <li>• Loss of economy resulting from crop damage</li> <li>• Increased mosquitos-may transmit disease due to lots of grass and debris laying around</li> <li>• Large property loss, vehicles, personal property</li> <li>• Can impact lift stations and cause sewer backups contributing to infectious disease</li> <li>• Power outages, sometimes prolonged</li> <li>• Damage to critical facilities and infrastructure</li> <li>• Potential loss of life from fast moving water</li> <li>• Homes with basements can become flooded from ground saturation/seepage</li> <li>• Temporary displaced population</li> <li>• Temporary relocation of medical services would decrease range of services offered</li> </ul>	<ul style="list-style-type: none"> <li>• Increased crime as emergency services are limited in access and mobility</li> <li>• Increase in infectious disease from overland flooding and standing water (mold and blue/green algae)</li> <li>• Cause of secondary hazards such as shortage or outage of critical materials or infrastructure, or transportation incidents</li> <li>• Increase in traveling distances for residents commuting to work, school buses, emergency response vehicles, general economic activity, and agriculture-related activity due to blocked roads from flooding</li> <li>• <b>Potential permanent closure of township roads</b></li> <li>• Compromise/diminished water quality from agricultural runoff carried by flood waters</li> <li>• <b>NFIP paid \$2,686,849.00 in losses since 1978 in Barnes County</b></li> <li>• <b>Between January 1, 2001, and December 31, 2020, Barnes County experienced eight incidents of crop loss due to flooding impacting approximately 456.30 acres of crops totaling \$47,779.20 in losses.</b></li> <li>• <b>2009 and 2011 Flood Costs were \$16 million state and federal share, and \$3 million local share</b></li> <li>• <b>Over 350,000 sandbags were placed in 2009.</b></li> </ul>
<p><b>Frequency</b></p>	<ul style="list-style-type: none"> <li>• Annual occurrences of localized flooding of streets in incorporated cities and county roads and bridges</li> <li>• Periodic flash flooding from heavy rains during the summer</li> <li>• Overland flooding from increased heavy rains in the summer and snow melt in the spring occurring each year to varying degrees of severity</li> <li>• Increasing irregularity in precipitation patterns</li> <li>• Agricultural land management practices to maximize production can impact the severity flooding</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Presidential Disaster Declarations in Barnes County in 2009, 2010, 2011, 2019 (two declarations), and 2020.</b></li> </ul>

**Table 4.7.4 – Barnes County Flood Risk Assessment – Continued**

<b>Likelihood</b>	<p><u>More likely</u></p> <ul style="list-style-type: none"> <li>• <b>Presence of the Sheyenne River</b></li> <li>• Rapid change of seasons resulting in excessive snow melt and drainage</li> <li>• Low spots on county/township roads, and county and state highways</li> <li>• Closed basins increased likelihood of flooding due to being at capacity and not allowing new precipitation to drain</li> <li>• Controlled and uncontrolled releases from Baldhill Dam</li> <li>• Overland flooding likely due to lack of storm water systems in smaller incorporated cities and rural areas</li> <li>• High water table</li> <li>• Increased impervious surface and pavement increases runoff and decreases water absorbed naturally</li> <li>• Changing weather patterns with increased rain intensity and irregular occurrences</li> <li>• Farm and field drain tile and dewatering systems</li> </ul>	<p><u>Less likely</u></p> <ul style="list-style-type: none"> <li>• Likelihood dependent local weather climate patterns</li> <li>• Structure-specific drain tile and dewatering systems</li> <li>• Presence of Baldhill Dam allows for controlled drainage of flood waters</li> <li>• Valley City Permanent Flood Protection Project</li> <li>• Farm and field drain tile and dewatering systems</li> </ul>
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Table 4.7.4 – Barnes County Flood Risk Assessment - Continued

<b>Vulnerability</b>	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> <li>• Presence of Sheyenne River which drains water from a geographic area larger than Barnes County</li> <li>• Lack of storm water system in smaller jurisdictions and rural areas</li> <li>• Levees in Valley City could become overwhelmed from flooding and break</li> <li>• High elderly and vulnerable populations – See Chapter 3, Profile and Inventory</li> <li>• Smaller jurisdictions and rural areas with agriculture based economic are vulnerable to crop and livestock losses from flooding impacts</li> <li>• Low-lying roads in rural areas of the county and townships</li> <li>• Multiple severe weather systems occurring close together further inundating existing flooding impacts</li> <li>• <b>In 2009, 8<sup>th</sup> avenue bridge was the only bridge open in Valley City during the flood</b></li> <li>• <b>The 4<sup>th</sup> St. Bridge (both east and west), Rainbow Bridge, Mill Dam, Little Dam, Viking Drive, and Hospital Bridges will be closed during flooding events to complete the efficacy of the Valley City Permanent Flood Protection Project. This will result in the 8<sup>th</sup> Avenue Bridge and North Valley Bridge being the only bridges open during flood events.</b></li> <li>• Limited local financial resources to accomplish projects independently during Presidential Disaster Declarations</li> </ul>	<p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> <li>• <b>LiDAR and constant improvements in technology is available for flood mapping. The DWR is currently updating all DFIRMS through a FEMA grant.</b></li> <li>• Advanced warning systems such a Everbridge, cell phones, internet, and TV for flash flooding events</li> <li>• Road raises have been completed and properties have been removed from flood prone areas – ongoing based on current conditions and impacts</li> <li>• <b>Extensive retrofitting of bridges, culverts, and road grades by Barnes County Highway Department – See Table 4.7.5</b></li> <li>• <b>North Valley Bridge was raised and would remain open during flooding events and providing access for emergency services and the public</b></li> <li>• Valley City Permanent Flood Protection Project - Phase I (University District) was completed in 2016. Phase II (Downtown District) was completed in 2019. Additional phases scheduled through 2027.</li> </ul>
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**Table 4.7.4 – Barnes County Flood Risk Assessment – Continued**

<b>Capability</b>	<p><u>Administrative and Technical</u></p> <ul style="list-style-type: none"> <li>• <b>FEMA Flood Maps – being updated to include enhanced aerial imagery and the base level engineering data</b></li> <li>• Active County Commission and City Council(s)</li> <li>• Contracts for engineering, planning, and grant writing</li> <li>• GIS services are provided by tax equalization and 9-1-1 on the county level, and state and engineering firms</li> <li>• City of Valley City with GIS capabilities</li> <li>• Barnes County Water Resource Board</li> <li>• ND State Water Commission ND Risk Assessment Mapping (NDRAM)</li> </ul> <p><u>Education and Outreach</u></p> <ul style="list-style-type: none"> <li>• Active emergency management department with education and outreach capabilities</li> <li>• Barnes County Water Resource District provides regulation to land-owners for issues pertaining to water</li> </ul> <p><u>Financial</u></p> <ul style="list-style-type: none"> <li>• Relies on federal and state entities for assistance with major projects (Valley City Permanent Flood Protection Project)</li> </ul> <p><u>Planning and Regulatory</u></p> <ul style="list-style-type: none"> <li>• Barnes County Water Resource Board</li> <li>• Barnes County Planning and Zoning Committee and Administrator/Floodplain Administrator</li> <li>• City of Valley City Flood Plain Ordinances</li> <li>• County adopted NFIP and related flood ordinances</li> <li>• Natural Resource Conservation Service</li> <li>• ND State Water Commission ND Risk Assessment Mapping (NDRAM)</li> <li>• ND State Water Commission also has regulations in place for surface water</li> <li>• Valley City Planning &amp; Zoning Committee and Administrator</li> <li>• Valley City Emergency Flood Plan</li> </ul>
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### **Vulnerabilities to Publicly-Owned Buildings and Property**

Vulnerabilities to publicly-owned buildings and property from floods are always present whether flooding is due to flash flooding, overland, ground seepage, river channel, or closed basin. Locations of publicly-owned buildings and property will determine vulnerabilities to river channel and overland flooding. Publicly-owned buildings and property in the city of Valley City and the Sheyenne River Valley are most vulnerable to flooding – City-County Health District, Barnes County Courthouse, Valley City City Hall, Valley City Fire Department Fire Hall, Valley City Police Department, Valley City State University, public schools, among others. A summary of publicly-owned buildings and property is provided in Chapter 3, Profile and Inventory.

The Valley City Permanent Flood Protection Project will significantly reduce/eliminate the vulnerability of flooding to publicly-owned buildings and property in the city of Valley City. Construction of the project is expected through 2027.

### **Vulnerabilities of Critical Facilities and Infrastructure**

Damage to critical facilities and infrastructure such as drinking/potable water and sewer systems, roadways, and electric power lines can happen when flooding occurs. Drinking/potable water and sewer systems can be shut down when power to lift stations and water treatment facilities are suspended, or the systems become overwhelmed. Roads can be washed out or blocked from overland flooding, which limits access for emergency services. Profile meeting participants and the Steering Committee identified BNSF Railroad, CP Railway, Interstate 94, pipelines, and drinking/potable water and wastewater infrastructure as critical infrastructure most vulnerable to flooding. An inventory of critical facilities and infrastructure is provided in Chapter 3, Profile and Inventory.

- The Valley City Permanent Flood Protection Project will significantly reduce/eliminate the vulnerability of flooding to critical facilities and infrastructure in the city of Valley City. Construction of the project is expected through 2027. However, the 4<sup>th</sup> St. Bridge (both east and west), Rainbow Bridge, Mill Dam, Little Dam, Viking Drive, and Hospital Bridges will be closed during flooding events to complete the efficacy of the Valley City Permanent Flood Protection Project. This will result in the 8<sup>th</sup> Avenue Bridge being the only bridge open during flood events. The North Valley bridge was raised and will remain open during flooding events.
- The Barnes County Highway Department has completed extensive retrofitting of bridges, culverts, and road grades that have eliminated the impact of flooding in rural areas of the county. Table 4.7.5 on the following page shows a summary of these investments.

### **Vulnerabilities to New and Future Development**

New and future development in Barnes County is at high risk to flooding if allowed in a floodplain. With projected local populations stable in Barnes County through 2030, more people will be vulnerable to flooding if development is not restricted from flood-prone areas.

The Valley City Permanent Flood Protection Project will significantly reduce/eliminate the vulnerability of flooding to new and future development in the city of Valley City. Construction of the project is expected through 2027.

Table 4.7.5 – Barnes County Highway Department Infrastructure Investments

Project Name	Roadway	Completion date	Funding Source	Local Share	Total Cost
Eckelson Lake Grade Raise	22	10/1/2015	Fed. ER Funds & Local	\$214,537.84	\$1,072,689.20
Sanborn Lake Grade Raise- East of ND#1	22	10/1/2011	Fed. ER Funds & Local	\$171,328.31	\$1,064,821.97
Sanborn Lake Grade Raise- West of ND #1	22	9/15/2012	Fed. ER Funds & Local	\$243,430.66	\$1,217,153.32
Meadow Lake Grade Raise	7	8/25/2015	Fed. ER Funds & Local	\$276,130.96	\$1,380,654.83
Meadow Lake Erosion Control	7	5/1/2021	Fed. ER Funds	\$0.00	\$140,687.70
Meadow Lake Re-alignment	32	8/25/2015	Fed. ER Funds & local	\$66,471.26	\$332,356.31
Faust Dam Bridge Replacement & Raise	17	8/19/2017	SB2103 & Fed. Aid	\$0.00	\$1,293,800.00
North Valley Bridge Replacement	21	11/17/2012	Fed. Aid & Local Bridge Bond	\$514,762.17	\$2,699,329.68
Raritan Township Bridge Replacement	Township	8/3/2019	Local Bridge Bond	\$291,832.00	\$291,832.00
Hobart Safety Grade Raise	22	8/15/2020	Fed. Safety & Local	\$206,226.37	\$1,551,063.78
Sanborn Road Grade Raise	11	Fall 2021	Fed. ER Funds & Local	\$382,133.09	\$2,472,760.14
River Road Box Culvert installation	19	Fall 2021	Fed. ER Funds & Local	\$77,987.70	\$545,761.56
Kathryn Hill Slide Repair	21	Fall 2021	Fed. ER Funds & Local	\$472,900.92	\$2,682,633.97
Sheyenne River Erosion Control	21	5/1/2021	Fed. ER Funds & Local	\$238,461.65	\$1,255,454.39
Kathryn CMP Replacement	21	8/1/2020	Local Hwy funds	\$145,628.52	\$145,628.52
<b>TOTAL</b>				<b>\$3,301,831.45</b>	<b>\$18,146,627.37</b>

### Data Limitations

The lack of digitized records of public assistance provided to local governments from flood events makes flood mitigation planning difficult to comprehend during mitigation planning processes.

#### National Climatic Data Center/National Oceanic and Atmospheric Administration

The hazard history provided through the National Climatic Data Center/National Oceanic Atmospheric Administration's Storm Events Database contains data from **1950 to 2020**, as entered by NOAA's National Weather Service (NWS). Due to changes in the data collection and processing procedures over time, there are unique periods of record available depending on the event type. The following timelines show the different time spans for each period of unique data collection and processing procedures.

#### **Flooding was not recorded as a separate incident until 1996.**

- 1. Tornado:** From 1950 through 1954, only tornado events were recorded.
- 2. Tornado, Thunderstorm Wind and Hail:** From 1955 through 1992, only tornado, thunderstorm wind and hail events were keyed from the paper publications into digital data. From 1993 to 1995, only tornado, thunderstorm wind and hail events have been extracted from the Unformatted Text Files.
- 3. All Event Types (48 from Directive 10-1605):** From 1996 to present, 48 event types are recorded as defined in NWS Directive 10-1605.

### Other Key Documents

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following documents.

- 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)
- Barnes County Capital Improvement Plan
- Barnes County Comprehensive Plan
- Barnes County Evacuation and Shelter Plan
- Barnes County Local Emergency Operations Plan
- Barnes County Shelter and Mass Care Plan
- Barnes County Threat and Hazard Identification and Risk Assessment (THIRA)
- National Flood Insurance Program (and required flood ordinances)
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan, Flood Annex
- North Dakota League of Cities: Planning and Zoning Handbook
- North Dakota Risk Assessment Mapping (RAM) Service (flood mapping software)
- North Dakota State Building Code
- North Dakota State Disaster Recovery Plan
- North Dakota State Preparedness Report (SPR)
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)
- Valley City Capital Improvement Plan

## 4.8 Geologic Hazard

Including abandoned mine lands, earthquakes, environmental minerals (erionite, uranium, arsenic), environmental minerals (radon), expansive/unstable soils, landslides, meteorite falls, and volcanic hazards.

### Characteristics

A geologic hazard, and the different classifications of the hazard, are described as follows:

- **Abandoned Mine Lands (AMLs):** AMLs are hazardous mine subsidence and are caused by the collapse of abandoned underground mines.
- **Earthquake:** An Earthquake is a sudden movement of the earth caused by the abrupt release of strain that has accumulated over a long time.
- **Environmental Minerals (Erionite, Uranium, Arsenic):** These minerals, and the rocks that host them, are hazardous with localized and prolonged exposure.
- **Environmental Minerals (Radon):** Radon is a colorless, odorless, and tasteless gas that originates from the radioactive decay of uranium minerals found in soils and in igneous rock and their derivative mineral weathering products.
- **Expansive/Unstable Soils:** Expansive/unstable soils are soils that expand when water is added and shrink when they dry out.
- **Landslides:** Landslides are the movement of rock, soil, artificial fill, or a combination thereof on that moves down-slope.
- **Meteorite Falls:** Meteorite Falls are samples of early solar system materials.
- **Volcanic Hazards:** Geologic impacts from volcanic activity.

<b>Seasonal Pattern</b>	None. Can occur at any time throughout the year. Most prevalent after heavy precipitation events such as severe summer or winter weather.
<b>Duration</b>	Seconds/Hours/Days/Weeks/Months/Years
<b>Speed of Onset</b>	Seconds/Hours/Days/Weeks/Months/Years
<b>Location</b>	Depends on the extent/magnitude of each specific geologic hazard characteristic but can be county-wide across all jurisdictions (incorporated and/or unincorporated) for Expansive/Unstable Soils in river valley areas or ubiquitous risk of Environmental Minerals (Radon) across the county.  According to the N.D. Public Service Commission (PSC) there are no records of abandoned mine lands in Barnes County.

For more information regarding geologic hazard please reference the **2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)**. The state plan can be accessed by following the electronic hyperlink or link to the N.D. Dept. of Emergency Services website:

[2018 North Dakota Enhanced Mitigation Mission Area Operations Plan](#)

<https://www.des.nd.gov/planning>

## History

The history of geologic hazard was obtained by U.S. Dept. of Agriculture, Risk Management Agency; N.D. Dept. of Environmental Quality; Valley City-Barnes County Development Corporation; the 2018 N.D. Enhanced Mitigation MAOP; Barnes County Emergency Management; and the N.D. Dept. of Transportation. A detailed hazard history for Barnes County can be found on a disc located at the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment.

- **Abandoned Mine Lands (AMLs).** There are no AMLs located in Barnes County.

**Earthquake.** There is not a history of earthquakes in Barnes County. Figure 4.8.3 illustrates the locations of earthquakes in North Dakota as of 2015.

U.S. Dept. of Agriculture, Risk Management Agency

Crop loss from drought is tracked by the U.S. Dept. of Agriculture, Risk Management Agency (RMA). The RMA provides data on the crop type affected, damage cause description, determined acres, and indemnity amount. The damage-cause description identifies the cause of damage and the number of acres lost due to damage, and the indemnity amount identifies the total amount of the loss for the designated peril. **Between January 1, 2001, and December 31, 2020, Barnes County experienced two incidents of crop loss due to earthquakes impacting approximately 36.29 acres of crops totaling \$2,038.00 in losses.**

- **Environmental Minerals (Erionite, Uranium, Arsenic).** There is not a history of environmental minerals (erionite, uranium, arsenic) soils events in Barnes County.
- **Environmental Minerals (Radon).** According to the **N.D. Dept. of Environmental Quality**, between January 1, 2016, and March 2, 2021, there were approximately 66 positive tests for radon in residential homes in Barnes County.
- **Expansive/Unstable Soils.** There is a history of expansive/unstable soils events within Barnes County in the city of Valley City. According to Valley City-Barnes County Development Corporation, subsurface moisture in the northwest corner of Valley City is pushing streetlights out of the ground between 18 to 24 inches. The expansive/unstable soils have also caused problems with two existing buildings. Terracon drilled borings to collect data on subsurface moisture to develop a plan and cost estimates the week of September 6, 2021.
- **Landslides.** The following information on landslides in the city of Valley City and Barnes County was obtained from the Valley City-Barnes County Development Corporation, the 2018 N.D. Enhanced Mitigation MAOP, Barnes County Emergency Management, and the N.D. Dept. of Transportation.

Valley City-Barnes County Development Corporation

On September 15, 2021, in southeast Valley City a ridge that runs from Interstate 94 Exit 294 along the north side of land owned by the development corporation, N.D. National Guard’s new facilities maintenance center, John Deere Seeding Group and Malach USDA to 12<sup>th</sup> Avenue NE. A section along the ridge line has been impacted by landslides. On the west end of the ridge, the ground has given away creating major concerns for the Malach Manufacturing Plant. See Figure 4.8.1. The land shift is within approximately 20 feet of the main plant where concrete slab is tipping up about 12 inches. Further, the ground has given away immediately adjacent to the cold storage building. The development corporation has approved funds to cost share the \$30,000.00 study to identify solutions.



Source(s): Valley City-Barnes County Development Corporation

2018 N.D. Enhanced Mitigation MAOP

According to the 2018 N.D. Enhanced Mitigation MAOP, North Dakota has only had one disaster declaration due to a geologic hazard: DR-1279 was declared for severe storms, tornadoes, snow and ice, flooding, ground saturation, and landslides/mudslides. The event occurred from March 1, 1999, to July 19, 1999, and impacted 42 counties and four reservations. Over \$100 million in disaster assistance was provided. Barnes County was included in this disaster declaration. Figure



4.8.4 illustrates areas of the state of North Dakota mapped by the N.D. Geological Survey to show landslide susceptibility. The Sheyenne River Valley has large amounts of landslide deposits.

Slope failures occurred on Riverview Drive in Valley City in the late 1990s.

### City of Valley City

- West side of the city of Valley City there is a project in place for the I-94 Business Loop. Project will be completed in 2022
- West side of the city of Valley City streetlights had issues resulting in abandoning of one line
- On the east side of the city of Valley City, Cass County had to repair electric lines three times in the summer of 2021
- North of the city of Valley City there was a culvert that failed and the road washed out on a major road to Baldhill Dam
- Two areas between N.D. Highway 46 and the city of Valley City had slides where currently the road is down to one lane in one spot and marked off on another
- North of the city of Valley City on the road heading north under the bridge before 21<sup>st</sup> and the hill
- On the south side of Lake Ashtabula, Barnes Rural Water District had to replace their water lines due to landslides

### Barnes County Emergency Management

- **1993.** One home in the SW section of Valley City was lost to a landslide in 1993.
- **1997.** A home slid in "Johnsonville" east of Valley City limits off Main Street.
- **1999 to 2001.** Ten homes slid. Also, Valley City lost two streets. Barnes County lost one road off N.D. Highway 46 into Little Yellowstone Park. Barnes County lost one home.
- **1998.** Relocation through a Valley City- FEMA project was attempted to a lot that slid.
- **June 15, 2007, 7:30 a.m.** Situation/Incident in Barnes County was reported for complications of the June 7<sup>th</sup> rain, mudslide. Damages to fiber optic cable from the roads and mudslide. A sonic alarm went off at 3:57 to alert Dickey Rural Network of a breach in the cable line somewhere in a 2mile stretch by Kathryn, ND. Barnes County/Valley City dispatch was called between 4:30 and 5:00am. The Sheriff's Department was called, Emergency Management was not alerted. The DRN road crew saw the mudslide and located the problem. A 400 ft. piece of cable was replaced and service was restored about noon.

- **October 22, 2010.** Damage from excess rains, wet conditions saturating the ground and underground springs have caused the ground to shift and landslides to occur at Lee's Subdivision. This results in sinking cabin which have needed to be moved, cracking foundations and once rock road down to Lake Ashtabula is no longer usable as the land has shifted. Eight of roughly 25 homes in the area affected by the sloping land, which has created large cracks and unstable soil near some properties. (Source: Valley City Times-Record)
- **October 22, 2010.** Damage from excess rains, wet conditions saturating the ground and underground springs have caused the ground to shift and landslides. This results in sinking cabin which have needed to be moved, cracking foundations and grave; road down to Lake Ashtabula is no longer usable as the land has shifted the roadway. (Source: Valley City Times-Record)
- **May 18, 2011.** The Katie Olson Recreation Area was closed in 2010 over safety concerns over the road leading to the subdivision. Erosion has caused the hillside to slide toward the shoreline of Lake Ashtabula, leaving cliffs in the gravel road that heads to the Katie's Landing properties, the road dropping nearly five feet in some areas. (Source: Valley City Times-Record)
- **October 2020.** 12 Cabins at Martin's Landing on Lake Ashtabula experienced loss of rural water due to hill slide. Total cost to repair was \$85,500.
- **October 2020.** 10 Cabins at Sunset Landing on Lake Ashtabula experienced loss of rural water due to hill slide. Total cost to repair \$45,000
- **October 2020.** Rural water to Camp Davis on Lake Ashtabula was lost due to hill slide and land shifting. Total Cost to repair \$73,000
- **October of 2020.** Bob Lee's Landing on Lake Ashtabula experienced a failure in the Barnes Rural Water system due to a hill slide and ground shifting, total cost to repair this area was approximately \$247,000.
- **October of 2020.** Valley Township Section 30 in Barnes County suffered from issues to the Barnes Rural Water system due to hill slide and land shifting. Cost to repair \$10,900.
- Riverbed eroded 10 miles south of VC riverbank stabilization work completed in 2021 to stabilize the riverbank from further erosion.
- Kathryn Hill Slide 16 miles South of Valley City road stabilization completed in Summer of 2021. Project site was approximately ¼ mile in length.
- Hill Slide ½ mile North of Valley City in summer of 2021
- Hill Slide 1 mile South of Kathryn in summer of 2021.

N.D. Dept. of Transportation

According to the N.D. Dept. of Transportation, the following landslide incidents have occurred in Barnes County.

- I-94 westbound, between exit 292 and 290, north side of roadway, approximate cost of \$8.4 million. See Figure 4.8.2 below.
- I-94 eastbound, the SW corner of exit 290, approximate cost of \$0.4 million.

**Figure 4.8.2 – Interstate 94 Between Exist 292 and 290 Landslide Repair Anchors**



Source(s): N.D. Dept. of Transportation

- **Meteorite Falls.** There is not a history of meteorite falls in Barnes County.
- **Volcanic Hazards.** There is not a history of volcanic hazards in Barnes County.

**There have been one presidential disaster declarations pertaining to geologic hazard (landslide) in Barnes County.**

**Probability**

The probability of a hazard or threat is how likely it is it will happen. The 2018 N.D. Enhanced Mitigation (MAOP) classifies each type of geologic hazard’s probability below.

<b>Common Occurrence</b>	Abandoned Mine Lands (AMLs), Expansive/Unstable Soils, Environmental Minerals (Radon) and Landslides
<b>Limited Occurrence</b>	Environmental Minerals (Erionite, Uranium, Arsenic), Earthquake
<b>Remote Occurrence</b>	Meteorite Falls and Volcanic Hazards

Note: Due to their classification as remote occurrences, detailed information on meteorite falls and volcanic hazards is not available.

The Steering Committee identified the state’s definitions for probability of geologic hazard as applicable to Barnes County. The following probability for geologic hazard in Barnes County is as follows:

- **Abandoned Mine Lands (AMLs).** According to the N.D. Public Service Commission (PSC), there are no Abandoned Mine Lands in Barnes County. The probability of this type of geologic hazard is zero.
- **Earthquake.** The likelihood of earthquake occurrence in North Dakota is low. However, small magnitude earthquakes, commonly in the range of magnitude 3, which are not felt at the surface, have occurred in the state at the rate of approximately one event per decade (N.D. Geologic Survey). The locations of these earthquakes vary but has never occurred in Barnes County. The probability of earthquake in Barnes County is low.
- **Environmental Minerals (erionite, uranium, arsenic).** This type of geologic hazard is localized to its area of geologic origination. They are not expansive or extensive and not found in Barnes County at high concentrations based on available information. Gravel mining in western North Dakota excavated deposits of these minerals to be used in surfacing of roads, parking lots and other infrastructure surfaces throughout the state. The probability of an exposure incident is unknown in Barnes County Therefore, the probability of this geologic hazard would be low to unknown in Barnes County.
- **Environmental Minerals (radon).** All of North Dakota is in EPA Radon Zone 1. Therefore, all counties in the state are vulnerable to this hazard and all homes have a high potential to test for elevated levels of radon. According to the 2018 N.D. Enhanced Mitigation (MAOP), there is greater than a 90 percent chance of this type of geologic hazard occurring each year anywhere in the state.
- **Expansive/Unstable Soils.** This type of geologic hazard can be found across North Dakota and is exacerbated by drought and periods of high precipitation. Therefore, the probability of expansive/unstable soils can be tied to the severity of other natural hazards that can occur at any

time throughout the year.

**The probability of expansive/unstable soils continuing to impact public infrastructure such as streetlights in Valley City is highly likely to occur in the future until mitigation measures are implemented.**

- **Landslides.** Landslide events are indicative of moisture conditions as they occur more frequent during wet years and are even more probably if the wet years were preceded by dry years. According to the N.D. Enhanced Mitigation (MAOP), the probability of future occurrences of landslides is low in Barnes County as no areas of high susceptibility are identified. According to mapping provided by the N.D. Geological Survey, landslides are most common and most prevalent within hydrologic corridors and other areas of high relief. The Sheyenne River Valley would be classified as a hydrologic corridor. Figure 4.8.4 illustrates the amount of landslide deposits in Barnes County in the Sheyenne River Valley, and Figures 4.8.5 and 4.8.6 illustrate the areas of landslides in the city of Valley City.

**The probability of landslides in Barnes County is highly likely due to local topography and areas prone to sliding.**

- **Meteorite Falls.** This type of geologic hazard is classified as a remote occurrence and, therefore, the probability is very low.
- **Volcanic Hazards.** This type of geologic hazard is classified as a remote occurrence and, therefore, the probability is very low.

### Extent/Magnitude

The extent/magnitude of a hazard or threat is expressed in the amount and/or number of damages or losses either actualized in a community or estimated based on known assets and levels of risk. Jurisdictions with the highest number of abandoned mine lands, hydrologic corridors, locations with expansive/unstable soils or other geologically active areas are at the greatest risk to impacts from occurrences of geologic hazards.

- **Abandoned Mine Lands (AMLs).** The extent/magnitude of the collapse of an AML is specific to the location and size of the AML. Therefore, the extent/magnitude can range from no damage at the surface to extensive if impacting structures or infrastructure.
- **Earthquake.** A HAZUS Analysis was completed in the N.D. 2018 Enhanced Mitigation (MAOP) to estimate losses from a magnitude 5 earthquake. The total economic losses to Barnes County are estimated at greater than \$1.5 million from this type of event.
- **Environmental Minerals (erionite, uranium, arsenic).** This type of geologic hazard is localized to its area of geologic origination. They are not expansive or extensive and not found in Barnes County at high concentrations based on available information. Therefore, the extent/magnitude of this geologic hazard would be low or unknown in Barnes County.

- **Environmental Minerals (radon).** Based on information provided by the N.D. Dept. of Environmental Quality, prolonged exposure to radon can cause lung cancer. Based on a U.S. Environmental Protection Agency (EPA) assessment of risk for radon in homes, radon in indoor air is estimated to cause about 21,000 lung cancer deaths each year in the United States. Radon-induced lung cancer typically develops 5-25 years after exposure. There is no evidence that other respiratory diseases, such as asthma, are caused by radon exposure.
- **Expansive/Unstable Soils.** The extent/magnitude of expansive/unstable soils event could render a structure uninhabitable or unusable. Damage from this type of geologic event could also result in either short-term or prolonged loss of service of transportation or energy infrastructure. The extent/magnitude of expansive/unstable soils in Barnes County as of September 2021, includes destruction of streetlights and two privately owned buildings. The number of damages is not yet known.
- **Landslides.** The extent/magnitude of a landslide event could render a structure uninhabitable or unusable. Damage from this type of geologic event could also result in either short-term or prolonged loss of service of transportation, communication, or energy infrastructure. Multiple landslide events have occurred in Barnes County shutting down roads/highways and resulting in the relocation of homes and structures costing millions of dollars in losses.
- **Meteorite Falls.** The extent/magnitude of a meteorite fall is unknown as it has never occurred in Barnes County.
- **Volcanic Hazards.** There are no volcanoes in Barnes County.

Figure 4.8.3 – 2015 Earthquakes in North Dakota

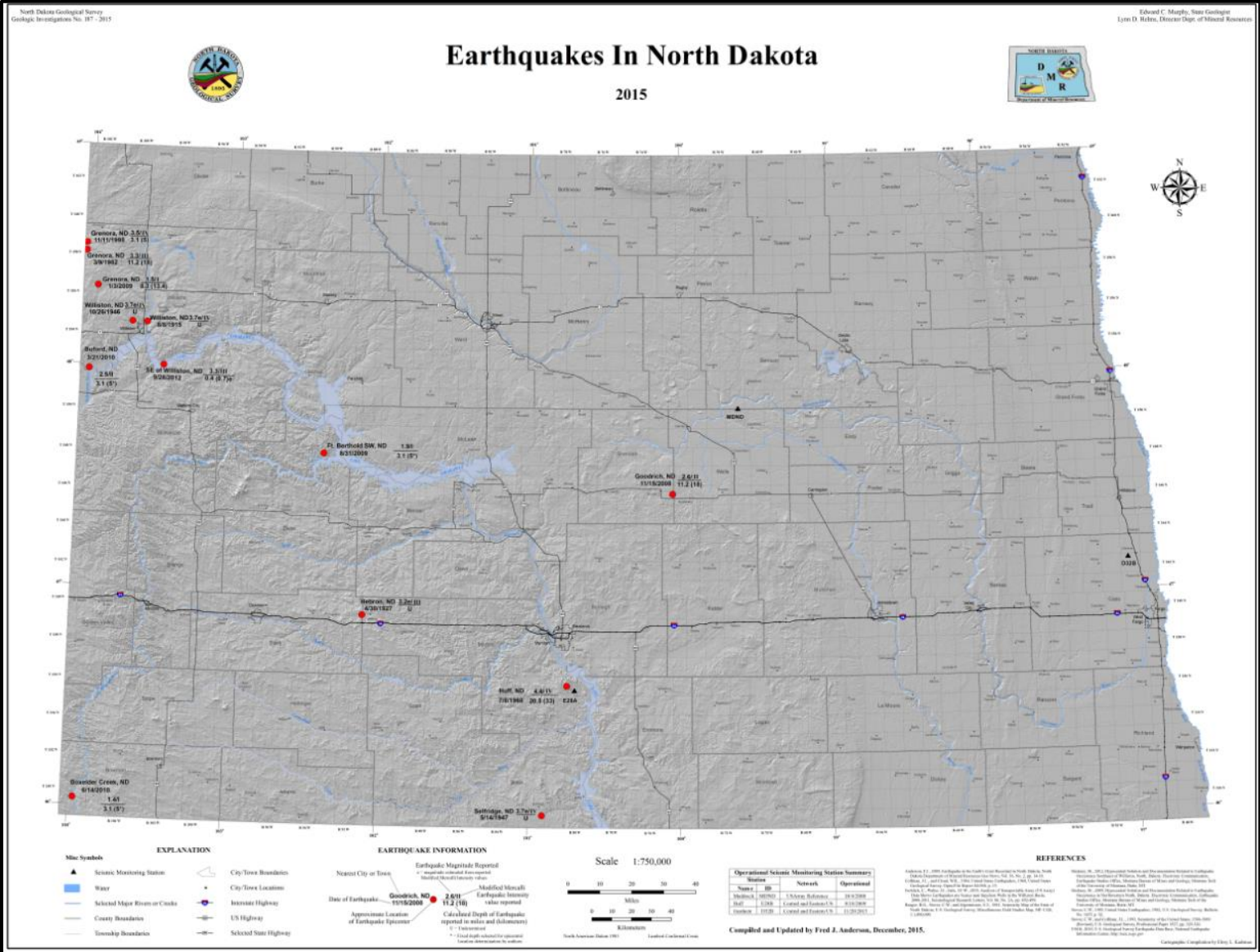
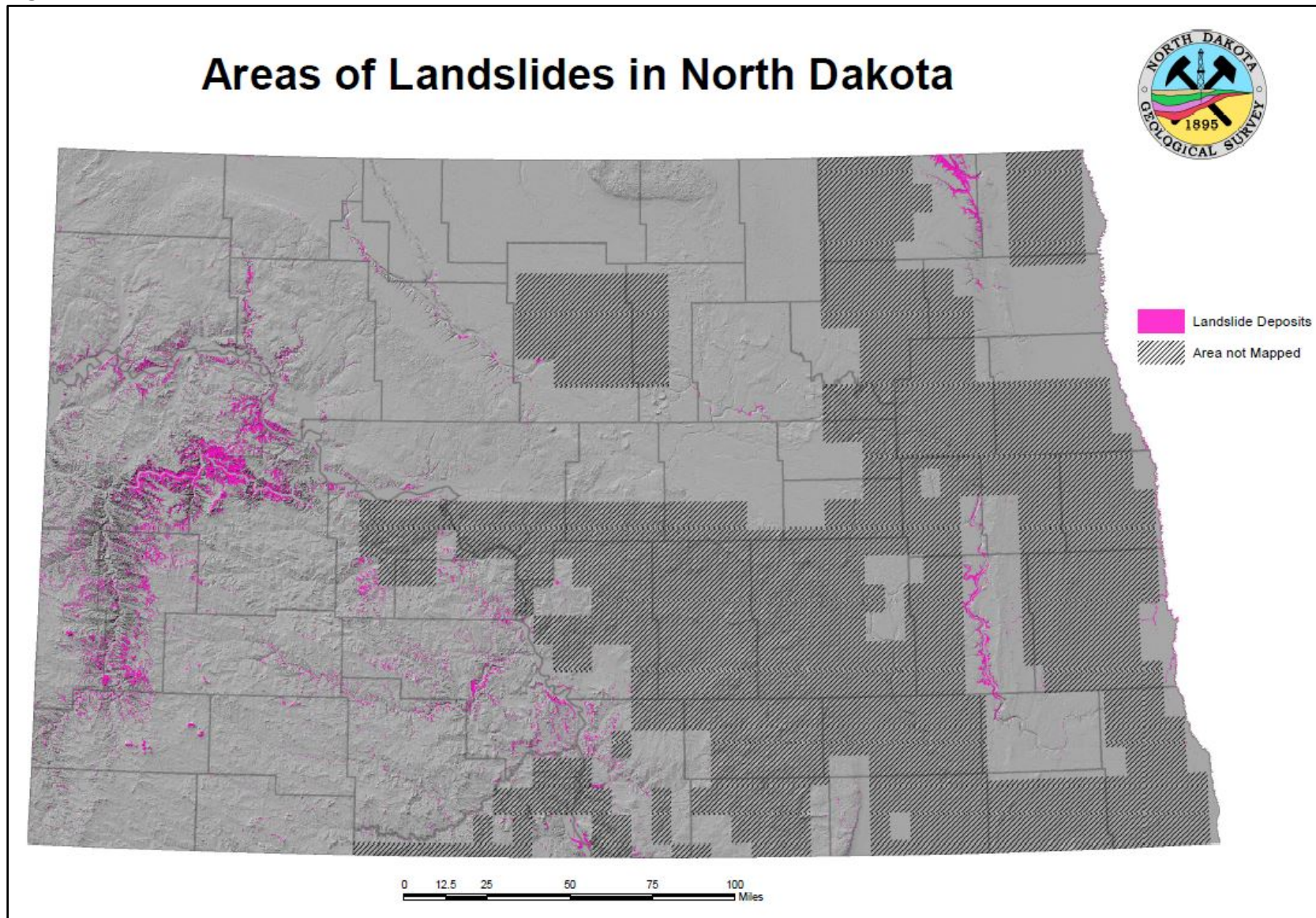


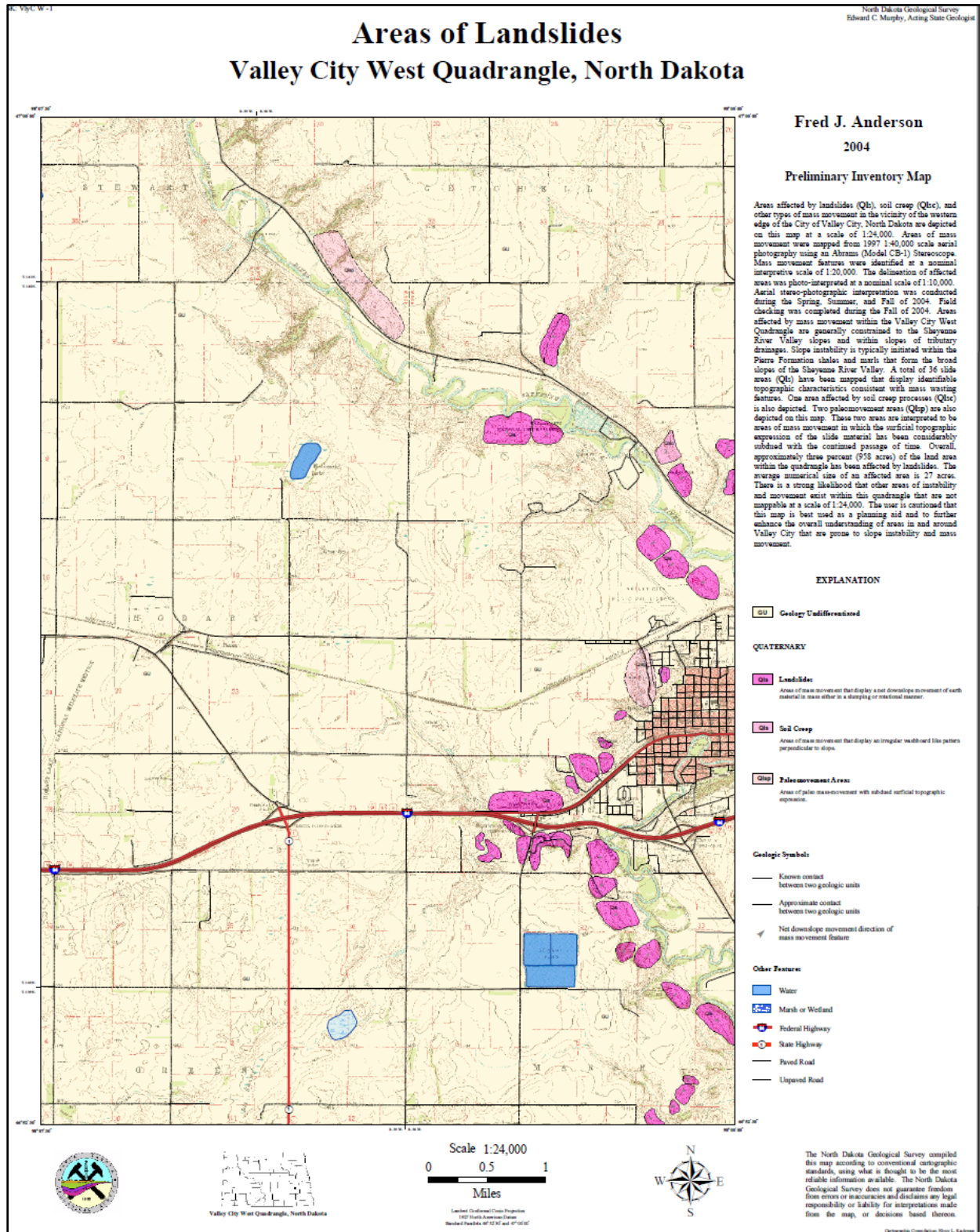
Figure 4.8.4 – 2021 Landslides in North Dakota



Source(s): N.D. Geological Survey

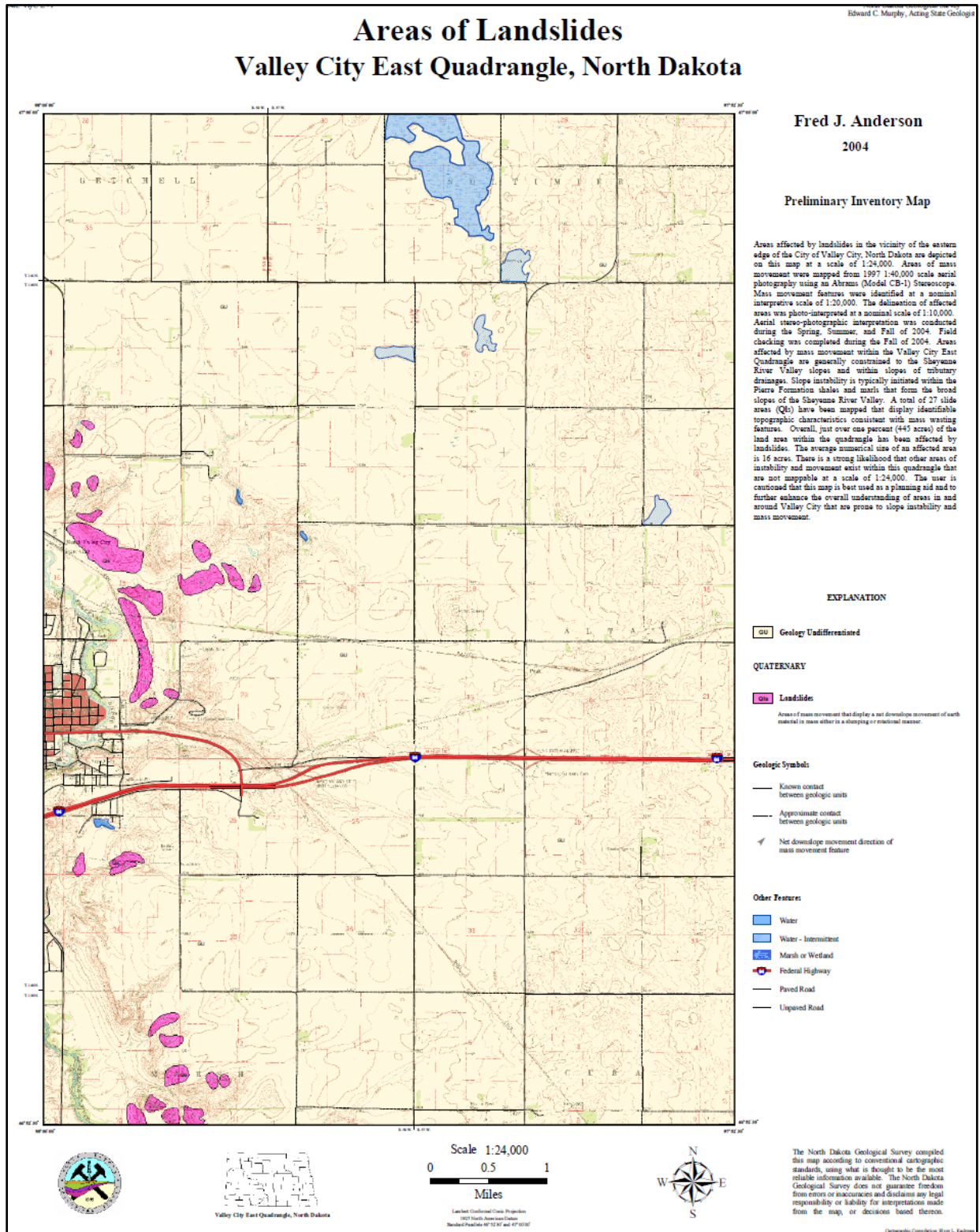


Figure 4.8.5 – 2004 Areas of Landslides in Valley City West Quadrangle



Source(s): Barnes County Emergency Management

Figure 4.8.6 – 2004 Areas of Landslides in Valley City East Quadrangle



Source(s): Barnes County Emergency Management

## Risk Assessment

Table 4.8.2 shows the risk assessment as determined by individual jurisdictions, the Steering Committee, and meeting participants at the profile meeting for geologic hazard. The risk assessment methodology can be found in the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA). The total in Table 4.8.2 represents the sum of each jurisdiction's impact, frequency, likelihood, and vulnerability to a hazard/threat less the jurisdiction's capabilities to respond to the hazard/threat.

**Table 4.8.2 – Barnes County Geologic Hazard Risk Assessment Scored Chart Summary**

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	2	3	2	3	2	<b>8</b>
Dazey	NA	NA	NA	NA	NA	<b>NA</b>
Fingal	NA	NA	NA	NA	NA	<b>NA</b>
Kathryn	4	3	3	4	1	<b>13</b>
Leal	NA	NA	NA	NA	NA	<b>NA</b>
Litchville	NA	NA	NA	NA	NA	<b>NA</b>
Nome	NA	NA	NA	NA	NA	<b>NA</b>
Oriska	NA	NA	NA	NA	NA	<b>NA</b>
Pillsbury	NA	NA	NA	NA	NA	<b>NA</b>
Rogers	NA	NA	NA	NA	NA	<b>NA</b>
Sanborn	NA	NA	NA	NA	NA	<b>NA</b>
Sibley	4	2	4	4	1	<b>13</b>
Valley City	3	2	3	3	1	<b>10</b>
Wimbledon	NA	NA	NA	NA	NA	<b>NA</b>

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Tables 4.8.3 provides information on the specific impact, frequency, likelihood, vulnerability, and capability of geologic hazard in Barnes County. A list of impacts identified as commonplace for natural hazards and man-made threats regardless of the jurisdiction is shown in Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA).

**Table 4.8.3 – Barnes County Geologic Hazard Risk Assessment**

<b>Impact</b>	<ul style="list-style-type: none"> <li>Blocked Roads &amp; Delayed Emergency Response</li> <li>Business &amp; Government Interruptions</li> <li>Infrastructure Degradation</li> <li>Loss of Power/Electricity Outage</li> <li>Soil Degradation/Erosion</li> </ul>	<ul style="list-style-type: none"> <li><b>Short-term or prolonged loss of transportation services, communication, or energy infrastructure.</b></li> <li><b>Structures could become uninhabitable or unusable.</b></li> <li><b>Damage to public infrastructure (streetlights) in Valley City and privately owned buildings</b></li> <li>Over \$100 million in disaster assistance was provided to the state of North Dakota for DR-1279.</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>DR-1279 from March 1, 1999, to July 19, 1999, and impacted 42 counties and four reservations. Over \$100 million in disaster assistance was provided. Barnes County was included in this disaster declaration.</li> </ul>	<ul style="list-style-type: none"> <li>Between January 1, 2016, and March 2, 2021, there were approximately 66 positive tests for radon in residential homes in Barnes County.</li> </ul>
<b>Likelihood</b>	<p><u>More likely</u></p> <ul style="list-style-type: none"> <li>All North Dakota counties are in EPA Radon Zone 1</li> <li>Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> <li>Presence of Sheyenne River Valley Hydrologic Corridor</li> </ul>	<p><u>Less likely</u></p> <ul style="list-style-type: none"> <li>Abandoned mine reclamation projects by the N.D. Public Service Commission</li> <li>No AMLs in Barnes County</li> </ul>
<b>Vulnerability</b>	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> <li>All North Dakota counties are in EPA Radon Zone 1</li> <li>Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> <li>Presence of Sheyenne River Valley Hydrologic Corridor</li> <li><b>Barnes County not entirely mapped for landslide susceptibility by the N.D. Geological Survey</b></li> </ul>	<p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> <li>Building codes and zoning</li> <li>Landslide mapping by N.D. Geological Survey</li> <li>Abandoned mine reclamation projects by the N.D. Public Service Commission</li> <li>No AMLs in Barnes County</li> <li>Areas of greatest landslide susceptibility mapped by N.D. Geological Survey</li> </ul>
<b>Capability</b>	<ul style="list-style-type: none"> <li>The federal reclamation fee on coal that has been mined in the United States since the 1970s funds the N.D. Public Service Commission abandoned mine reclamation projects. The landslide mapping done by the N.D. Geological Survey identifies the location and extent/magnitude of existing landslides and provides context to direct future development.</li> </ul>	

### Vulnerabilities to Publicly-Owned Buildings and Property

According to the N.D. Enhanced Mitigation (MAOP), the following vulnerabilities exist to publicly-owned buildings and property from the following geologic hazards:

- **Abandoned Mine Lands (AMLs).** According to the PSC, no known publicly owned buildings or infrastructure are believed to be affected.
- **Environmental Minerals (erionite, uranium, arsenic).** This type of geologic hazard is localized to its area of geologic origination. They are not expansive or extensive and not found in Barnes County at high concentrations based on available information. Therefore, publicly-owned buildings and property in Barnes County are not vulnerable.
- **Environmental Minerals (radon).** Radon poses a risk to all publicly-owned buildings and infrastructure as all North Dakota counties are in the EPA Zone I. Radon could cause economic impacts or impacts to the functioning of government services through prolonged exposure to employees that may develop lung cancer.
- **Expansive/Unstable Soils.** Subsurface moisture in the northwest corner of Valley City is pushing streetlights out of the ground between 18 to 24 inches. The expansive/unstable soils have also caused problems with two existing buildings. This vulnerability to publicly owned buildings and property will continue unless mitigation measures are implemented or development is restricted in areas with expansive/unstable soils.
- **Landslides.** Most structures remain unaffected by known impacts from landslides. However, if damage were to occur, the continuity of publicly owned buildings and property could be disrupted. As of September 2021, no publicly owned buildings or property are at risk to landslides.
- **Meteorite Falls.** No known vulnerability to publicly-owned buildings and property.
- **Volcanic Hazards.** No known vulnerability to publicly-owned buildings and property.

### Vulnerabilities of Critical Facilities and Infrastructure

Like publicly-owned buildings and property, critical facilities and infrastructure could be impacted by geologic hazards. The primary threats to critical facilities and infrastructure from geologic hazards are to county, city and township road systems, and transportation, communication, and energy infrastructure. Electrical grid facilities and transportation infrastructure are the most likely to be impacted if a geologic hazard event occurred. The delivery of goods and services could be disrupted if damage occurred to transportation infrastructure. Medical care facilities and emergency response capabilities would be impacted by power outages (whether prolonged or brief) occurring from geologic hazards. A summary of publicly-owned buildings is provided in Chapter 3, Profile and Inventory.

- **Abandoned Mine Lands (AMLs).** According to the PSC, No known publicly owned buildings or infrastructure are believed to be affected.

- **Environmental Minerals (erionite, uranium, arsenic).** Critical facilities and infrastructure are not at risk to Environmental Minerals.
- **Environmental Minerals (radon).** Radon poses a risk to all publicly-owned buildings and infrastructure as all North Dakota counties are in the EPA Zone I. Radon could cause economic impacts or impacts to the functioning of government services through prolonged exposure to employees that may develop lung cancer.
- **Expansive/Unstable Soils.** Most critical facilities in Barnes County remain unaffected by known impacts from expansive/unstable soils as they are located away from these hazardous areas. However, if damage were to occur, the services provided by the impacted critical facility or infrastructure could be disrupted resulting in either temporary or prolonged shortages or outages.
- **Landslides.** Most critical facilities remain unaffected by known impacts from landslides. However, if damage were to occur, the services provided by the impacted critical facility or infrastructure could be disrupted resulting in either temporary or prolonged shortages or outages. Roadways are the primary infrastructure vulnerable to landslides in Barnes County. As noted in the history section, several township roads, county highways, and state highways have been impacted by landslides.
- **Meteorite Falls.** No known vulnerability to critical facilities and infrastructure.
- **Volcanic Hazards.** No known vulnerability to critical facilities and infrastructure.

### Vulnerabilities to New and Future Development

New development would largely avoid physical impact from geologic hazards and are not vulnerable if located away from AMLs or area susceptible to expansive/unstable soils or landslides. However, incorporated jurisdictions lacking zoning and building codes and/or enforcement can be more vulnerable to geologic hazards as this oversight in development is lacking.

- **Abandoned Mine Lands (AMLs).** No vulnerability to new and future development in Barnes County.
- **Environmental Minerals (erionite, uranium, arsenic).** No vulnerability to new and future development in Barnes County.
- **Environmental Minerals (radon).** New and future development will be vulnerable to Radon as all counties in North Dakota are in the EPA Zone I.
- **Expansive/Unstable Soils.** New and future development should be directed to areas not prone or susceptible to expansive/unstable soils ensure vulnerabilities are reduced and/or eliminated.
- **Landslides.** New and future development should be directed to areas not prone or susceptible to landslides to ensure vulnerabilities are reduced and/or eliminated.
- **Meteorite Falls.** No known vulnerability to publicly-owned buildings and property.

- **Volcanic Hazards.** No known vulnerability to publicly-owned buildings and property.

### **Data Limitations**

The N.D. Geological Survey's landslide mapping identifies areas that have failed, which can be suggestive of an increased likelihood of future events. However, the landslide mapping completed-to-date is not predictive.

### **Other Key Documents**

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following documents.

- 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)
- Barnes County Commercial Animal Feed Operation Ordinance
- Barnes County Comprehensive Plan
- Barnes County Local Emergency Operations Plan
- Barnes County Threat and Hazard Identification and Risk Assessment (THIRA)
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan, Geologic Hazard Annex
- North Dakota Geological Survey 1:24,000 Landslide Area Map Series
- North Dakota State Disaster Recovery Plan
- North Dakota State Preparedness Report (SPR)
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

## 4.9 Hazardous Material Release

### Characteristics

Hazardous materials are any substance in any quantity or form that may pose an unreasonable risk to the safety, health, environment, and property of citizens. The term “hazardous material” covers a wide array of products, from relatively innocuous ones such as hair spray in aerosol dispensers and wash preservatives such as creosote to highly toxic or poisonous material such as polychlorinated biphenyl (PCB’s) and phosgene gas. The potential severity of hazards of these materials is varied but the primary reason for their designation is their risk to public safety. The Federal Motor Carrier Safety Administration has nine categories of hazardous materials that are:

- Explosives (Class 1)
- Gases (Class 2)
- Flammable and combustible liquids (Class 3)
- Flammable solids, spontaneously combustible, and dangerous when wet (Class 4)
- Oxidizing substances and organic peroxides (Class 5)
- Toxic/poisonous substances poison inhalation (Class 6)
- Radioactive materials (Class 7)
- Corrosive substances (Class 8)
- Miscellaneous hazardous materials/products, substances, or organisms (Class 9)

Hazardous material incidents can be categorized into two distinct groups – incidents of a transportation nature and those that occur at a stationary or fixed facility (Tier II).

<b>Seasonal Pattern</b>	None
<b>Duration</b>	Minutes/hours/days/weeks
<b>Speed of Onset</b>	No warning
<b>Location</b>	Along major transportation routes: Barnes County Municipal Airport, Tier II and agricultural and/or industrial storage sites, pipelines, railroads and roads: Interstate 94, U.S. Highway 52, N.D. Highways 1, 9, 18, 26, 32, 46, and local/township roads

For more information regarding hazardous material release please reference **2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)**. The state plan can be accessed by following the electronic hyperlink or link to the N.D. Dept. of Emergency Services website:

[2018 North Dakota Enhanced Mitigation Mission Area Operations Plan](#)

<https://www.des.nd.gov/planning>

### History

Information on the history of hazardous material release in Barnes County was provided by the 2018 N.D. Enhanced Mitigation MAOP, the N.D. Dept. of Health, Barnes County Emergency Management, and the National Pipeline Mapping System. Table 4.9.1 summarizes the history of pipeline incidents in Barnes County between 1998 and 2017. Table 4.9.2 summarizes the history of hazardous material release in



Barnes County from the N.D. Dept. of Health. A detailed hazard history for Barnes County can be found on a disc located at the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment. The following are key points.

2018 Enhanced Mitigation MAOP

Table 4.9.1 summarizes transmission pipelines incidents in Barnes County between 1998 and 2017.

**Table 4.9.1 – 1998 and 2017 Barnes County Transmission Pipeline Incidents**

Date	System Type	Fatalities	Injuries	Total Cost As Reported	Total Cost Current Year Dollars (2018)	Barrels Spilled	Net Barrels Lost
7/16/03	Hazardous Liquid	0	0	\$1,211,000	\$1,587,615	7,324	7,324
8/4/03	Hazardous Liquid	0	0	\$93,375	\$122,414	3,283	3,283
7/17/07	Hazardous Liquid	0	0	\$102,306	\$119,663	0	0
5/7/16	Hazardous Liquid	0	0	\$280,868	\$285,891	1	0

Source(s): 2018 Enhanced Mitigation MAOP

N.D. Dept. of Health

- According to the N.D. Dept of Health, a total of 63 releases/spills were reported in Barnes County between 1975 and 2020 discharging a total of 37,073.00 gallons of hazardous materials resulting in a frequency of approximately one and-a-half releases/spills annually. The size of each release ranged from one gallon of boring fluids to 6,600 gallons of diesel fuel. The average release size was 756.59 gallons.

Barnes County Emergency Management

- A family of four was displaced after an explosion and subsequent fire destroyed their house and many of their belongings Wednesday night, Feb. 26, 2020. Neighbors who witnessed the explosion, which occurred around 9 p.m., said the blast shook an apartment building across the street. The explosion sparked a fire, but the family was able to escape.

2018 Enhanced Mitigation MAOP

- The National Pipeline Mapping System website provides mapping services to illustrate where pipeline infrastructure geographically traverses political subdivisions. As shown in Figure 4.9.1, there have been four accidents involving hazard liquids on the Alliance/Enbridge pipeline.

**There have been no declared disasters or emergencies pertaining to hazardous material release in Barnes County.**

Table 4.9.2 – 1975 and 2020 Barnes County Hazardous Material Release History Summary

Incident ID	Date Reported	Date of Incident	County	TwnRngSec	Latitude	Longitude	Contaminant	Volume	Units	Contained
<a href="#">EIR361</a>	5/9/1979	5/8/1979	Barnes	14005828	46.91324	-98.00736	Diesel Fuel	150	gallons	
<a href="#">EIR310</a>	6/21/1983	6/20/1983	Barnes	13905728	46.82593	-97.88147	Diesel Fuel	6600	gallons	
<a href="#">EIR300</a>	6/13/1985	6/13/1985	Barnes	14305617	47.20351	-97.8011	Diesel fuel	400	gallons	
<a href="#">EIR299</a>	6/28/1985	6/27/1985	Barnes	14205621	47.10188	-97.77982	85-100 Asphalt Emulsion	6000	gallons	
<a href="#">EIR339</a>	7/12/1988	7/11/1988	Barnes	14005719	46.92751	-97.92315	Diesel fuel	800	gallons	
<a href="#">EIR121</a>	3/18/1991	3/18/1991	Barnes	14006015	46.94295	-98.23795	Diesel Fuel	5000	gallons	
<a href="#">EIR116</a>	7/2/1991	7/1/1991	Barnes	14005829	46.91327	-98.02842	Gasoline	1800	gallons	
<a href="#">EIR414</a>	9/27/1991	9/23/1991	Barnes	14005826	46.91307	-97.96499	Transformer Oil	1	gallons	
<a href="#">EIR161</a>	7/8/1992	7/7/1992	Barnes	14305617	47.20351	-97.8011	Hydraulic Fluid	100	gallons	
<a href="#">EIR164</a>	8/18/1992	8/18/1992	Barnes	14005618	46.9417	-97.79703	PEP Oil	4500	gallons	
<a href="#">EIR204</a>	3/21/1994	3/21/1994	Barnes	14305617	47.20351	-97.8011	HCL	600	gallons	
<a href="#">EIR35</a>	3/26/2001	3/22/2001	Barnes	13705930	46.65289	-98.17597	dielectric mineral oil with 13 ppm PCB conc.	800	gallons	
<a href="#">EIR48</a>	5/19/2001	5/19/2001	Barnes	14005822	46.92761	-97.98625	Unleaded gasoline	50	gallons	
<a href="#">EIR52</a>	5/25/2001	5/25/2001	Barnes	14106128	47.0013	-98.41473	Sonolan mix - 11 gal in 5-600 gal water.	550	gallons	
<a href="#">EIR55</a>	6/11/2001	6/9/2001	Barnes	13706025	46.65295	-98.19692	Diesel fuel	1000	gallons	
<a href="#">EIR72</a>	8/10/2001	8/8/2001	Barnes	13805705	46.79695	-97.90259	Transformer oil	4	gallons	
<a href="#">EIR74</a>	8/17/2001	8/17/2001	Barnes	14005631	46.89816	-97.79727	Non-PCB containing mineral oil	600	gallons	
<a href="#">EIR492</a>	12/4/2001	12/3/2001	Barnes	13705636	46.63726	-97.69245	Transformer Mineral oil	950	gallons	
<a href="#">EIR578</a>	1/3/2003	1/3/2003	Barnes	14005830	46.91341	-98.04917	diesel fuel	40	gallons	
<a href="#">EIR623</a>	8/5/2003	8/4/2003	Barnes	14005805	46.97176	-98.02835	Propane			
<a href="#">EIR849</a>	5/30/2006	5/29/2006	Barnes	14005720	46.92744	-97.90248	Antifreeze - Prestone	500	gallons	
<a href="#">EIR852</a>	6/2/2006	6/1/2006	Barnes	13905912	46.86817	-98.08067	Tordon & 24, D	15	gallons	
<a href="#">EIR862</a>	7/19/2006	7/19/2006	Barnes	14005700	46.93459	-97.87063	Roundup and Tiaga	100	gallons	
<a href="#">EIR881</a>	11/28/2006	11/28/2006	Barnes	14005926	46.91228	-98.00739	diesel fuel	50	gallons	
<a href="#">EIR989</a>	4/21/2008	4/21/2008	Barnes	14005821	46.924	-98	Hydraulic Fluid	10	gallons	
<a href="#">EIR1009</a>	5/23/2008	5/23/2008	Barnes	14005800	46.93493	-97.99677	Hydrolic Fluid	1	pounds	
<a href="#">EIR1014</a>	6/9/2008	6/8/2008	Barnes	14205931	47.07403	-98.20305	Powermax Roundup	75	gallons	
<a href="#">EIR1082</a>	11/25/2008	11/25/2008	Barnes	14205710	47.13146	-97.88626	Diesel Fuel	15	gallons	
<a href="#">EIR1237</a>	4/15/2010	4/15/2010	Barnes	14005827	46.91318	-97.98625	Heating Oil	25	gallons	
<a href="#">EIR1445</a>	6/1/2011	6/1/2011	Barnes	14005628	46.91274	-97.75542	Diesel Fuel	2	gallons	
<a href="#">EIR1509</a>	8/23/2011	8/23/2011	Barnes	13706025	46.65295	-98.19692	Dry Fertilizer			
<a href="#">EIR1667</a>	4/20/2012	4/19/2012	Barnes	13906010	46.87048	-98.2383	Urea Mez	1000	pounds	
<a href="#">EIR1696</a>	5/25/2012	5/24/2012	Barnes	13805618	46.76775	-97.79758	Hydraulic Oil	40	gallons	
<a href="#">EIR1707</a>	6/14/2012	5/31/2012	Barnes	13805625	46.73866	-97.69233	Hydraulic Oil	10	gallons	
<a href="#">EIR1930</a>	6/3/2013	6/2/2013	Barnes	14305813	47.2042	-97.97136	Non-PCB mineral oil	300	gallons	
<a href="#">EIR1940</a>	6/13/2013	6/11/2013	Barnes	14006014	46.93743	-98.22328	Approximately 1000 gallons of Aqua Ammonia or 800-1000 Lbs of Anhydrous Ammonia liquid	1000	gallons	

Source(s): N.D. Dept. of Health

Table 4.9.2 – 1975 to 2020 Barnes County Hazardous Material Release History Summary – Continued

Incident ID	Date Reported	Date of Incident	County	TwnRngSec	Latitude	Longitude	Contaminant	Volume	Units	Contained
<a href="#">EIR1972</a>	7/5/2013	7/5/2013	Barnes	14005822	46.92761	-97.98625	A pallet of lead batteries was dropped, breaking the cases and releasing Acid. Acid was soaked with floor dri	1	barrels	
<a href="#">EIR2035</a>	9/4/2013	9/4/2013	Barnes	14206124	47.10284	-98.35106	Non-polychlorinated biphenyls (PCB's) mineral Oil	10	gallons	
<a href="#">EIR2166</a>	1/7/2014	1/7/2014	Barnes	14005827	46.9073	-97.9758	transformer oil, non-pcb,cas # 64742-53-6	100	gallons	
<a href="#">EIR3278</a>	4/3/2014	3/19/2014	Barnes	13905727	46.82155	-97.86309	Anhydrous Ammonia	298	pounds	Yes
<a href="#">EIR3289</a>	4/16/2014	4/6/2014	Barnes	14005828	46.91208	-98.009	yellow corn syrup	4000	gallons	Yes
<a href="#">EIR3514</a>	10/23/2014	10/23/2014	Barnes	14005821	46.92253	-98.01373	Diesel Fuel	15	gallons	Yes
<a href="#">EIR3708</a>	4/1/2015	3/31/2015	Barnes	14205912	48.18373	-103.35356	boring fluids (drilling mud)	1	gallons	Yes
<a href="#">EIR3786</a>	6/25/2015	6/24/2015	Barnes	14305715	47.19796	-97.89437	Mineral oil from padmount transformer			Yes
<a href="#">EIR3864</a>	8/14/2015	8/14/2015	Barnes	14005830	46.90736	-98.04341	waste oil	2	gallons	Yes
<a href="#">EIR3992</a>	12/31/2015	12/31/2015	Barnes	14005828	46.91264	-98.0117	Unleaded fuel	40	gallons	Yes
<a href="#">EIR4015</a>	2/4/2016	2/4/2016	Barnes	14005821	46.92221	-98.01458	Diesel fuel	30	gallons	Yes
<a href="#">EIR4090</a>	5/7/2016	5/7/2016	Barnes	14206024	47.1044	-98.22279	Condensate			Yes
<a href="#">EIR4088</a>	5/7/2016	5/7/2016	Barnes	14205928	47.09599	-98.16679	Condensate	62	gallons	Yes
<a href="#">EIR4132</a>	6/13/2016	6/12/2016	Barnes	13805618	46.76411	-97.78877	Transformer oil potentially containing PCBs	25	gallons	Yes
<a href="#">EIR5247</a>	10/4/2016	10/4/2016	Barnes	13905727	46.82156	-97.86309	Anhydrous Ammonia	650	pounds	No
<a href="#">EIR5395</a>	5/4/2017	5/2/2017	Barnes	14005827	46.91622	-97.98675	presence of odor during borings			Yes
<a href="#">EIR5403</a>	5/11/2017	5/11/2017	Barnes	14006014	46.94051	-98.22523	NH3 vapors			No
<a href="#">EIR5438</a>	6/21/2017	6/22/2017	Barnes	13905625	46.83293	-97.68172	Clear Diesel #2	5	gallons	No
<a href="#">EIR5497</a>	8/28/2017	8/28/2017	Barnes	13905806	46.89108	-98.03951	transformer mineral oil			No
<a href="#">EIR5644</a>	2/26/2018	2/22/2018	Barnes	14105733	46.97957	-97.90388	Transformer Mineral Oil	9	gallons	Yes
<a href="#">EIR5645</a>	2/26/2018	2/22/2018	Barnes	14105733	46.97957	-97.90388	Transformer Mineral Oil	9	gallons	Yes
<a href="#">EIR5861</a>	9/24/2018	9/24/2018	Barnes	14105708	47.03711	-97.92398	NA 1993 Clear diesel fuel	30	gallons	Yes
<a href="#">EIR5885</a>	10/18/2018	10/12/2018	Barnes	14006027	46.9068	-98.24091	xylene based flammable liquid and diesel fuel			Yes
<a href="#">EIR8151</a>	7/11/2019	7/9/2019	Barnes	14006025	46.91878	-98.19583	Hydraulic Oil			Yes
<a href="#">EIR9219</a>	9/5/2019	9/2/2019	Barnes	14105809	47.05121	-98.04368	Transformer mineral oil, non-PCB per manufacture stamp on transformer	10	pounds	Yes
<a href="#">EIR9467</a>	5/11/2020	5/10/2020	Barnes	14005829	46.90602	-98.03655	Diesel Fuel	100	gallons	Yes
<a href="#">EIR10592</a>	10/14/2020	10/14/2020	Barnes	14105709	47.04981	-97.91323	Mineral Oil	250	gallons	Yes
<b>TOTAL</b>								<b>37,073.00</b>	<b>Gallons</b>	

Source(s): N.D. Dept. of Health

## Probability

The probability of a hazard or threat is how likely it is it will happen. Per Table 4.9.1, the probability of a hazardous material release involving a pipeline is one incident every five years. Per Table 4.9.2, the probability of hazardous material release in Barnes County is approximately one and-a-half releases/spills annually based on 63 occurrences between 1975 and 2020.

According to profile meeting participants, one-to-two minor occurrences of leaking anhydrous tanks are reported annually in Barnes County.

Continued/new industrial development at Spiritwood Energy Park in neighboring Stutsman County and changes in transportation of hazardous materials through Barnes County will also increase the probability of the hazard. According to the 2018 N.D. Enhanced Mitigation MAOP, the number of BNSF rail cars transportation crude oil through Barnes County peaked at 300 in 2015 and declined to 18 in 2018. Barnes County is ranked high for probability of a hazardous material release.

Profile meeting participants also indicated the probability of a hazardous material release highly likely, meaning that there is a 100 percent probability in the next year of an occurrence.

The following are key points regarding hazardous material release probability in Barnes County:

- **Airports.** Hazardous materials are transported via plane to and from Barnes County using the Barnes County Municipal Airport and private landing strips. There are no reported incidents of a plane crash carrying hazardous materials in Barnes County.
- **Fixed Facilities (Tier II and Extremely Hazardous Substance).**

Tier II. Tier II refers to facilities covered by the Emergency Planning and Community Right-to-Know Act (EPCRA). These facilities are required to maintain a material safety data sheet and submit an inventory of chemicals used to their Local Emergency Plan Update Committee (LEPC), the state emergency response commission and local fire departments each year. **Per the 2018 N.D. Enhanced Mitigation MAOP, Barnes County has 59 Tier II Sites. However, according to Barnes County Emergency Management, Barnes County has 67 Tier II Sites. The county also has seven anhydrous ammonia facility locations.**

A lot of anhydrous operations have closed in Barnes County in the last five years due to new federal requirements and the business no longer being cost-effective.

- **Pipelines.** According to the 2018 N.D. Enhanced Mitigation MAOP, there are 93.86 miles of gas transmission pipelines and 145.96 miles of hazardous liquid pipelines traversing Barnes County comprising 3.31 percent of the total in the state.

**Figures 4.9.1, 4.9.2, and 4.9.3 illustrate pipelines in Barnes County, crude oil pipelines in the state of North Dakota and Barnes County, and natural gas pipelines in the state of North Dakota and Barnes County, respectively.**

- **Rail.** BNSF Railway and CP Railway operate railroad facilities in the city of Valley City and other incorporated communities in Barnes County.
- **Road.** It is unknown if the reported incidents in Table 4.9.1 were the result of a transportation accident or a leak from a storage site. The N.D. Dept. of Health provided the data but did not specify the cause of each release. However, according to Barnes County Emergency Management and profile meeting participants, releases/spills do occur from road transportation incidents. Interstate 94, U.S. Highway 52 and N.D. Highways 1, 9, 26, 32, and 46 are highways where large quantities of hazardous materials are transported.

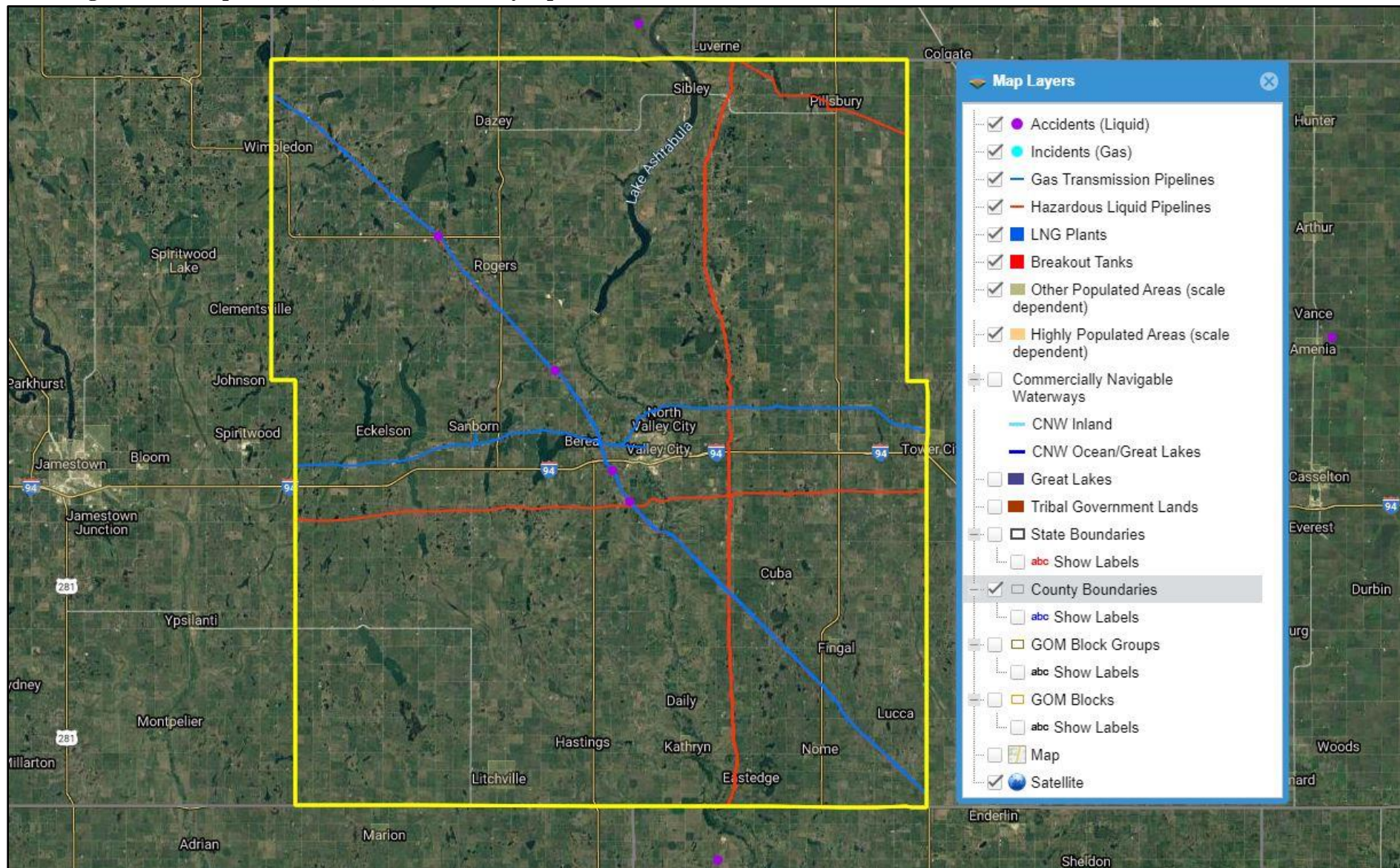
### Extent/Magnitude

The extent/magnitude of a hazard or threat is expressed in the amount and/or number of damages or losses either actualized in a community or estimated based on known assets and levels of risk. The extent/magnitude of a hazardous material release can vary from minimal in localized incidents to catastrophic in situations of explosions or high wind. Releases when high winds are present may carry chemicals and material great distances and impact many people. With proposed industrial development at Spiritwood Energy Park in neighboring Stutsman County, in addition to continued truck and rail traffic carrying crude oil and hazardous chemicals through Barnes County, the extent/magnitude of a hazardous material release incident is expected to remain constant and/or increase over the next five years.

- Per Table 4.9.2, the largest reported spill/release was 6,600 gallons of diesel fuel on June 20, 1983, followed by 6,000 gallons of asphalt emulsion on June 27, 1985. Planning for the extent/magnitude of hazardous material releases is difficult to determine as reporting history lacks the cause for the leak/spill in most cases. However, any type of release/spill in rural areas of the county could pose a challenge to smaller emergency services.
- **Per the 2018 N.D. Enhanced Mitigation MAOP, the number of trains carrying 1,000,000 gallons of crude oil (BNSF Railway) reached 300 per year in 2015 and declined to 18 annually by 2018 in Barnes County. Similarly, the state plan also indicated that the number of CP Railway trains carrying 1,000,000 gallons of crude oil reached 16 in 2014 and declined to eight by 2018 in Barnes County. The state plan also ranked hazardous material release as high for Barnes County.**

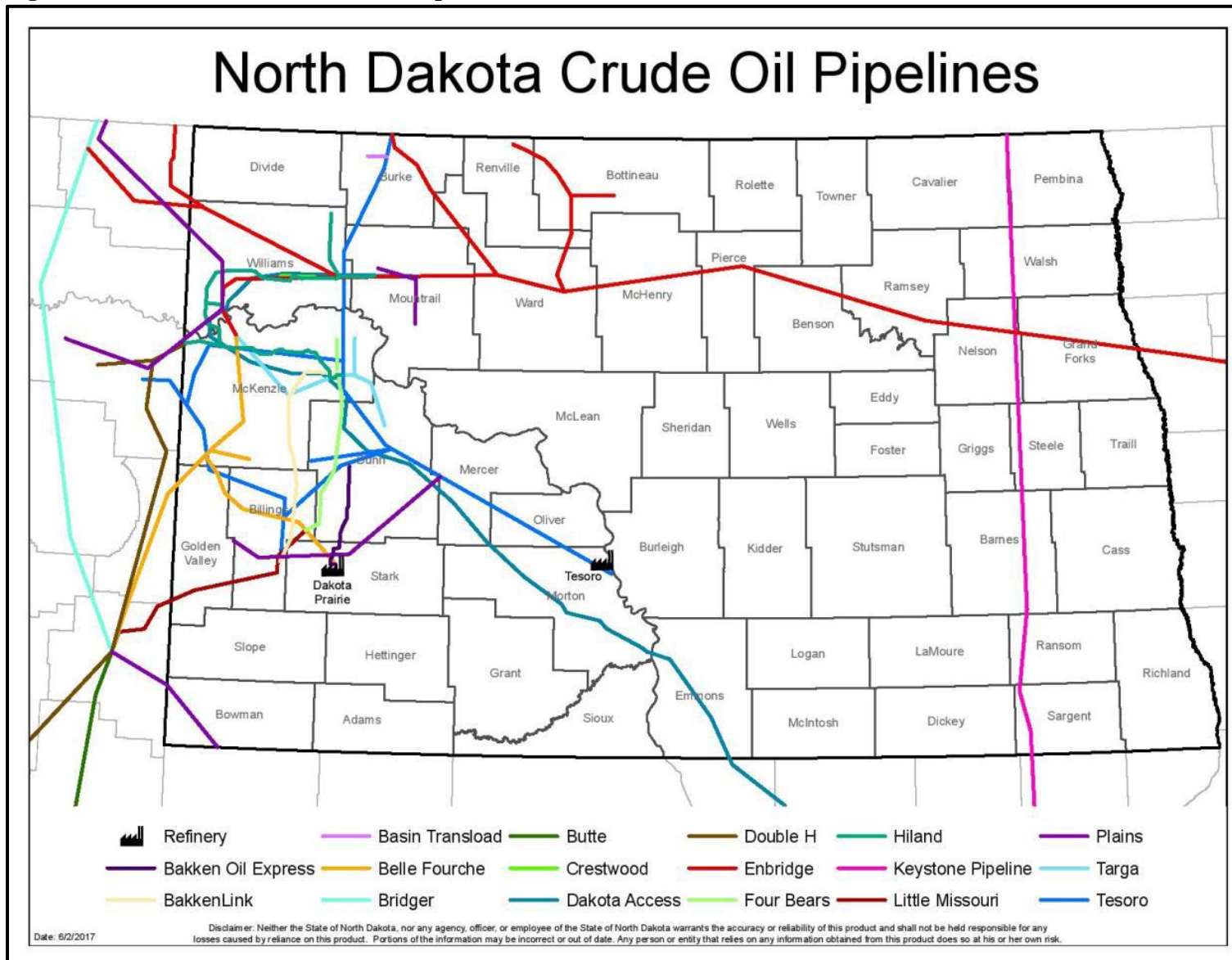
Profile meeting participants indicated the extent/magnitude or impact of a hazardous material release as catastrophic meaning more than 50 percent of the county, its people and property could be affected.

Figure 4.9.1 – September 1, 2020, Barnes County Pipelines



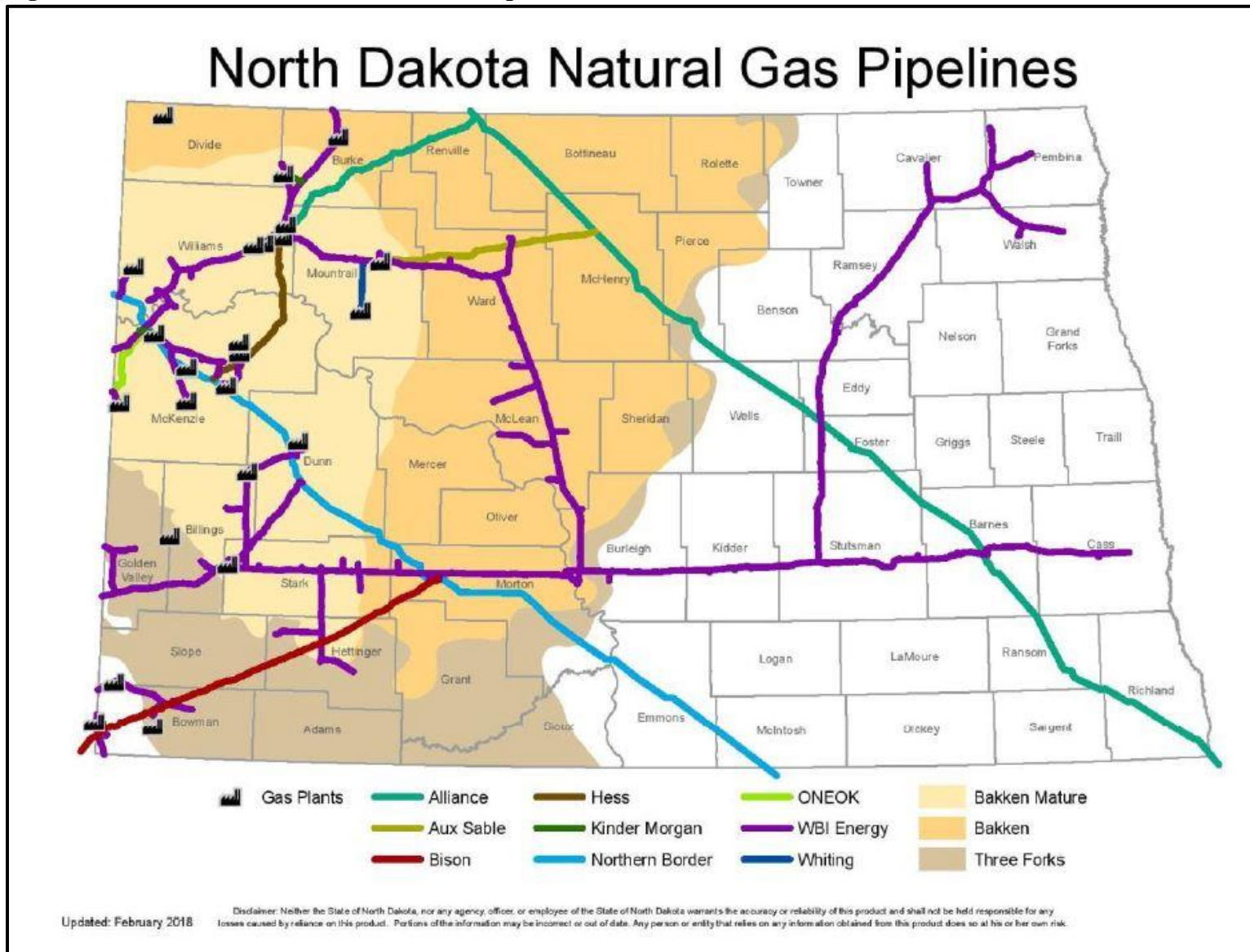
Source(s): National Pipeline Mapping System

Figure 4.9.2 -- North Dakota Crude Oil Pipelines



Source(s): 2018 N.D. Enhanced Mitigation MAOP

Figure 4.9.3 – 2018 North Dakota Natural Gas Pipelines



Source(s): 2018 N.D. Enhanced Mitigation MAOP



## Risk Assessment

Table 4.9.3 shows the risk assessment as determined by individual jurisdictions, the Steering Committee, and meeting participants at the profile meeting for hazardous material release. The risk assessment methodology can be found in the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA). The total in Table 4.9.2 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard/threat less the jurisdiction's capabilities to respond to the hazard/threat.

**Table 4.9.3 – Barnes County Hazardous Material Release Risk Assessment Scored Chart Summary**

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	4	4	4	4	2	<b>14</b>
Dazey	4	2	3	3	1	<b>11</b>
Fingal	4	3	4	4	1	<b>14</b>
Kathryn	2	2	2	2	1	<b>7</b>
Leal	4	2	4	4	1	<b>13</b>
Litchville	3	2	1	2	3	<b>5</b>
Nome	4	1	2	3	1	<b>9</b>
Oriska	4	1	4	4	1	<b>12</b>
Pillsbury	4	2	4	3	1	<b>12</b>
Rogers	4	2	3	1	1	<b>9</b>
Sanborn	4	2	4	4	1	<b>13</b>
Sibley	4	2	1	2	1	<b>8</b>
Valley City	4	2	3	4	1	<b>12</b>
Wimbledon	4	2	4	4	2	<b>12</b>

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 4.9.4 provides information on the specific impact, frequency, likelihood, vulnerability and capability of hazardous material release in Barnes County. A list of impacts identified as commonplace for natural hazards and man-made threats regardless of the jurisdiction is shown in Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA).

### Vulnerabilities to Publicly-Owned Buildings and Property

All publicly-owned buildings and property are at risk to hazardous material release as this type of hazard/threat can occur anywhere at any given time for a multitude of reasons. Buildings and property located near or adjacent to transportation modes, such as highways, railroads or airports are more at risk as the hazard/threat typically occurs during transportation of hazardous materials. In the city of Valley City, the Barnes County Courthouse, Valley City City Hall, Valley City Police Department, Valley City Fire Department Fire Hall and public schools are located beneath the BNSF railroad Hi-Line Bridge that traverses the Sheyenne River Valley at Valley City is vulnerable to a hazardous material release.

If facilities are located near fixed hazardous material sites (Tier II), such as propane or anhydrous ammonia tanks, the risk is increased as the source for the hazard/threat will always be present. If an explosion were to occur, buildings and properties located nearby could experience moderate to severe

damage and contamination, depending on the intensity and duration of the release. A summary of publicly-owned buildings is provided in Chapter 3, Profile and Inventory.

### **Vulnerabilities of Critical Facilities and Infrastructure**

Like publicly-owned buildings and property, the vulnerability of the hazard to critical facilities and infrastructure depends largely on location. Critical facilities and infrastructure located near transportation arteries or hazardous material storage sites are most at risk. Depending on the facility or infrastructure, impact could range from moderate to severe. Water infrastructure could become contaminated and threaten public health. Critical facilities such as hospitals could be shut down temporarily or indefinitely. If a release were to occur on a major roadway, emergency services would be limited and response times could be increased.

On December 30, 2013, BNSF oil train collided with a derailed train near Casselton spilling 400,000 gallons of crude oil. The collision ignited the crude oil and triggered a chain of explosions. A fireball and massive cloud of black smoke prompted a voluntary evacuation of 65% of the 2,300 residents living in Casselton and surrounding areas. This train traversed over the Hi-Line bridge in Valley City and if the incident occurred on the bridge, a catastrophic event would have ensued. In the city of Valley City, CHI-Mercy Hospital is located beneath the BNSF Hi-Line Bridge that traverses the Sheyenne River Valley at Valley City and is vulnerable to a hazardous material release. The city of Valley City obtains drinking/potable water from intakes between CHI-Mercy Hospital and the Rainbow Bridge and wells along the Sheyenne River. BNSF and CP Railway infrastructure is located adjacent to this infrastructure for the city and is vulnerable to any type of hazardous material release involving the railroad.

In addition, the fire hall for smaller incorporated jurisdictions is typically located near the railroad or highway and is vulnerable to hazardous material release.

### **Vulnerabilities to New and Future Development**

The vulnerability of new and future development depends largely on the type and density being proposed and where development is allowed. Residential development should be developed in areas away from hazardous material storage sites or major transportation arteries where chemicals are transported. If new development is already in progress, a development moratorium should be implemented to stop future growth or densities should be limited to reduce the number of people at risk.

Development in the industrial and agricultural sectors maintain demand for hazardous materials and are best situated near storage sites or transportation arteries to limit time spent in transit. Ultimately, hazardous materials should be prohibited from locating in residential or commercial areas, near hospitals, schools, or community gathering spaces. If already existing, plans should be put into place for relocation at a future time when funding permits or an appropriate alternative site becomes available. **This type of development should also be prohibited from being developed or located within 1,000 feet of a public school or facility with vulnerable populations such as daycares and care centers.** Industrial developments at Spiritwood Energy Park in neighboring Stutsman County would increase the number of hazardous materials being used and therefore shipped through Barnes County, which will increase the vulnerability to a hazardous material release.

**Table 4.9.4 – Barnes County Hazardous Material Release Risk Assessment**

<p><b>Impact</b></p>	<ul style="list-style-type: none"> <li>• Business Interruptions/Loss of Economy</li> <li>• Explosion</li> <li>• Environmental Degradation</li> <li>• Fuel Outage/Shortage</li> <li>• Human/Injury Death</li> <li>• Increased Public Safety Runs</li> <li>• Loss of Critical Facilities and Infrastructure</li> <li>• Loss/Overcrowded Medical Facilities</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Loss of Transportation Systems/Accessibility - Blocking of roads when emergency services response to incidents</b></li> <li>• <b>Leaking fuel tanks contaminate local waterways and potable water supplies (individual wells)</b></li> <li>• <b>School Closure</b></li> </ul>
<p><b>Frequency</b></p>	<ul style="list-style-type: none"> <li>• 63 releases/spills were reported in Barnes County between 1975 and 2020 discharging a total of 37,073.00 gallons of hazardous materials resulting in a frequency of approximately one and-a-half releases/spills annually.</li> </ul>	<ul style="list-style-type: none"> <li>• 6,600 gallons of diesel fuel spilled on June 20, 1983</li> <li>• 6,000 gallons of asphalt emulsion on June 27, 1985</li> </ul>
<p><b>Likelihood</b></p>	<p><u>More likely</u></p> <ul style="list-style-type: none"> <li>• Natural gas lines traversing the county – See Figure 4.9.3</li> <li>• Presence of Interstate 94, U.S. Highways 52, and numerous N.D. Highways</li> <li>• Presence of railroad infrastructure and airports</li> <li>• Agriculture economy with heavy use of chemicals</li> <li>• <b>Barnes County has 67 Tier II Sites. The county also has seven anhydrous ammonia facility locations.</b></li> <li>• <b>Shuttering of DAPL would result in increase of oil traffic on railroad infrastructure. Tier II reporting does not apply.</b></li> <li>• <b>Keystone Pipeline bisecting the county from north to south</b></li> </ul>	<p><u>Less likely</u></p> <ul style="list-style-type: none"> <li>• Tier II reporting and regulations (fixed facilities only)</li> <li>• <b>The number of annual trains carrying crude oil peaked at 98 in 2015 and declined to 12 by 2018 in Barnes County</b></li> </ul>
<p><b>Vulnerability</b></p>	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> <li>• Drinking/potable water intakes and wells for the city of Valley City, CHI Mercy Hospital, Valley City City Hall and Valley City Police Department located beneath the BNSF Hi-Line Bridge</li> <li>• <b>Keystone Pipeline bisecting the county from north to south</b></li> </ul>	<p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> <li>• Pipelines have SCADA systems</li> <li>• Railroads have emergency response personnel and equipment</li> </ul>

**Table 4.9.4 – Barnes County Hazardous Material Release Risk Assessment - Continued**

<p><b>Vulnerability</b></p>	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> <li>• Natural gas lines traversing the county – See Figure 4.9.3</li> <li>• Presence of Interstate 94, U.S. Highways 52/281, state highways</li> <li>• Presence of railroad infrastructure and airports</li> <li>• Agriculture economy with heavy use of chemicals</li> <li>• <b>Barnes County has 67 Tier II Sites. The county also has seven anhydrous ammonia facility locations.</b></li> <li>• <b>Shuttering of DAPL would result in increase of oil traffic on railroad infrastructure. Tier II reporting does not apply.</b></li> <li>• <b>Lack of truck routes in some incorporated jurisdictions</b></li> <li>• <b>Valley City drinking/potable water intakes and wells</b></li> <li>• <b>Increase in train speeds from 35 m.p.h. to 55 m.p.h. in 2015 over the Hi-Line Bridge</b></li> </ul>	<p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> <li>• Tier II reporting and regulations</li> <li>• City and county level ordinances regulating development and placement of hazardous materials</li> <li>• <b>Fire departments have frequent HAZMAT training</b></li> <li>• <b>BNSF made safety improvements to the Hi-Line Bridge in 2015 by replacing the track, painting the bridge, and refurbishing other components. These improvements allowed the train speeds to increase from 35 m.p.h. to 55 m.p.h.</b></li> </ul>
<p><b>Capability</b></p>	<p><u>Administrative and Technical</u></p> <ul style="list-style-type: none"> <li>• Contract for engineering, planning, and grant writing</li> <li>• Full-time emergency manager</li> <li>• County-wide mutual aid agreement for emergency services</li> <li>• Full-time county high superintendent and department staff</li> <li>• Full-time public works department in the city of Valley City</li> <li>• Barnes County Sheriff’s Office</li> <li>• Valley City Police Department</li> <li>• All county fire departments and ambulance services</li> <li>• City of Valley City has a full-time building code inspector</li> <li>• <b>Barnes County Everbridge</b></li> </ul> <p><u>Education and Outreach</u></p> <ul style="list-style-type: none"> <li>• Active emergency management department with education and outreach on county website and social media</li> <li>• Valley City Police Department and Fire Department have social media accounts</li> <li>• Education programs at local schools</li> </ul>	<p><u>Financial</u></p> <ul style="list-style-type: none"> <li>• EPCRA/Tier II Funding</li> <li>• Utilizes financial assistance from FEMA for federally declared disasters</li> </ul> <p><u>Planning and Regulatory</u></p> <ul style="list-style-type: none"> <li>• Maintains capital improvements project list and project funding sources</li> <li>• County truck regulatory officer regulating weight and size of trucks traversing county roads</li> <li>• County and city of Valley City has zoning and ordinances in place to regulate development</li> <li>• County and city of Valley City has adopted building codes and has flooding ordinances. County lacks building code enforcement officer. Some townships have building code enforcement.</li> <li>• NDDOT design criteria and regulation guidelines for construction of and improvements to roads</li> <li>• County and city have full-time zoning administrator</li> </ul>

### **Data Limitations**

The difficulty in understanding a hazardous material release is the lack of complete data reported on past releases. If any of the following information – location, time of day, wind speed/direction, temperature, humidity, method of release (transportation or facility failure), the amount of release and what material(s) are involved – is not reported, the ability to understand the true impact of the hazard/threat and develop mitigation strategies is limited. With numerous sources for potential release, whether from the agriculture sector, oil and gas sector, commercial and residential entities, or a combination from another hazard/threat such as a transportation accident, understanding how releases occur and identifying ways to mitigate this hazard proves impractical. Developing an inventory of hazardous materials from agriculture operations on the location and type of hazardous material being used, and what mode is being utilized for transportation, would assist in understanding the hazard.

### **Other Key Documents**

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following documents.

- 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)
- Barnes County Comprehensive Plan
- Barnes County Commercial Animal Feed Operation Ordinance
- Barnes County Evacuation and Shelter Plan
- Barnes County Local Emergency Operations Plan
- Barnes County Shelter and Mass Care Plan
- Barnes County Threat and Hazard Identification and Risk Assessment (THIRA)
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan, HAZMAT Annex
- North Dakota State Disaster Recovery Plan
- North Dakota State Preparedness Report (SPR)
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

## 4.10 Infectious Disease

Including animal, human, and plant diseases.

### Characteristics

Infectious disease is an illness that is caused by an infectious agent, such as bacteria, virus, fungi or parasites and/or toxic microorganisms and is transmittable from an infected animal, human or plant to another animal, human or plant.

<b>Seasonal Pattern</b>	<p><u>Animal.</u> Depends on the organism and current season.</p> <p><u>Human.</u> Depends on the organism and current season.</p> <p><u>Plant.</u> More susceptible in the summer as they are dormant in the winter, and year-round for plants grown indoors such as greenhouses.</p>
<b>Duration</b>	Hours/Days/Weeks/Months/Years
<b>Speed of Onset</b>	Hours to weeks (12 hours for most diseases)
<b>Location</b>	County-wide across all jurisdictions (incorporated and/or unincorporated)

For more information regarding infectious disease please reference the **2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)**. The state plan can be accessed by following the electronic hyperlink or link to the N.D. Dept. of Emergency Services website:

[2018 North Dakota Enhanced Mitigation Mission Area Operations Plan](#)

<https://www.des.nd.gov/planning>

### History

The history of infectious disease for animals, humans and plants is summarized for Barnes County in the following section. A detailed hazard history for Barnes County can be found on a disc located at the beginning of Chapter 4.

Animal - Rabies. According to the N.D. Dept. of Health, Barnes County has experienced 17 cases of rabies in animals between 2006 and 2020. Table 4.10.1 illustrates the history of rabies in Barnes County.

- Rabies was most prevalent in 2008 and 2014 with two cases in skunks each. One case was also reported in a skunk in 2007. In all, five cases of rabies were reported between 2006 and 2020.

Animal – Livestock. According to the Farm Services Agency (FSA), losses for livestock can be tracked by analyzing payments made under the Livestock Indemnity Program (LIP). However, the cause of the loss is not recorded. The FSA stated that disease is a likely contributor to losses occurring under LIP. Between 2013 and 2019, the following was paid to cover animal losses in Barnes County:

- 2013: \$12,944.00
- 2014: \$16,495.00
- 2015: \$0.00
- 2016: \$1,043.00
- 2017: \$0.00
- 2018: \$0.00
- 2019: \$31,221.00

**Table 4.10.1 – 2006 to 2020 Barnes County Rabies History**

Animal	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	TOTAL
Bat																0
Cat																0
Cow																0
Dog																0
Goat																0
Horse																0
Pig																0
Raccoon																0
Skunk		1	2						2							5
Sheep																0
<b>TOTAL</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>

Source: N.D. Dept. of Health

Human. A history of infectious disease in humans is shown in Tables 4.10.2 and 4.10.3 in Barnes County. Table 4.10.2 shows the history of influenza by season, which defined as a primarily between the months of August 1 to July 31 of any given year from 2010 to 2020. Table 4.10.3 shows the history of infectious diseases in Barnes County between 2004 and 2020.

- On average, Barnes County records 56 cases of influenza annually. The 2019/2020 flu season had the highest number of reported cases at 189 followed by the 2014/2015 flu season where 103 cases were reported.
- Aside from influenza, Barnes County recorded 751 infectious disease cases between 2004 and 2020, or roughly 44 cases per year.
- Between 2004 and 2020, Barnes County recorded 451 cases of Chlamydia, 115 cases of Hepatitis C Chronic, 49 cases of Gonorrhea, and 29 cases of Campylobacteriosis representing 60.1 percent, 15.3 percent, 6.5 percent, and 3.9 percent of reported infectious diseases, respectively.
- According to City-County Health, since 2015 there has been a significant increase in cases of Hepatitis C.
- Between 2016 and 2020, there were three cases of HIV/AIDS reported in Barnes County.

**Table 4.10.2 – 2010 to 2020 Barnes County Influenza History**

Infectious Disease	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
Influenza	18	21	35	23	103	13	88	11	56	189

Note: Each seasonal total includes cases recorded between August 1 to July 31 of any given year.

Source: N.D. Dept. of Health

Humans – COVID-19 Pandemic. Between June 1, 2020, and July 29, 2021, a total of 6,046 unique individuals were tested resulting in 1,455 positive cases and 32 deaths.

Table 4.10.3 – 2004 to 2020 Barnes County Infectious Disease History in Humans

Infectious Disease	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total by Disease
Babesiosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brucellosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Campylobacteriosis	1	0	3	1	0	1	1	2	0	2	1	3	4	2	2	2	4	29
Chickenpox	1	0	1	2	0	0	2	1	1	0	4	2	0	1	0	0	0	15
Chlamydia	48	20	18	30	45	18	12	17	18	14	30	32	21	29	21	40	38	451
Coccidioidomycosis	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Cryptosporidiosis	0	0	0	2	0	1	0	0	0	0	2	0	2	1	0	0	0	8
E.coli, shiga toxin-producing	0	0	1	1	1	0	0	0	0	0	0	1	2	0	0	0	0	6
Ehrlichiosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Giardiasis	0	1	2	0	0	1	0	1	0	0	0	0	0	2	1	1	0	9
Gonorrhea	6	3	2	1	0	1	1	0	0	2	2	0	1	2	5	10	13	49
Hepatitis A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis B Acute	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis B Chronic	0	0	0	0	1	0	1	0	0	0	1	0	1	0	0	1	0	5
Hepatitis C Acute	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hepatitis C Chronic	2	1	7	4	6	4	2	4	3	9	10	10	16	14	15	4	4	115
Legionellosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Listeriosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lyme Disease	0	0	0	0	0	1	1	0	0	0	1	0	1	0	0	1	1	6
Malaria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Measles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meningococcal meningitidis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mumps	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Pertussis	3	1	0	0	0	0	0	0	1	2	0	0	1	0	0	0	0	8
Q Fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rocky Mountain Spotted Fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rubella	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Salmonellosis	0	0	0	0	1	0	1	1	1	1	1	3	0	0	6	0	2	17
Shigellosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Syphilis	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0	4
Tetanus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trichinellosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuberculosis	0	0	0	0	0	0	0	0	1	0	0	1	2	0	0	0	0	4
Tularemia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Typhoid Fever (Salmonella Typhi)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Nile Virus	0	0	1	3	0	0	0	0	9	3	1	0	3	1	1	0	0	22
<b>TOTAL</b>	<b>61</b>	<b>26</b>	<b>36</b>	<b>44</b>	<b>54</b>	<b>27</b>	<b>21</b>	<b>26</b>	<b>34</b>	<b>33</b>	<b>53</b>	<b>52</b>	<b>55</b>	<b>54</b>	<b>52</b>	<b>61</b>	<b>62</b>	<b>751</b>

Source(s): State Epidemiologist, N.D. Dept. of Health



Humans –Tuberculosis. Cases of Tuberculosis have been recorded in Barnes County in 2012 (one), 2015 (one), and 2016 (two). Although not as common as in the past, the disease is still prevalent across North Dakota according to the N.D. Dept. of Health.

Plant. Crop loss from infectious disease is tracked by the U.S. Dept. of Agriculture, Risk Management Agency (RMA). The RMA provides data on the crop type affected, damage cause description, determined acres and indemnity amount. The damage description identifies the cause of damage, determines acres, identifies the number of acres lost due to damage, and the indemnity amount identifies the total amount of the loss for the designated peril. **The indemnity amount was not available prior to 2001. Between January 1, 2001, and December 31, 2020, Barnes County experienced 59 incidents of crop loss due to infectious disease impacting approximately 30,198.51 acres of crops totaling \$1,717,220.80 in losses.**

The NDSU Extension/Barnes County indicated that crop/plant losses occur annually and vary in severity.

### **Probability**

The probability of a hazard or threat is how likely it is it will happen. Jurisdictions with the highest animal and human populations, and crop exposure are at greatest risk of infectious disease occurrences.

Animal. Based on data from the Livestock Indemnity Program (LIP) and the assumption that all losses are disease-related, the probability of losses resulting from infectious disease in animals is \$8,814.71 in annual losses on average.

Meeting participants indicated the probability of infectious disease as likely meaning that there is a 50 percent probability in the next year of an occurrence.

Human. Per the infectious disease history for humans in Barnes County, the probability of infectious disease is 100 percent. Meeting participants indicated the probability of infectious disease as highly likely, meaning that there is a 100 percent chance in the next year of an occurrence.

Plant. Per the infectious disease history for plants in Barnes County, the probability of infectious disease in any given year is approximately 100 percent. Meeting participants indicated the probability of infectious disease in crops is 100 percent.

### **Extent/Magnitude**

The extent/magnitude of a hazard or threat is expressed in the amount of damage or losses either caused or could occur in a community. Jurisdictions with the highest animal and human populations, and crop exposure are at greatest risk to impacts from infectious disease occurrences.

Animal. With the lack of cause description and total number of animals lost in the data from the FSA, the extent/magnitude of animal loss from infectious disease cannot be determined.

- Meeting participants indicated that with the local rural economy heavily dependent on agriculture, significant animal losses could have a catastrophic impact.

- Figure 4.10.1 illustrates the cattle and calf inventory in North Dakota. Barnes County has 17,200 head as of 2018.
- A total of five cases of rabies were reported in Barnes County between 2006 and 2020. All five cases were reported in skunks.
- Meeting participants indicated that with the local economy heavily dependent on agriculture, significant animal losses may have a catastrophic impact.

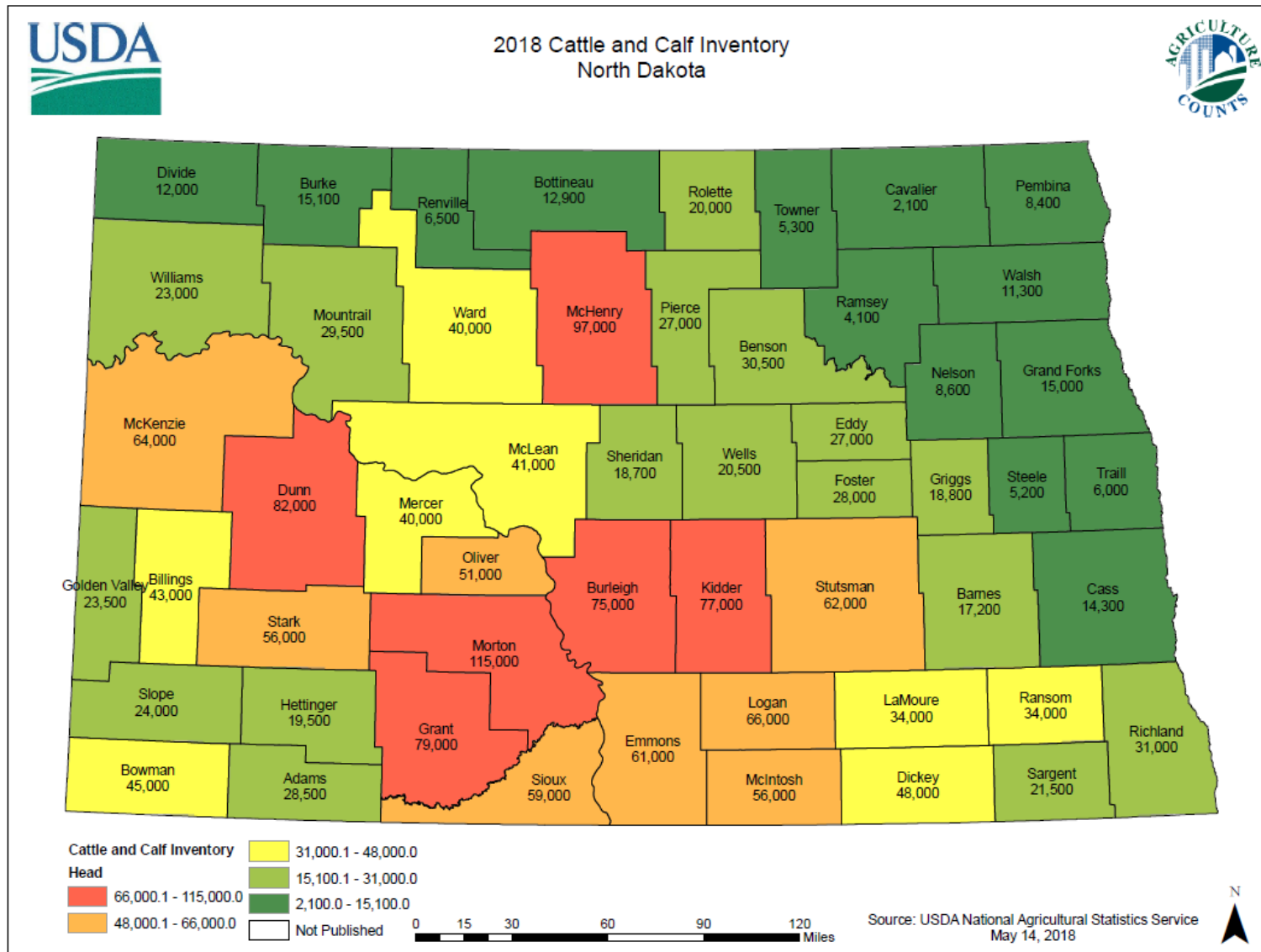
Human. The extent/magnitude of infectious disease for humans can range from low to high, depending on the disease involved, and the specific location of occurrence. If an outbreak occurred in a remote area where there is a shortage of health professionals, the extent/magnitude could be catastrophic. Figure 4.10.2 shows the areas in North Dakota that have a shortage of health professionals. The northernmost third of Barnes County is designated as a Health Professionals Shortage Area (HPSA).

- According to City-County Health, if a pandemic from a new strain of Influenza or Avian Flu occurred in Barnes County, the impact could be catastrophic, like the COVID-19 Pandemic. The COVID-19 pandemic resulted in 32 fatalities in Barnes County. The total economic losses from the pandemic are still unknown but are estimated to be in the hundreds-of-thousands to millions of dollars in Barnes County. Approximately 13.4 percent of Barnes County residents contracted the disease.
- Influenza is an infectious disease that is common-place and the extent/magnitude is managed by modern medical advances. However, the jet-age has contributed to faster spread of disease. With the re-emergence of Ebola and the onset of COVID-19, the extent/magnitude for infectious disease in humans has the potential to be catastrophic resulting from modern-day travel.
- Meeting participants indicated that infectious disease in humans can have a catastrophic impact after what was experienced in Barnes County due to the COVID-19 Pandemic. The pandemic resulted in a near total shut down of local economic and human activity.
- **The extent/magnitude of disease could be unanticipated to Barnes County as unknown vectors are moving north due to climatic change.**

Plant. Per crop loss data from the RMA the following statistics illustrate the extent/magnitude of infectious diseases on crops in Barnes County.

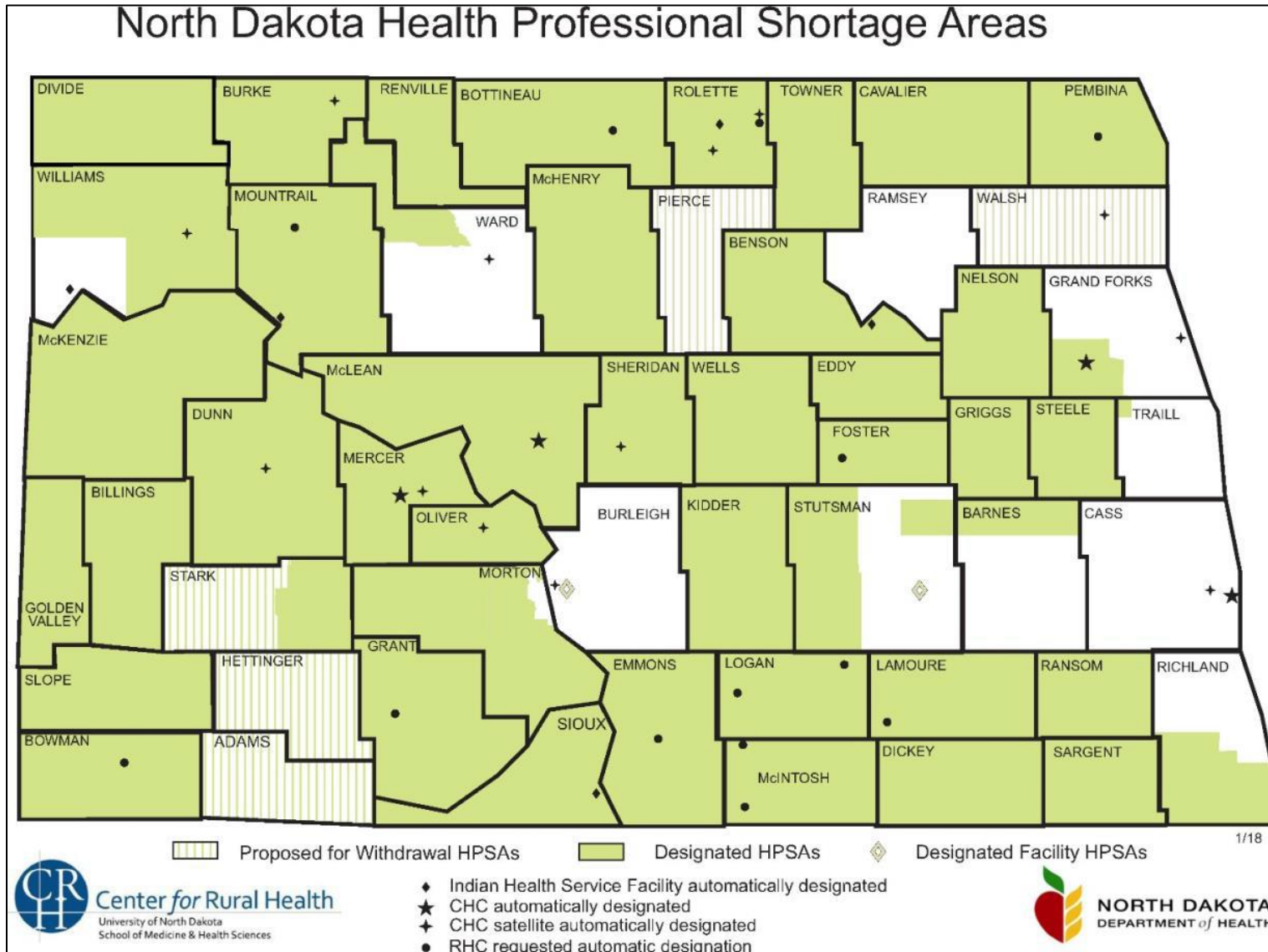
- There were 46 incidents of crop loss due to infectious disease between January 1, 2001, and December 31, 2020, resulting approximately two and-a-half occurrences of crop loss annually.
- On average, crop losses from infectious disease impacts 1,166.20 acres per year resulting in an average of \$60,243.69 in crop losses annually.
- Meeting participants indicated that with the local economy heavily dependent on agriculture, significant crop losses may have a catastrophic impact.

Figure 4.10.1 – 2018 North Dakota Cattle and Calf Inventory



Source(s): 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP); USDA National Agricultural Statistics Service, 2018

Figure 4.10.2 – North Dakota Health Professional Shortage Areas



Source(s): 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP); Center for Rural Health, University of North Dakota School of Medicine and Health Sciences, 2018

## Risk Assessment

Table 4.10.4 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for infectious disease. The risk assessment methodology can be found in the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment. The total in Table 4.10.4 represents the sum of each jurisdiction's impact, frequency, likelihood, and vulnerability to a hazard less the jurisdiction's capabilities to respond to the hazard.

**Table 4.10.4 – Barnes County Infectious Disease Risk Assessment Scored Chart Summary**

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County – Human	4	4	4	3	2	<b>13</b>
Barnes County – Animal & Plant	4	4	4	4	4	<b>12</b>
City of Dazey	2	2	3	3	2	<b>8</b>
City of Fingal	2	2	2	4	1	<b>9</b>
City of Kathryn	2	2	2	3	2	<b>7</b>
City of Leal	2	2	2	1	2	<b>5</b>
City of Litchville	1	2	2	1	3	<b>3</b>
City of Nome	1	2	1	3	1	<b>6</b>
City of Oriska	2	2	4	4	1	<b>11</b>
City of Pillsbury	1	2	2	3	1	<b>7</b>
City of Rogers	1	2	3	3	1	<b>8</b>
City of Sanborn	4	2	3	3	1	<b>11</b>
City of Sibley	4	2	2	3	1	<b>10</b>
City of Valley City	4	3	3	3	3	<b>10</b>
City of Wimbledon	4	2	3	2	2	<b>9</b>

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Tables 4.10.5, 4.10.6, and 4.10.7 provide information on the specific impact, frequency, likelihood, vulnerability, and capability of infectious disease in Barnes County in animals, humans and plants, respectively. A list of impacts identified as commonplace for natural hazards and man-made threats regardless of the jurisdiction is shown at the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA).

**Table 4.10.5 – Barnes County Infectious Disease Risk Assessment - Animal**

<p><b>Impact</b></p>	<ul style="list-style-type: none"> <li>• Disease Outbreak/Mass Infections – (animals only)</li> <li>• Government Interruptions</li> <li>• Labor Shortages</li> <li>• Livestock Loss</li> <li>• Loss of Economy</li> <li>• Loss/Overcrowded Veterinarian Facilities</li> <li>• Loss of Drinking/Potable Water</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Strain on local veterinarian resources</b></li> <li>• <b>Financial cost to local producers and the public</b></li> <li>• Lack of awareness of general public resulting from difficulties in communicating through media sources</li> <li>• Distress of local producers from a pandemic</li> <li>• Compression of supply chain can lead to supplies and vaccination shortages</li> <li>• <b>Carcass disposal</b></li> </ul>
<p><b>Frequency</b></p>	<ul style="list-style-type: none"> <li>• Animal losses due to infectious disease occur annually</li> <li>• A total of 17 cases of rabies were reported in Barnes County between 2006 and 2017.</li> <li>• <b>Five cases of Anthrax in 2005 and one in 2000</b></li> </ul>	
<p><b>Likelihood</b></p>	<p><u>More likely</u></p> <ul style="list-style-type: none"> <li>• 17,200 head of cattle &amp; calf in 2018 in the county</li> <li>• Agriculture economy</li> <li>• Dependent on weather for animals and crops</li> <li>• Transporting of animals across state lines</li> <li>• <b>N.D. Highway 1 = heavy livestock traffic</b></li> <li>• <b>Overuse of antibiotics leading to disease tolerance</b></li> <li>• <b>Interstate 94 – transportation of animals</b></li> </ul>	<p><u>Less likely</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public and private facilities, producers, etc.</li> <li>• <b>Impact is highly dependent on the type of disease and its effect on the population of livestock</b></li> </ul>
<p><b>Vulnerability</b></p>	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> <li>• 17,200 head of cattle &amp; calf in 2018 in the county</li> <li>• Agriculture economy</li> <li>• Transporting of animals across state lines</li> <li>• <b>N.D. Highway 1 = heavy livestock traffic</b></li> <li>• <b>Overuse of antibiotics leading to disease tolerance</b></li> <li>• <b>Interstate 94 – transportation of animals</b></li> <li>• <b>Shortage of veterinary service</b></li> <li>• <b>Cross contamination between producers</b></li> </ul>	<p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public and private facilities, producers, etc.</li> <li>• <b>Veterinarian clinics in the county help address the need for services, but does not meet overall demand</b></li> </ul>
<p><b>Capability</b></p>	<ul style="list-style-type: none"> <li>• See Chapter 7 for a list of capabilities to address infectious disease.</li> </ul>	

**Table 4.10.6 – Barnes County Infectious Disease Risk Assessment - Human**

<p><b>Impact</b></p>	<ul style="list-style-type: none"> <li>• Human Injury/Death</li> <li>• Loss of Economy (crop, livestock, manufacturing, etc.)</li> <li>• Loss/Overcrowded Medical Facilities</li> <li>• Mass Casualties/Fatalities</li> <li>• Loss of Potable Water</li> <li>• School Closure</li> <li>• Compression of supply chain can lead to shortages of supplies and vaccinations</li> <li>• Disruptions in essential services and critical infrastructure operations due to lack of alternative staff</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Financial cost to public health resources</b></li> <li>• <b>Infrastructure degradation resulting from labor shortages</b></li> <li>• <b>Mass casualties can overwhelm funeral homes and hospital’s morgue has limited space</b></li> <li>• <b>Labor shortages in medical facilities</b></li> <li>• <b>Psychological impacts to the public and medical community</b></li> <li>• <b>Loss confidence in local government</b></li> <li>• <b>COVID-19 resulted in 32 deaths as of August 2021</b></li> </ul>
<p><b>Frequency</b></p>	<ul style="list-style-type: none"> <li>• Annual occurrences of death, primarily among elderly</li> <li>• Occurrence of 1 in 3 for people annually</li> <li>• COVID-19 resulted in 32 fatalities</li> <li>• Approximately 13.4 percent of all county residents had confirmed cases of COVID-19</li> <li>• 752 infectious disease cases between 2004 and 2020 in Barnes County, or roughly 44 cases per year</li> </ul>	<ul style="list-style-type: none"> <li>• <b>According to CCH, 50 percent of current COVID cases are under the age of 50 as of August 25, 2021 in the State of North Dakota</b></li> <li>• Between 2004 and 2020, Barnes County recorded 451 cases of Chlamydia, 115 cases of Hepatitis C Chronic, 49 cases of Gonorrhea, and 29 cases of Campylobacteriosis representing 60.1 percent, 15.3 percent, 6.5 percent, and 3.9 percent of reported infectious diseases, respectively.</li> </ul>
<p><b>Likelihood</b></p>	<p><u>More likely</u></p> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Public schools and care centers</li> <li>• Increasing number of adults avoiding COVID-19 vaccinations for themselves and their children</li> <li>• Small increase in avoidance of vaccinating in general</li> <li>• <b>35 percent of people in Barnes County are classified as obese in 2021 – lack of physical activity</b></li> <li>• <b>Emergence of the COVID-19 variants</b></li> <li>• <b>Unvaccinated individuals are 5 times more likely to contract COVID compared to vaccinated individuals and 29 times more likely to be hospitalized</b></li> </ul>	<p><u>Less likely</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv promoting wellness and preventative measures – conducted through CCH and Barnes County</li> <li>• Public health and employment regulations for public and private facilities, producers, etc.</li> <li>• Immunizations &amp; medications</li> <li>• Low birth weight, food environment index (access to food), primary care physicians, children in poverty and single homes, violent crime, injury-caused deaths, and particulate air pollution contribute to negative health outcomes in Barnes County per the 2021 Community Health Assessment for Barnes County</li> </ul>

Table 4.10.6 – Barnes County Infectious Disease Risk Assessment – Human – CONTINUED

Vulnerability	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Increase in mobility and air travel</li> <li>• Shortage of health professionals in northernmost third of Barnes County</li> <li>• Unknown vectors moving north from climate change</li> <li>• <b>The prevalence of social media increasing skepticism of disease prevention measures</b></li> <li>• Public schools and care centers</li> <li>• <b>35 percent of people in Barnes County are classified as obese in 2021 – lack of physical activity</b></li> <li>• <b>N.D. State Legislature voted in 2021 that the State Health Officer cannot implement a mask mandate</b></li> <li>• <b>Emergence of the COVID-19 variants</b></li> <li>• <b>Barnes County Correctional Center</b></li> <li>• <b>Presence of 1,686 students at VCSU</b></li> <li>• <b>Delay of information sharing about disease trends to local public health from state department of health</b></li> <li>• <b>Lack of local epidemiologist providing specific disease statistics and reporting for Barnes County</b></li> <li>• <b>Lack of indoor mass vaccinating/testing facility</b></li> <li>• <b>CCH need an upgraded permanent backup generator</b></li> <li>• <b>Fluctuating funding levels from Barnes County Commission to City-County Health and economic development during times of public health need</b></li> <li>• <b>Lack of consistent information from Regional PIO</b></li> <li>• <b>Sharing of paraphernalia for by individuals who participate in recreational drug use has increased occurrences of Hepatitis C in Barnes County</b></li> </ul>	<p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv promoting wellness and preventative measures</li> <li>• Public health and employment regulations for public and private facilities, producers, etc.</li> <li>• Immunizations &amp; medications</li> <li>• The population density of the rural parts of Barnes County is sparse and the rural setting allows for immediate social distancing</li> <li>• <b>City-County Health</b></li> <li>• <b>Barnes County Ambulance</b></li> <li>• <b>CHI Mercy Hospital Valley City – has a permanent backup generator</b></li> <li>• <b>Adequate storage space and refrigeration units for stockpile of medical supplies at CCH – backup at Sanford Health Clinic</b></li> <li>• <b>Barnes County is ranked as having a low social vulnerability</b></li> <li>• <b>92 percent of long-term care residents have received COVID-19 vaccinations in Barnes County as of 2021</b></li> <li>• <b>N.D. Dept. of Health is statutorily responsible for disease outbreaks – local public health departments work under this direction by way of an MOU</b></li> <li>• <b>Regional state epidemiologists working with local public health to manage disease outbreaks</b></li> <li>• <b>Regional Public Information Officer (PIO)</b></li> <li>• <b>Regional Environmental Health Practitioner</b></li> <li>• <b>Regional Emergency Preparedness and Response Coordinator</b></li> </ul>
	Capability	<ul style="list-style-type: none"> <li>• See Chapter 7 for a list of capabilities to address infectious disease.</li> </ul>



Table 4.10.7 – Barnes County Infectious Disease Risk Assessment - Plant

<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Disease Outbreak/Mass Infections (plants only)</li> <li>• Livestock Loss</li> <li>• Loss of Economy</li> <li>• Soil Erosion</li> </ul>	<ul style="list-style-type: none"> <li>• Strain on local, state, and federal governments resources, and private enterprise</li> <li>• Between January 1, 2001, and December 31, 2020, Barnes County experienced 59 incidents of crop loss due to infectious disease impacting approximately 30,198.51 acres of crops totaling \$1,717,220.80 in losses.</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Crop loss due to infectious disease occurs annually</li> </ul>	<ul style="list-style-type: none"> <li>• Between January 1, 2001, and December 31, 2020, Barnes County averaged 1,509.93 acres of crops impacted by infectious disease totaling \$85,861.04 in losses.</li> </ul>
<b>Likelihood</b>	<p><u>More likely</u></p> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• Dependent on weather for animals and crops</li> </ul>	<p><u>Less likely</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public and private facilities, producers, etc.</li> <li>• Pesticide Training facilitated by NDSU Extension</li> </ul>
<b>Vulnerability</b>	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• Dependent on weather for animals and crops</li> </ul> <p><u>2017 US Census of Ag</u></p> <ul style="list-style-type: none"> <li>• 939 farms</li> <li>• \$286,065,000 in crop sales</li> <li>• \$49,560,000 in livestock sales – insert into animal section</li> </ul>	<p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> <li>• Pesticide Training facilitated by NDSU Extension</li> </ul>
<b>Capability</b>	<ul style="list-style-type: none"> <li>• See Chapter 7 for a list of capabilities to address infectious disease.</li> </ul>	

### **Vulnerabilities to Publicly-Owned Buildings and Property**

Most structures remain unaffected by impacts from infectious disease as only animals, humans and plants are susceptible to the hazard. Buildings can become contaminated and uninhabitable due to secondary impacts from a pandemic – i.e. people sheltering-in-place and inadvertently neglecting property. Also, critical facilities are not always available for vaccinations or testing due to competing community events/uses. An increase in disinfection measures, both staff-time and cost to local budgets, does occur during influenza season and during pandemics, such as COVID-19.

There are almost no physical vulnerabilities to publicly-owned buildings and property from infectious disease in animals and plants.

A summary of publicly-owned buildings is provided in Chapter 3, Profile and Inventory.

### **Vulnerabilities of Critical Facilities and Infrastructure**

Since animals, humans and plants are affected by infectious disease, critical facilities and infrastructure are relatively unaffected in structural terms. However, critical facilities such as public health, hospitals, and veterinarian clinics can become contaminated and/or quickly overwhelmed if an outbreak/pandemic of infectious disease occurs in animals or humans. **The surge to facilities and shortages or outages of medical supplies (personal protective equipment also known as PPE) and staff can limit or stop altogether the functionality of medical and veterinarian facilities and services.** The stress/strain infectious disease can place on the private sector (businesses or individuals) and public sector also impacts the vulnerability to critical facilities and infrastructure due to people sheltering-in-place resulting in shortages of labor.

Similarly, emergency services can also become stressed in rural areas where populations are dispersed over a large geographic expanse. The vulnerability and exposure to infectious disease is likely to increase due to greater frequency of emerging diseases, increased mobility (primarily jet travel), an aging population, and anti-vaccination trends.

Infrastructure for drinking/potable water could be impacted by infectious disease through contamination, or through quarantine of a large portion of a given population that could delay physical maintenance and/or repair to infrastructure.

Due to presence of the livestock industry in Barnes County, veterinary services can also become overwhelmed in the case of an outbreak in farm animals and livestock.

There are almost no physical vulnerabilities to critical facilities and infrastructure from infectious disease in animals and plants.

### **Vulnerabilities to New and Future Development**

New development would largely avoid physical impact from infectious disease and not be vulnerable. While mold may make a building uninhabitable, it is not an infectious disease. However, new structures could be susceptible to deterioration from contamination if structures are not constructed properly. In addition, if drainage in new development is not designed properly or not installed altogether, the standing water could foster vector growth.

There are almost no physical vulnerabilities to new and future development from infectious disease in animals and plants.

**Population growth or decline, attributable to new and future development, will either increase or decrease the vulnerability to infectious disease. Similarly, population growth in livestock could increase or decrease the vulnerability to infectious disease.**

### Data Limitations

#### Animal

The lack of available animal loss data from the N.D. Dept. of Agriculture results in the inability to track livestock losses from infectious disease. Similarly, the Farm Services Agency (FSA) provided information on payments made through the Livestock Indemnity Program, but the cause of the loss and the number of animals impacted is not available.

Statistics on infectious disease in animals available on the N.D. Dept. of Health website cannot be downloaded and must manually compiled and analyzed. Statistics on rabies and all other diseases are fragmented on the website, being available in separate sections throughout.

#### Human

Statistics on infectious disease in humans available on the N.D. Dept. of Health website cannot be downloaded and must manually compiled and analyzed. Statistics on influenza are shown in a separate section on the department's website from all other infectious diseases impacting humans.

**The delay of information sharing about disease trends and statistics from the N.D. Dept. of Health to local public health units causes disruption in delivery of services and reduces mitigation capability.**

#### Plant

The U.S. Dept. of Agriculture-Risk Management Agency is not able to provide monetary crop loss information prior to 2001.

### Other Key Documents

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following documents.

- 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)
- Barnes County Local Emergency Operations Plan
- Barnes County Threat and Hazard Identification and Risk Assessment (THIRA)
- Centers for Disease Control Social Vulnerability Index, Barnes County, North Dakota
- City-County Health District Shelter and Mass Evacuation Plan
- City-County Health District Point of Dispensing Plan (POD)
- City-County Health District Pandemic Influenza Response Plan

- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan, Infectious Disease Annex
- North Dakota State Disaster Recovery Plan
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

## 4.11 Severe Summer Weather

Including downbursts, extreme heat, hail, high wind, lightning, and tornadoes.

### Characteristics

Summer storms are caused by atmospheric temperature imbalances. Thunderstorms develop as warm, moist air rises. These conditions will produce updraft and downdrafts that can reach velocities of 170 mph. Updrafts and downdrafts are the reason for gust fronts, heavy rain (flash severe summer weather), lightning, hail, and high winds. Downburst or straight-line winds can be as deadly as tornadoes. If a thunderstorm continues to intensify, a tornado may develop. A thunderstorm affects a relatively small area when compared to a winter storm. The typical thunderstorm is 15 miles in diameter and lasts an average of 30 minutes. Despite their small size, all thunderstorms are dangerous. Severe summer storms can result in loss of life, injuries, and damage to property and crops.

<b>Seasonal Pattern</b>	March to November
<b>Duration</b>	2 to 6 hours
<b>Speed of Onset</b>	12 to 24 hours warning
<b>Location</b>	Total geographic extent of Barnes County

**Downbursts:** Strong winds can form along the leading edge of a thunderstorm. Downburst winds occur when air is carried into a storm's updraft, cools rapidly, and comes rushing to the ground. These winds are forced horizontally when they reach the ground and can cause significant damage. These types of strong winds can also be referred to as straight-line winds.

**Extreme Heat:** According to information provided by FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities.

**Hail:** Hail is frozen precipitation that forms and falls from cumulonimbus clouds. Hail occurs when strong rising currents of air within a storm, called updrafts, carry water droplets to a height where freezing occurs. The ice particles grow, finally becoming too heavy to be supported by the updraft and fall to the ground.

**High wind:** High wind events occur separately from tornadoes and severe thunderstorms. These winds typically develop with strong pressure gradients and gusty frontal passages. The closer and stronger two systems are, (one high pressure, one low pressure) the stronger the pressure gradient, and therefore, the stronger the winds are.

**Lightning:** Lightning develops when ice particles in a cloud move around, colliding with other particles. These collisions cause a separation of electrical charges. Positively charged ice particles rise to the top of the cloud and negatively charged ones fall to the middle and lower sections of the cloud. The negative charges at the base of the cloud attract positive charges at the surface of the Earth.

**Tornado:** A tornado is a violently rotating column of air extending from a thunderstorm to the ground. Most tornadoes develop from supercell thunderstorms. Supercell thunderstorms have a persistent rotating updraft and can form when there is sufficient vertical wind shear in the atmosphere. A funnel cloud is a

rotating column of air extending out of a cloud base, but not yet touching the ground. Once a funnel cloud reaches the ground, it becomes a tornado. Tornadoes can create tremendous damage over a small area.

For more information regarding severe summer weather please reference the **2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)**. The state plan can be accessed by following the electronic hyperlink or link to the N.D. Dept. of Emergency Services website:

[2018 North Dakota Enhanced Mitigation Mission Area Operations Plan](#)

<https://www.des.nd.gov/planning>

**History**

Information on the history of severe summer weather in Barnes County was obtained from the National Climatic Data Center (NCDC); the National Oceanic and Atmospheric Administration (NOAA); the USDA, Risk Management Agency; and Barnes County Emergency Management. A detailed hazard history for Barnes County can be found on a disc located at the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment.

National Climatic Data Center/National Oceanic and Atmospheric Administration

Table 4.11.1 summarizes the history of severe summer weather in Barnes County between January 1, 1950, to December 31, 2020. The following are key points.

- Barnes County experienced 577 occurrences of severe summer weather resulting in approximately seven storms of significance annually.
- Approximately \$9,308,250.00 in property damage and \$13,063,00.00 in crop damage was reported.
- One injury and no fatalities were reported.

**Table 4.11.1 – 1950 to 2020 Barnes County Severe Summer Weather Hazard History Summary**

Severe Summer Weather				
Occurrences	Injuries	Fatalities	Property Damage	Crop Damage
577	1	0	\$9,308,250.00	\$13,063,000.00

Source(s): National Climatic Data Center (NCDC); National Oceanic and Atmospheric Administration (NOAA)

U.S. Dept. of Agriculture, Risk Management Agency

Crop loss from severe summer weather is tracked by the U.S. Dept. of Agriculture, Risk Management Agency (RMA). The RMA provides data on the crop type affected, damage cause description, determined acres and indemnity amount. The damage description identifies the cause of damage, determines acres identifies the number of acres lost due to damage, and the indemnity amount identifies the total amount of the loss for the designated peril. Cause of Loss categories included in severe summer weather include cold wet weather, excess moisture/precip/rain, hail, heat, hot wind, and wind/excess wind. **Between January 1, 2001, and December 31, 2020, Barnes County experienced 1,714**

**incidents of crop loss due to severe summer weather impacting approximately 2,139,321.87 acres of crops totaling \$308,228,515.38 in losses.**

**There have been disaster declarations and emergencies pertaining to a severe summer weather in Barnes County.**

### **Probability**

The probability of a hazard or threat is how likely it is it will happen. Per Table 4.11.1, the following statistics on the probability of severe summer weather in Barnes County is as follows.

- The probability of severe summer weather is 100 percent based on 577 occurrences between January 1, 1950, and December 31, 2020, or eight severe summer weather events of significance annually.
- Barnes County experiences approximately \$131,102.11 in property damage and \$183,985.92 in crop damage annually between January 1, 1950, and December 31, 2020.
- Approximately one injury and no fatalities have been reported between January 1, 1950, and December 31, 2020.

According to information obtained from the U.S. Dept. of Agriculture, Risk Management Agency (RMA), crop loss due to severe summer weather totals \$15,411,425.77 annually in Barnes County between January 1, 2001, and December 31, 2020.

Profile meeting participants and the Steering Committee indicated the probability of severe summer weather in Barnes County is highly likely, meaning that there is a 100 percent probability in the next year of an occurrence.

### **Extent/Magnitude**

The extent/magnitude of a hazard or threat is expressed in the amount and/or number of damages or losses either actualized in a community or estimated based on known assets and levels of risk. The extent/magnitude of the severe summer weather ranges from large tornados and hail causing massive property and crop damage, power outages, and loss of critical facilities and infrastructure to localized flooding and fallen tree branches. Figures 4.11.1 to 4.11.3 illustrate the history of significant hail, tornado, and wind speed occurrences recorded between 1950 and 2018 in Barnes County.

Profile meeting participants and the Steering Committee indicated the magnitude or impact of severe summer weather as catastrophic meaning as an estimated 50 percent or more of Barnes County could be affected.

#### 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)

- According to the 2018 N.D. Enhanced Mitigation MAOP, FEMA recognizes four wind zones in the United States. Winds speeds can reach up to 160 miles per hour in Zone II and 200 miles per hour in Zone III. No special wind regions are identified in North Dakota. Barnes County is split in half longitudinally between Zones II and III.

### National Climatic Data Center (NCDC)

The following significant severe summer weather events were obtained from the National Climatic Data Center (NCDC) and are shown to illustrate the intensity and/or severity of severe summer weather in Barnes County.

- **August 18, 1994.** A hailstorm impacting areas west of Valley City produced hail 2.75 inches in diameter.
- **June 24, 2003.** A Thunderstorm Wind event produced winds of 97 m.p.h. and impacted the city of Valley City resulting in \$1,400,000.00 in damages.
- **July 18, 2004.** An F4 Tornado impacted the Litchville area in southwest Barnes County resulting in \$1,700,000.00 in damages.
- **May 27, 2019.** An EF1 tornado impacted the city of Leal.

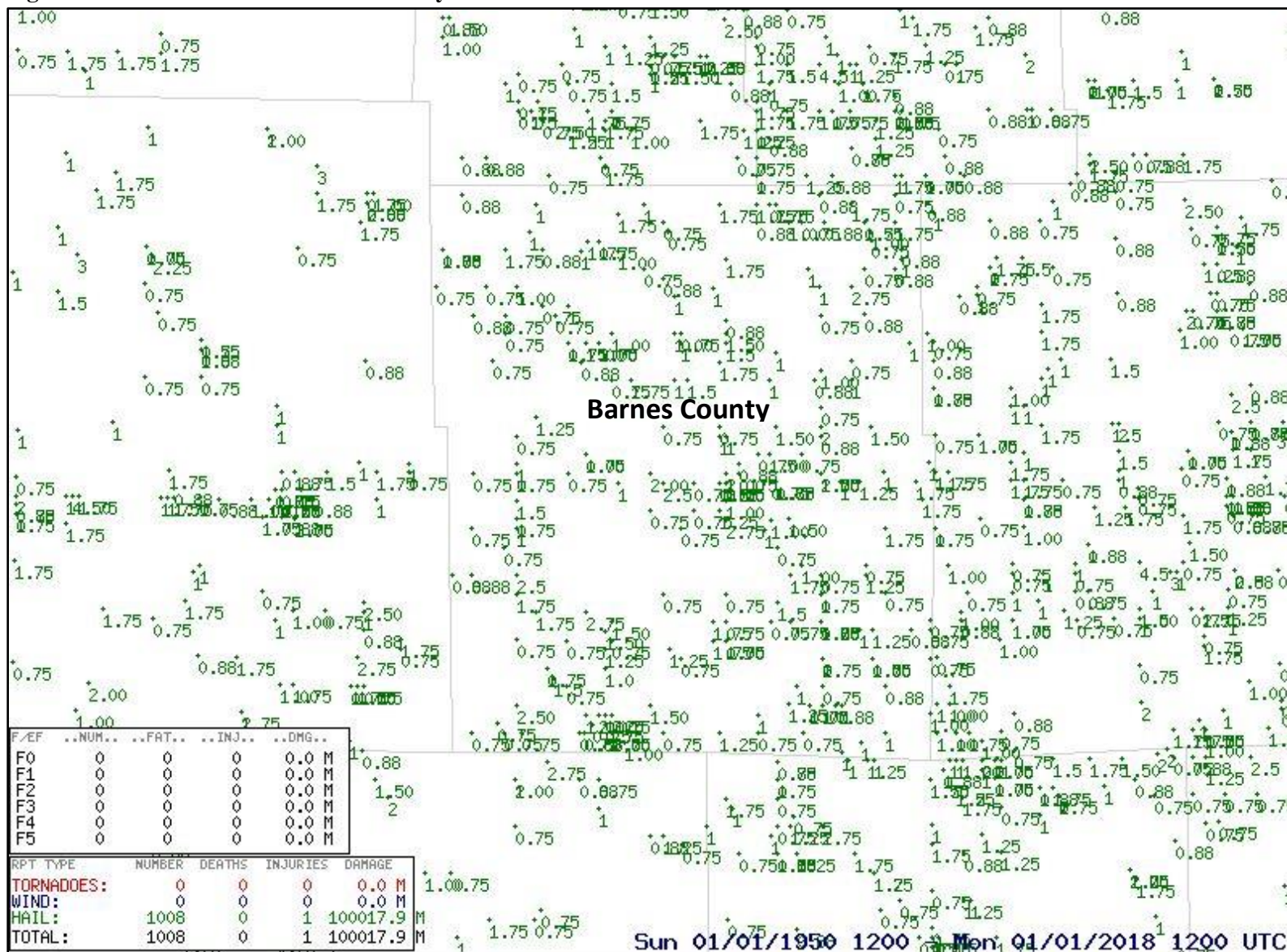
### Barnes County Emergency Management

The following significant severe summer weather events were obtained from Barnes County Emergency Management and are listed to illustrate the extent/magnitude of the severe summer weather in Barnes County.

- **July 1993** – research the severe storm that resulted in 10 inches of rain, water over bridges, floating propane tanks, etc. Research this at VCTR.
- **Another storm event in July 1975** – Kathryn area. Flooded Clausen Springs, etc.

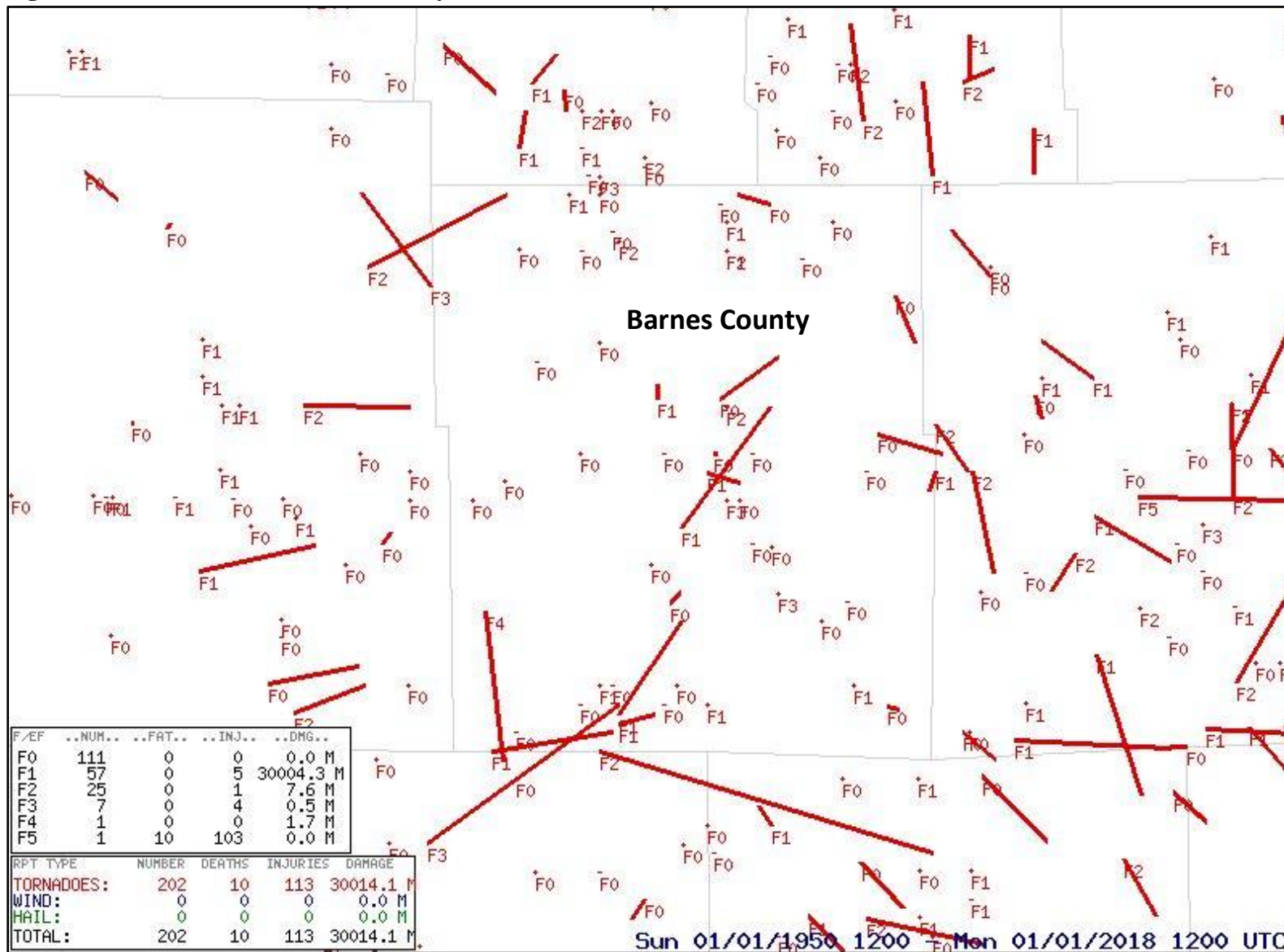


Figure 4.11.1 – 1950 to 2018 Barnes County Recorded Hail Occurrences



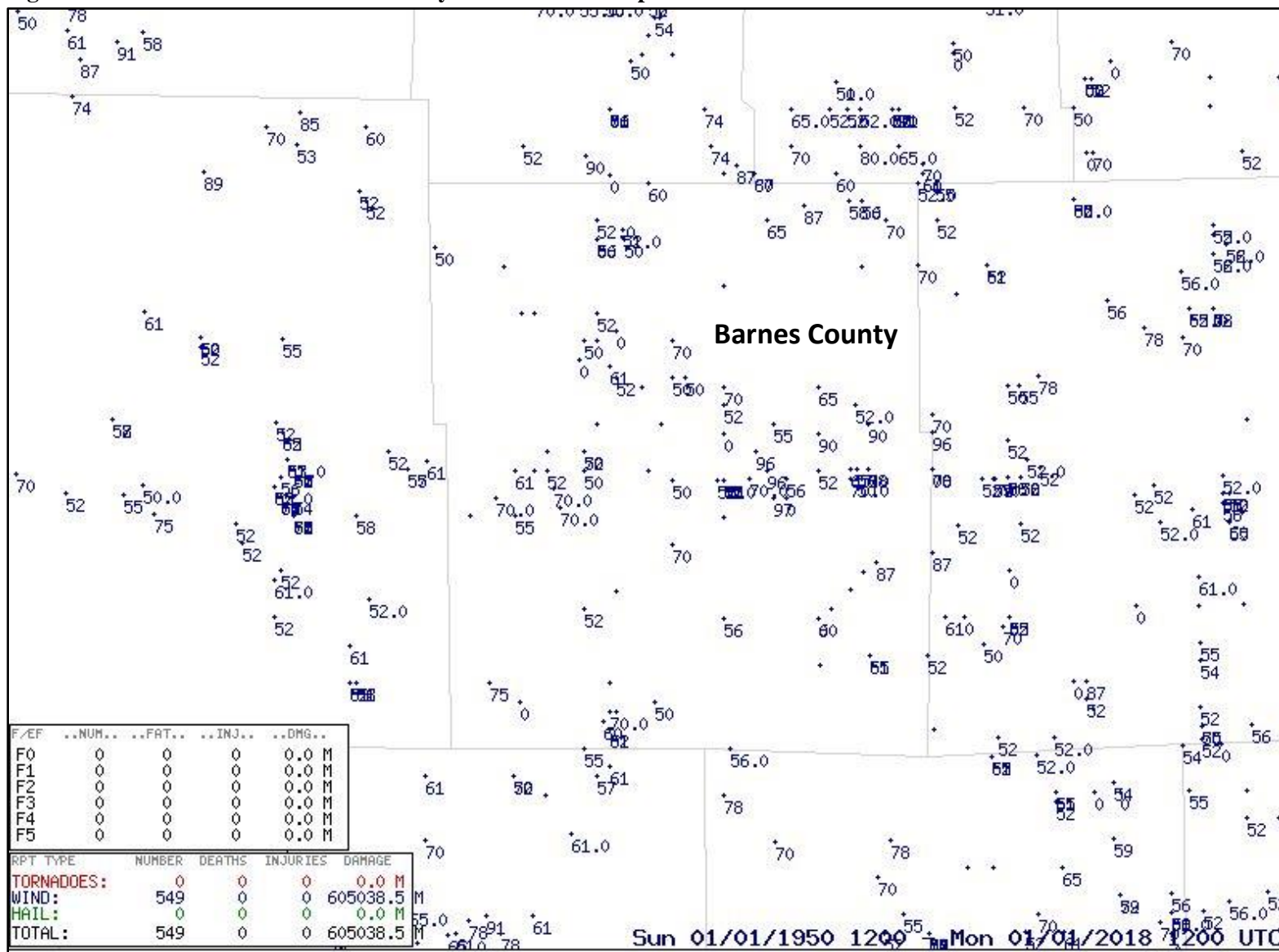
Source(s): National Oceanic and Atmospheric Administration (NOAA), Storm Prediction Center

Figure 4.11.2 – 1950 to 2018 Barnes County Recorded Tornado Occurrences



Source(s): National Oceanic and Atmospheric Administration (NOAA), Storm Prediction Center

Figure 4.11.3 – 1950 to 2018 Barnes County Recorded Wind Speed Occurrences



Source(s): National Oceanic and Atmospheric Administration (NOAA), Storm Prediction Center

**Risk Assessment**

Table 4.11.2 shows the risk assessment as determined by individual jurisdictions, the Steering Committee, and meeting participants at the profile meeting for severe summer weather. The risk assessment methodology can be found in the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA). The total in Table 4.11.2 represents the sum of each jurisdiction’s impact, frequency, likelihood, and vulnerability to a hazard/threat less the jurisdiction’s capabilities to respond to the hazard/threat.

**Table 4.11.2 – Barnes County Severe Summer Weather Risk Assessment Scored Chart Summary**

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	4	4	4	3	2	<b>13</b>
Dazey	3	2	3	3	2	<b>9</b>
Fingal	4	3	3	3	1	<b>12</b>
Kathryn	3	2	2	2	2	<b>7</b>
Leal	4	3	3	3	2	<b>11</b>
Litchville	3	3	4	3	1	<b>12</b>
Nome	4	3	3	4	1	<b>13</b>
Oriska	3	3	4	3	2	<b>11</b>
Pillsbury	2	4	3	2	1	<b>10</b>
Rogers	4	3	3	3	2	<b>11</b>
Sanborn	4	2	4	3	1	<b>12</b>
Sibley	4	2	3	4	1	<b>12</b>
Valley City	3	4	4	2	3	<b>10</b>
Wimbledon	3	3	3	3	2	<b>10</b>

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 4.11.3 provides information on the specific impact, frequency, likelihood, vulnerability, and capability of severe summer weather in Barnes County. A list of impacts identified as commonplace for natural hazards and man-made threats regardless of the jurisdiction is shown at the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA).

**Table 4.11.3 – Barnes County Severe Summer Weather Risk Assessment**

<p><b>Impact</b></p>	<ul style="list-style-type: none"> <li>• <b>Blocked Roads:</b> Barnes County Road 19, N.D. Highway 46 at Mile-marker/reference point 44 was overtopped by water and blocked west of Litchville summer 2021, Interstate 94 near Oriska (pipe added to improve drainage and is now mitigated)</li> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – heat exhaustion or from flying debris</li> <li>• Loss of Livestock</li> <li>• Loss of Crops</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Property/Vehicle Damage – repair of roofing, siding, and drainage systems for homes, windows and paint for cars</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> <li>• Strain to emergency services and responders if damage is widespread</li> <li>• Overland flooding in Valley City due to improper drainage in some areas</li> <li>• <b>Unpaved streets in small jurisdictions can become damaged from rainfall and moisture</b></li> <li>• <b>Direct hit from a tornado would be catastrophic</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Region-wide impact as Barnes County (and Valley City) serves as the economic center between Jamestown and Fargo</b></li> <li>• <b>\$9,308,250.00 in property damage and \$13,063,000.00 in crop damage between January 1, 1950, and December 31, 2020, according to NCDC.</b></li> <li>• <b>One injury reported between January 1, 1950, and December 31, 2020.</b></li> <li>• <b>Temporary economic boost due to rebuilding/repairs of homes, businesses and other structures.</b></li> <li>• <u>July 18, 2004.</u> An F4 Tornado impacted the Litchville area in southwest Barnes County resulting in \$1,700,000.00 in damages.</li> <li>• <u>June 24, 2003.</u> A Thunderstorm Wind event produced winds of 97 m.p.h. and impacted the city of Valley City resulting in \$1,400,000.00 in damages.</li> </ul>
<p><b>Frequency</b></p>	<ul style="list-style-type: none"> <li>• Annual occurrences of power loss from storms</li> <li>• Property damage from tornados/straight-line winds in summer 2017</li> <li>• Windstorms occurring annually</li> <li>• Two or three significant storms producing damage to trees and property annually</li> </ul>	<ul style="list-style-type: none"> <li>• <b>577 occurrences between January 1, 1950, and December 31, 2020, or eight severe summer weather events of significance annually</b></li> <li>• <b>Barnes County experiences approximately \$131,102.11 in property damage and \$183,985.22 in crop damage annually</b></li> </ul>
<p><b>Likelihood</b></p>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> </ul>	

**Table 4.11.3 – Barnes County Severe Summer Weather Risk Assessment - Continued**

<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Lack of permanent generators at critical facilities and infrastructure</li> <li>• Aging infrastructure (roads, water, electrical systems)</li> <li>• Small communities have experienced prolonged response from emergency services due to location and blocked roads occasionally</li> <li>• Lack of funding to improve previously low-traffic roads as traffic volumes increase due to economic activity</li> <li>• Increase in permanent and temporary populations, and economic activity, will increase amount of people and community assets exposed to severe summer weather events</li> <li>• <b>County campgrounds are expanding in capacity</b></li> <li>• Industrial development at Spiritwood in neighboring Stutsman County</li> <li>• Presence of pipelines, rail, and truck traffic carrying hazardous materials through the county</li> <li>• <b>Lack of 24-hour storm shelters in smaller communities and rural areas of the county</b></li> <li>• Structural integrity of temporary housing</li> <li>• Staff limitations during events of significance</li> <li>• Lack of ordinances regulating lighting of roadways and right-of-way encroachment in rural areas</li> <li>• Lack of storm water systems in small cities and rural areas</li> <li>• Lightning strikes causing fires and damage to structures</li> <li>• Removal of shelterbelts leaves little to no protection to structures from severe summer weather</li> <li>• Critical facilities: Barnes County Correctional Center, Barnes County Courthouse, Barnes County Law Enforcement Center, Barnes County Hwy Dept. Headquarters, Valley City City Hall, CHI-Mercy Hospital, all fire halls and ambulance buildings county-wide</li> <li>• Stormwater storage and drainage from rural to urban</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Building Codes</li> <li>• Advanced warning/notification such as internet and TV</li> <li>• Switching of overhead power lines to underground – change to fiber-optic lines</li> <li>• Instant communication capabilities through cell phones</li> <li>• Increase in technological capabilities of tractors and farm equipment to warn farmers of severe storms</li> <li>• Emergency sirens are in place throughout the county</li> <li>• Education in schools has increased</li> <li>• Better predictions from the National Weather Service</li> <li>• Switch to no-till farming reduces blowing of soil</li> <li>• <b>City of Valley City conducting river restoration project to reduce/eliminate erosion of riverbanks</b></li> <li>• <b>Increased awareness through Barnes County Everbridge</b></li> <li>• <b>Presence of social media alerting to the public</b></li> <li>• <b>Advancements in public works equipment to use for responding to significant events</b></li> </ul>
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**Table 4.11.3 – Barnes County Severe Summer Weather Risk Assessment - Continued**

<p><b>Vulnerability</b></p>	<ul style="list-style-type: none"> <li>• Undersized culverts for drainage</li> <li>• Older bridges are not large enough to allow for adequate drainage of runoff/do not meet current standards</li> </ul>				
<p><b>Capability</b></p>	<table border="0"> <tr> <td> <p><u>Administrative and Technical</u></p> <ul style="list-style-type: none"> <li>• Active county commission</li> <li>• Contract for engineering, planning, and grant writing</li> <li>• GIS services provided by the state and county</li> <li>• Full-time emergency manager</li> <li>• Relies on county, state and other agencies for emergency assistance</li> <li>• Sheriff’s Office regulates weight and size of trucks traversing county roads</li> <li>• County has county-wide mutual aid agreement for emergency services</li> <li>• Full-time county highway superintendent and department staff</li> <li>• Full-time public works department in Valley City</li> <li>• Barnes County Sheriff’s Office</li> <li>• Valley City Police Department</li> <li>• All county fire departments and ambulance services</li> <li>• City of Valley City has a full-time building code inspector</li> <li>• County zoning administrator providing building inspection services to smaller jurisdictions</li> <li>• <b>Barnes County Everbridge</b></li> <li>• <b>NDDOT office in Barnes County (Valley City)</b></li> <li>• <b>N.D. 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### **Vulnerabilities to Publicly-Owned Buildings and Property**

Publicly-owned buildings and property are susceptible to severe summer weather in many forms. Buildings are often constructed to withstand impacts from severe summer weather, but may not sustain high wind speeds, tornadoes, or large hail. Large hail can damage building roofs, break windows, injure people and/or result in fatalities. Depending on the size of the building and the role it plays in day-to-day operations, the vulnerability to severe summer weather can vary from nominal for larger structures such as the Barnes County Courthouse and Barnes County Law Enforcement Center to severe for county shops in smaller cities, which are considerably less sturdy. The lack of stormwater management in smaller incorporated jurisdictions contributes to the vulnerability of publicly-owned buildings and property from flash flooding due to severe summer weather.

A summary of publicly-owned buildings is provided in Chapter 3, Profile and Inventory.

### **Vulnerabilities of Critical Facilities and Infrastructure**

Critical facilities such as Barnes County Courthouse, Barnes County Law Enforcement Center, CHI-Mercy Hospital, schools, water towers, roadways, publicly-owned buildings and other specialty facilities such as nursing homes and assisted living facilities are vulnerable to severe summer weather in a similar fashion to publicly-owned buildings and property. In terms of infrastructure, overhead power lines are susceptible to wind and debris, which can disrupt electricity and cause power outages. Disruptions in water service can be caused by physical damage to water towers or lift stations, or a loss of power. Roadways can become blocked due flash flooding and overland flooding or from windblown debris, which limits access for emergency services and disrupts economic activity. The lack of stormwater management in smaller incorporated jurisdictions contributes to the vulnerability of critical facilities and infrastructure to severe summer weather.

### **Vulnerabilities to New and Future Development**

Building codes ensure buildings and structures are built adequately to better withstand severe summer weather. Barnes County and the cities of Fingal, Kathryn, Leal, Nome, Oriska, Sanborn, and Valley City have adopted buildings codes, while the cities of Dazey, Litchville, Pillsbury, Rogers, Sibley, and Wimbledon have not. The lack of building codes puts these cities more at risk to damage and impacts from severe summer weather as a result. However, the zoning administrator for Barnes County will begin offering building inspection services to smaller jurisdictions in the county outside Valley City starting in 2021/2022. Similarly, incorporated jurisdictions with a high number of trailer and mobile homes, which are more susceptible to severe weather, may experience more impacts from the hazard. An inventory of the household units by type in jurisdictions in Barnes County is shown in Chapter 3, Profile and Inventory. As populations grow, more people are at risk of injury and potential death from tornadoes, large hail, and windblown debris such as tree branches. Strengthening and enforcement of buildings codes would mitigate impacts from the hazard. This mitigation project for the county can be found in Chapter 6, Mitigation Strategy.

### **Data Limitations**

Residents often experience impacts from severe summer weather, such as broken windows on homes or damage to vehicles, they do not report. Weather data provided by NCDC, NOAA, and other agencies can



be incomplete and reported damages can vary significantly from local sources. Fewer active storm spotters reduce the amount of reported weather information available to county emergency management.

### National Climatic Data Center/National Oceanic and Atmospheric Administration

The hazard history provided through the National Climatic Data Center/National Oceanic Atmospheric Administration's Storm Events Database contains data as entered by NOAA's National Weather Service (NWS). Due to changes in the data collection and processing procedures over time, there are unique periods of record available depending on the event type. The following timelines show the different time spans for each period of unique data collection and processing procedures. **All types of severe summer weather were not recorded cohesively until 1996.**

- 1. Tornado:** From 1950 through 1954, only tornado events were recorded.
- 2. Tornado, Thunderstorm Wind and Hail:** From 1955 through 1992, only tornado, thunderstorm wind and hail events were keyed from the paper publications into digital data. From 1993 to 1995, only tornado, thunderstorm wind and hail events have been extracted from the Unformatted Text Files.
- 3. All Event Types (48 from Directive 10-1605):** From 1996 to present, 48 event types are recorded as defined in NWS Directive 10-1605.

### U.S. Dept. of Agriculture, Farm Services Agency

The Livestock Indemnity Program (LIP) provides financial assistance to local producers that experience livestock losses. The program does not provide the cause of loss and, therefore, an accurate description of livestock loss from severe summer weather cannot be identified.

### U.S. Dept. of Agriculture, Risk Management Agency

One of the Cause of Loss categories for crop loss data from the U.S.D.A.-RMA is titled Other (snow, lightning, etc.) combines elements of severe summer weather and severe winter weather. Therefore, crop loss data for any given jurisdiction is incomplete.

### **Other Key Documents**

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following documents.

- 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)
- Barnes County Local Emergency Operations Plan
- Barnes County Threat and Hazard Identification and Risk Assessment (THIRA)
- Building Codes
- North Dakota Continuity of Operations Plan
- North Dakota Dept. of Transportation Design Manual
- North Dakota Drought Mitigation Plan
- North Dakota Emergency Operations Plan, Severe Summer Weather Annex

- North Dakota League of Cities: Planning and Zoning Handbook
- North Dakota State Building Code
- North Dakota State Disaster Recovery Plan
- North Dakota State Preparedness Report (SPR)
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

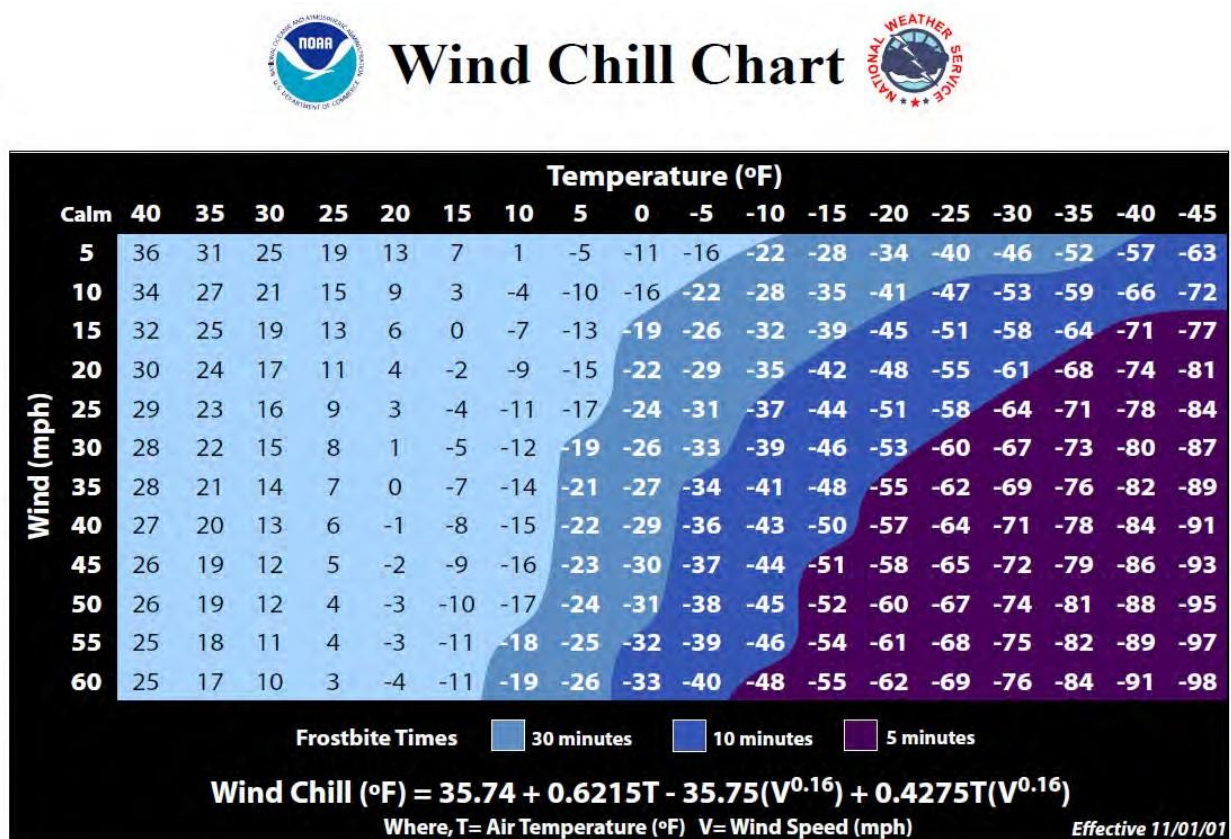
## 4.12 Severe Winter Weather

Including blizzards, extreme cold, heavy snow, ice storms, recycled snow, structure collapse, and secondary hazards.

### Characteristics

Winter storms have the capability to completely immobilize large areas of a state or several states simultaneously. Winter storms occur in several forms, such as heavy snowstorms, blizzards, and ice storms. Each in its own way is a potential killer of hundreds of people, livestock and wildlife, whenever the storm strikes. A brief explanation of each follows Figure 4.12.1.

Figure 4.12.1 – Wind Chill Chart



Source: National Weather Service

**Blizzards** are the most dramatic and dangerous winter storms. A blizzard has winds of 35 mph or more with snow and blowing snow reducing visibility to less than ¼ mile for at least 3 hours. Blizzards are usually characterized by low temperatures and by strong winds bearing substantial amounts of snow. Snowfall is usually present during the preliminary stages of the blizzard. However, most of the snow in a blizzard is in the form of fine, powdery particles of snow which are whipped up from the surface in such great density that at times the visibility is only a few yards, creating a blinding condition.

**Extreme Cold** includes prolonged periods of cold temperatures throughout the winter months. People are forced to limit time spent outdoors in extreme frigid conditions. When cold temperatures combine

with wind, dangerous wind chill occurs. Wind chill describes how cold it feels and is based on heat loss on exposed skin from wind and cold. The wind chill makes it feel much colder than the actual temperature.

**Heavy Snow** is probably the most significant winter weather phenomenon. Snow can be continuous, intermittent, flurries or if showery in nature, snow squalls. Snow squalls are brief and intense for short durations and are comparable to summer rain showers. Blowing and drifting snow often occur together, due to strong-winds and falling or loose snow on the ground.

**Ice Storms** are freezing rain or drizzle occurs when surface temperatures are below freezing. The moisture falls in liquid form freezing upon impact, resulting in ice or glaze on exposed surfaces and is called an ice storm. Sleet sometimes incorrectly referred to as an ice storm; is frozen rain drops and ice pellets, which bounce when hitting the ground. Sleet does not stick to trees but enough can cause hazardous driving conditions. Heavy accumulations of ice can bring down trees, topple utility poles/power lines and communication towers; and can disrupt communications and power for days while utility companies repair extensive damage. Small accumulations of ice can be extremely dangerous to motorists and pedestrians because bridges and overpasses freeze before other surfaces.

**Recycled Snow** is the ongoing blowing and drifting of already accumulated snow from one or more snow events that continues to blow and drift for days and weeks. The blowing snow is raised above the surface and blows in quantities that reduce visibility, continuously form new drifts, and fills in plowed roads up to three or four times per day. It is the most significant winter weather phenomenon in the county.

**Structure collapse** occurs when the forces of gravity or other external forces overcome the structural integrity of a building. A severe winter weather event, accompanied by ice and heavy snow, can lead to structure failure due to overwhelming ice and snow loads. Power lines and communications towers also topple during winter storms, disrupting supplies to residents, businesses, and agricultural producers.

**Secondary hazards** are often associated with severe winter weather. The most common hazards during winter weather events are transportation incidents. Roadways become hazardous quickly during snow, blowing snow, and ice events. Most incidents involve passenger vehicles; however, an incident involving a commercial vehicle transporting hazardous chemicals is always possible.

<b>Seasonal Pattern</b>	October to April – will occur in May in rare instances
<b>Duration</b>	Hours/days/up to a week in severe cases
<b>Speed of Onset</b>	12 to 24 hours warning
<b>Location</b>	Total geographic extent of Barnes County

For more information regarding severe winter weather please reference the **2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)**. The state plan can be accessed by following the electronic hyperlink or link to the N.D. Dept. of Emergency Services website:

[2018 North Dakota Enhanced Mitigation Mission Area Operations Plan](#)

<https://www.des.nd.gov/planning>

**History**

Information on the history of severe winter weather in Barnes County was obtained from the National Climatic Data Center (NCDC); the National Oceanic and Atmospheric Administration (NOAA); the USDA, Risk Management Agency; and Barnes County Emergency Management. History included in the 2015 plan was also copied over and included in this update. A detailed hazard history for Barnes County can be found on a disc located at the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment.

National Climatic Data Center/National Oceanic and Atmospheric Administration

Table 4.12.1 summarizes the history of severe winter weather in Barnes County between January 1, 1996, and December 31, 2020. Data was not available between January 1, 1950, to December 31, 1995, as only occurrences of tornado, thunderstorm wind and hail were recorded. Starting January 1, 1996, all event types (48) are recorded. The following are key points.

- Barnes County experienced 179 occurrences of severe winter weather resulting in approximately seven storms of significance annually.
- Approximately \$12,302,000.00 in property damage was reported.
- No injuries or fatalities were reported.

**Table 4.12.1 – 1996 to 2020 Barnes County Severe Winter Weather Hazard History Summary**

Severe Winter Weather				
Occurrences	Injuries	Fatalities	Property Damage	Crop Damage
179	0	0	\$12,302,000.00	\$0.00

Source(s): National Climatic Data Center (NCDC), National Oceanic and Atmospheric Administration (NOAA)

U.S. Dept. of Agriculture, Risk Management Agency

Crop loss from severe winter weather is tracked by the U.S. Dept. of Agriculture, Risk Management Agency (RMA). The RMA provides data on the crop type affected, damage cause description, determined acres and indemnity amount. The damage cause description identifies the cause of damage, determines acres identifies the number of acres lost due to damage, and the indemnity amount identifies the total amount of the loss for the designated peril. **Between January 1, 2001, and December 31, 2020, Barnes County experienced 92 incidents of crop loss due to severe winter weather impacting approximately 153,547.64 acres of crops totaling \$11,098,330.48.**

2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)

- Barnes County experienced \$272,000 in property damage from 120 severe winter weather events between 2000 and 2018.
- Claims paid for collapse on state facilities and other critical facilities insured by the North Dakota Tornado and Fire Fund, 2013, between 1989 and 2013 includes \$2,846,226 to state agencies, \$1,150 to local governments, and \$50,804.57 to school districts in Barnes County. No claims were paid to adjutant general or state universities.

- **January 1997.** A portion of the roof of the Winter Show Building in Valley City collapsed due to heavy snow loads postponing events.

### Barnes County Emergency Management

- Information on the 1997 ice storm is forthcoming
- 2016 blizzard

### 2015 Barnes County Multi-Hazard Mitigation Plan

**Winter 1935-1936.** Temperature extremes and severe blizzards paralyzed Barnes County. Cold was so severe horses' noses bled pulling sleighs.

**Winter 1968-1969.** Heavy snows caused flooding and ice jams in the spring.

**Winter 1978-1979.** Several inches of slush hit North Dakota in October, froze on the roads, and did not melt off until spring. Heavy snow and snow mixed with field dirt on the roadways throughout the winter.

**November 22, 1993.** Heavy snow affected a large part of North Dakota. A slow moving and enormous storm over North America brought record single-storm snowfall to much of North Dakota. Over two feet of snow fell over a large part of central and southeast North Dakota, and most of North Dakota had over a foot of snow from this storm. The greatest snowfall amount was reported at Oakes, in Dickey County in southeast North Dakota of 31 inches. At the National Weather Service office in Bismarck, 28.3 inches of snow was measured during the 108 hour snow event. This amount set a new single-storm record for snow in Bismarck. The snow began the evening of the 22<sup>nd</sup> and did not end until the morning of the 27<sup>th</sup>. Except for about six hours during the day on the 26<sup>th</sup>, the snow was continuous through this period. The snowfall was intermittent over most of North Dakota during this lengthy event. Fortunately, the wind was only 10 to 25 mph during this storm, so it was well below blizzard conditions and blowing and drifting of snow was not a problem. The storm occurred during the week of Thanksgiving, so many travelers were stranded. The prolonged snowfall kept snow removal crews working around the clock, and a few motorists crashed into the snowplows. Out in the rural areas, some farm buildings collapsed in the heavy snow. Property damage from this storm was estimated at \$500,000.

**April 25, 1994.** A late season winter storm came a few days after temperatures of 80 degrees. Parts of southern North Dakota received almost a foot of heavy wet snow. Some thunder occurred with the snowfall. Winds of 25 to 45 mph caused blizzard conditions at times, and snow drifts three feet high. This late storm brought record seasonal snowfall to many parts of the state. Snowfall for the winter season topped 100 inches in some places. The storm closed schools and businesses and shut down travel. Property damage from this storm was estimated at \$50,000.

**January 16, 1995.** A low pressure system moved northeast out of the central Rockies and through northern Minnesota. The low was responsible for areas of freezing rain and drizzle, heavy snow and gusty winds. Freezing drizzle and rain preceded the heavy snow and coated the roads and power lines with ice. Logan and LaMoure Counties have power outages due to the ice. Six to

twelve of snow fell over the area with a maximum of fourteen inches in Underwood in McLean County. The freezing drizzle and rain, heavy snow, and winds gusting to 35 mph made travel hazardous. Several schools were closed and no travel was advised in McHenry, Griggs, Stutsman, Ward, and Dickey Counties.

**March 26, 1995.** Several hours of light rain and drizzle preceded the snow. Six to eight inches of wet snow was common with Edgeley receiving a total of fourteen inches. Grand Forks and Steele Counties advised to travel.

**February 22, 1996.** Freezing rain made travel and walking dangerous. No travel was advised and US Highway 2 was closed from Devils Lake to Grand Forks. Minor car accidents and vehicles in the ditch were common. One hospital in Fargo reported setting about a dozen fractured bones on Thursday night.

**November 20, 1996.** Very little wind accompanied this winter storm. Seven inches of snow fell in Grand Forks and 6.1 inches of snow fell in Fargo.

**January 1997.** Blizzards racked the area, closing either north-south, or east-west bound roads almost every day. Some days, all roads were closed, including Interstate 94. National Guard was called in with bulldozers to push back drifts, especially on Old #10 where drifts were 15 feet tall and extended across the road between Sanborn and Valley City. Three rotary plows were obtained through North Dakota State Emergency Management to shoot snow away from the ditches to slow down blocking of roads in the next wind. Interstate 94 was closed about 20 days that winter.

**January 30, 1997.** 0.05 inches of freezing rain fell across eastern North Dakota, causing numerous vehicle accidents. Many vehicles slid off roads, while others could not travel up slopes. Emergency officials could not reach accident scenes or help stranded motorists.

**March 13, 1997.** A band of heavy snow fell across southeast North Dakota, where Lisbon reported 12 inches of new snow. Litchville and Cayuga both reported 10 inches of new snow, Havanna reported 9 inches, and Lidgerwood reported 8 inches. A north to northeast wind gusted up to 35 mph, which resulted in the closure of Interstate 94 from Bismarck to Fargo.

**April 4, 1997.** An intense low pressure system, with center pressures around 28.8 inches, tracked from Fergus Falls to International Falls, Minnesota. The initial rain was accompanied by lightning and thunder in southern Grand Forks County, and then changed to freezing rain as the temperatures dropped. On-half to two inches of ice built up on exposed surfaces. Hundreds of power poles and lines snapped due to the weight of the ice, cutting power to many homes and businesses, many of which were beginning to fight the spring flood. The wind reporting systems on the AWOS and ASOS sites across eastern North Dakota froze in place, remaining out for seven days. The three inches of liquid equivalent from the storm fell on top of a record snow pack. Property damage as a result of this storm was estimated as \$96,000,000.

**April, 1997.** People were sandbagging for a flood when freezing rain fell and caused power lines to break. This was followed by many inches of grapple, and finally a blizzard and subzero temperatures. As power was cut off, basements in multiple areas began to flood.

**November 13, 1997.** Four to seven inches of snow fell across southeast North Dakota along with 30 mph wind speeds. Visibilities were low and travel was dangerous. Schools in Valley City were closed for the day.

**February 27, 1998.** A very strong low pressure system traveled across Minnesota, bringing rain and snow to eastern North Dakota. Temperatures started out in the 30's, much above average for February, with dew points in the 20's. As the low tracked across Minnesota, the storm began with thunder and lightning. Echoes on radar almost seemed more like those seen in the summer months. As the cold air dropped south from Canada into northeast North Dakota, the rain changed to snow. Five inches fell across most of northeast North Dakota. Strong winds picked up across the Devils Lake area, prompting law enforcement to close US Highway 2 west of Devils Lake.

**November 18, 1998.** The first significant snow event of the winter started out with lightning and thunder. Thunder was reported in Valley City and Fargo. Although visibilities were quite poor due to the heavy snow, very strong winds never materialized. Thirteen inches of snow was measured at the Grand Forks Air Force Base and 12.9 at the NWS in Grand Forks. Slightly lesser amounts were reported south of Grand Forks. Interstate 29 was closed from Fargo to the Canadian Border and US Highway 2 was closed from Devils Lake to Grand Forks.

**January 1, 1999.** A band of heavy snow fell from the Valley City area southward to Forman, North Dakota. Valley City reported 8 inches of snow, Litchville reported 7.5 inches, and Forman reported 9 inches. Snow totals tapered off rapidly to the east of this area.

**April 1, 1999.** A strong low pressure system moved out of the central plains into Ontario, bringing moisture and strong winds to portions of eastern North Dakota. With the temperature hovering around the freezing point, much of the rain froze when it make contact with the surface.

With ice built up on trees, many branches broke, resulting in power outages. Most power companies were able to restore power within several hours. A 10 mile section of H-shaped aluminum power poles were snapped by the weight of the ice on the power lines 5 miles north of Valley City. The cost to replace the poles was estimated at \$2.5 to 4 million.

**April 3, 1999.** A strong low pressure area in Minnesota brought another round of winter weather to eastern North Dakota on the heels of the April Fools Day storm. Significant accumulations of ice built up on all surfaces due to a long period of freezing rain. Thousands of power customers lost power, as power lines snapped due to the weight of the ice. Icicles up to two to four inches long were common on power lines and trees. City foresters were kept busy for weeks trying to haul away branches and fallen trees. This ice storm brought back memories of the ice storm of early April 1997.

**March 8, 2000.** A narrow band of freezing precipitation fell across southeast North Dakota and northwest Minnesota. Gusty north winds also combined with the ice to make travel difficult.

Potential damage from winter storms was estimated at \$10,000,000 to building collapse and animal losses. The Winter Show building collapse in 1997 was about \$4,000,000.



### **February 23, 2001, 6:00 PM CST – February 24, 2001, 11:07 PM CST**

A Colorado Low moved from eastern Nebraska into southeast Minnesota, bringing two periods of snow to eastern North Dakota. The first snow moved across the area on the 23rd, started out as freezing drizzle in southeast North Dakota. Snow was widespread of 1 to 3 inches. More snow fell on the 24th, and wind speeds also increased. Five to nine inches of snow was common across this area.

### **February 24, 2001, 11:08 PM CST – February 25, 2001, 11:47 AM CST**

As the low pressure system moved east, strong north winds funneled down the Red River Valley. Whiteout conditions developed, especially along and south of Interstate 94. As a result, Interstate 29 was closed from the South Dakota border to Grandin and Interstate 94 was closed from Buffalo to the Minnesota border. Wind speed gusts ranged from 38 to 44 mph.

### **April 22, 2001, 3:30 PM CST – April 23, 2001, 3:19 AM CST**

A strong low pressure system tracked from Colorado into Wisconsin, and set up an inverted trough over the southern Red River Valley. A mix of rain, freezing rain, and snow fell across southeast North Dakota and west central Minnesota. Snowfall amounts ranged from 7 to 12 inches, with liquid water equivalents from 1 to 2 inches. This snow fell during the spring flood along the Red River, keeping river levels high through the end of the month. Due to the slushy nature of the snow, secondary roads became impassable. Many cars slid off roads and several schools cancelled classes on Monday the 23rd.

### **December 22, 2001, 12:29 PM CST – December 23, 4:00 AM CST**

30 to 35 mph winds, gusting up to 45 mph, along with light snow, brought the visibility down below a quarter mile across the area. Many people were in Grand Forks to watch a basketball game at UND. With no travel recommended, motels quickly filled up and the Alerus Center had to be opened to accommodate people overnight. Numerous cars ended up in ditches, especially along Interstate 94.

### **March 8, 2002, 3:35 PM CST – March 9, 2002, 11:16 AM CST**

Strong winds and snow combined produced visibility between a quarter mile and a half mile across the area. Snow accumulations were from 3 to 5 inches and wind gusts of 46 mph.

### **December 18, 2002, 10:24 AM CST – December 19, 3:49 AM CST**

6 to 8 inches of snow fell across the area. Light freezing rain or sleet fell early on the 18th, with winds around 25 mph.

### **February 11, 2003, 9:55 AM CST – February 11, 2003, 6:00 PM CST**

A strong arctic front moved through the northern plains, and produced strong northwest winds. Strong winds occurred across the area with gusts of 56 mph. Little snow was associated with the frontal passage, but there was about an inch of fluffy snow on the ground at the time. The worst

visibilities were found in open areas. With little falling snow and mostly sunny conditions above the blowing snow layer, it was considered a ground blizzard. Dirt mixed in with the snow, creating dirt/blowing snow mix.

### **March 8, 2003, 2:54 PM CST – March 9, 2003, 12:00 PM CST**

A fairly compact ridge of high pressure brought clear skies and brisk west/northwest winds to eastern North Dakota. High temperatures were only in the single digits above and below zero. The west/northwest winds of 15 to 25 mph with a few gusts to 35 mph with overnight temperatures 10 below to 20 below zero (about 30 degrees below normal). This dropped wind chill temperatures to 40 below to 50 below zero. These extreme wind chill temperatures disrupted public events and services. Some schools cancelled or postponed activities and numerous water main breaks were also reported.

### **January 24, 2004, 3:25 PM CST – January 26, 2004, 3:15 PM CST**

An inverted trough extended into the northern plains from an area of surface low pressure over the central plains. Much of the area received over 6 inches of snow. Wind chills were from 20 to 30 below zero. Many Sunday church services and other activities were cancelled. Most schools closed on Monday, while others started late.

### **January 26, 2004, 3:30 AM CST – January 31, 2004, 11:59 PM CST**

Arctic high pressure built into the northern plains in the wake of the January 24<sup>th</sup>-26<sup>th</sup> snowstorm, which dropped heavy snow over all the eastern North Dakota. With subzero temperatures and wind speeds of 10 to 20 mph, wind chills dropped to 40 to 65 below zero on the afternoon of the 27<sup>th</sup>.

### **February 10, 2004, 3:24 PM CST – February 11, 2004, 3:50 PM CST**

An Alberta Clipper system from Minot, ND and a surface high also built into eastern Montana, aligning a strong surface pressure gradient over central North Dakota. Winds gusted around 35 mph along with 1 to 3 inches of new snow. Along with the snow already on the ground, this made for ground blizzard conditions. Schools were closed on Wednesday in Barnes and Ransom Counties.

### **March 1, 2004, 10:04 AM CST – March 1, 2004, 9:40 PM CST**

An area of surface low pressure tracked near Omaha, NE, with an inverted trough extending northward into the Red River Valley. Temperatures hovered around and above freezing. Areas received roughly 2 to 5 inches of snow along with about ½ inch of sleet or ice. As the system departed the area, north winds increased to 20 to 35 mph, producing near zero visibilities in open country.

### **June 23, 2004, 12:00 AM CST – June 24, 2004, 11:59 PM CST**

An upper level low pressure system parked near Hudson Bay helped produce unusually cold weather for mid-June. Temperature reported ranged from 32 to 37 degrees which produced

patchy frost for the mid June growing season. Some sensitive crops, especially over northeast North Dakota, were unable to recover.

### **August 19, 2004, 12:00 AM CST – August 21, 2004, 11:59 PM CST**

Patchy frost occurred over portions of the area throughout these 3 mornings, which was not normal for August. As patchy frost also occurred on June 23rd and 24th, the only summer month that didn't have frost was July. The usual date for a first frost is not until mid to late September. Daily, monthly, and seasonal temperature records were all set. Low temperature ranged from 30 to 38 degrees. Damage to crops was widespread and yet spotty. Crops in lower lying areas were more susceptible to frost than those slightly higher. Some crops, like soybeans, edible beans, and corn, were also more susceptible to frost than root crops such as sugar beets and potatoes. Some crop varieties were also more frost resistant than others. The cool summer and prior frosts put many crops about 2 to 4 weeks behind schedule. The majority of crops that needed warm nights to mature (such as corn or tomatoes) were not expected to make it. North Dakota crop losses were estimated at \$530 million, but crop insurance was expected to offset about \$201 million of this amount, leaving a net loss of about \$329 million. However, this estimate covered summer flooding, drought, and the cool weather. The tourism/resort industry also reported decreased summer revenue. Garden and vegetable farmers were hit hard, with some vegetables not ripening. Leaves on trees turned color early and started falling from trees. The bee industry was also hurt by the cold. ND was the nation's top honey producer in 2002 and was second in 2003. The cold weather meant fewer blossoms and less active bees. In 2003, North Dakota produced 29.6 million pounds of honey worth over \$40 million.

### **December 11, 2004, 9:20 PM CST – December 12, 2004, 3:33 PM CST**

A surface low pressure system tracked from north of Winnipeg (Canada) to the Minnesota arrowhead, bringing the first winter storm of the season. Several light snow events in the days prior to this event had left some snow cover over most of eastern North Dakota and the northwest quarter of Minnesota. 4 to 6 inches of snow depth was reported along a Langdon to Devils Lake to Finley (all ND) to Ada (MN) line. However, the first part of December also brought near-record warmth. Temperatures on Saturday the 11th climbed into the upper 30s to middle 40s, putting a good crust on the snowpack. The above-freezing temperatures held into the early part of Sunday (12th), so the precipitation began as a rain/freezing rain mix. The rain also helped melt some of the snowpack and keep it crusted. As temperatures fell Sunday, any slushy or wet spots turned to ice. Wind speeds also increased as the low pressure system passed through, with many locations reporting gusts over 50 mph. Wind sensors at Hallock, Fisher, St. Vincent, and 8 miles west of Donaldson (all in extreme northwest MN) reported gusts over 58 mph. These strong winds, in addition to some light snow showers, produced whiteout conditions at times. The worst visibilities occurred in the northern red river valley, where trucks were routed off Interstate 29 for a time. Highway departments in other areas urged people to use extreme caution if they had to venture out.

### **December 30, 2004, 7:39 AM CST – December 30, 2004, 3:00 PM CST**

A "hybrid" surface low pressure system moved nearly straight east across the northern plains. It tracked across northern South Dakota to Aberdeen, then toward Bemidji (MN) and Duluth. A strong thermal gradient developed during the day on Thursday (30th), with highs from around 20

near Cando, ND, to around 40 from Forman, ND, to Parkers Prairie, MN. An area of rain over eastern South Dakota moved into southeast North Dakota and west central Minnesota and fell as freezing rain. A good quarter to half inch of ice accumulated across the area. As temperatures rose to the melting point or above by Thursday afternoon, some of the ice melted. This prevented widespread power outages and major travel problems. Even so, quite a few accidents were reported. As the low pressure system moved east, temperatures fell Thursday night. Any slush or wet spots quickly froze, making travel hazardous once again.

### **December 31, 2004, 3:35 PM CST – January 2, 2005, 12:50 AM CST**

This event began on the afternoon of December 31, 2004. This was a more typical "Colorado Low," and it brought some freezing drizzle and snow to portions of eastern North Dakota and the northwest quarter of Minnesota. The surface low tracked from the Kansas area toward western Wisconsin. The way this system set up, an impressive supply of gulf moisture was carried northward, moisture amounts well above normal for the time of year. Temperatures on Saturday (January 1, 2005) showed a strong northwest to southeast gradient, with the Cando (ND) area having a high of zero and the Park Rapids (MN) area around 20F. The freezing precipitation mostly affected the U.S. Highway 10 corridor. Snowfall amounts ranged from 5 to 8 inches along the Canadian border to around 4 inches along U.S. Highway 2. Wind speeds and blowing snow were not a factor in this system. Many county highway departments advised no travel.

### **January 12, 2005, 10:17 AM CST – January 13, 2005, 5:00 AM CST**

The northern plains were split between two areas of surface low pressure, one over the central plains and the other over southern Canada. The new snow was very powdery; therefore it was very susceptible to the wind (and blowing). As the wind did increase, it produced whiteout conditions just west of the Red River Valley. Arctic air also came down behind this system, as temperatures fell to -5F to -10F by midnight on the 12th (temperatures continued to fall into the 13th). With wind speeds gusting up to 45 mph, wind chill temperatures plunged to -40F to -50F. The combination of these factors caused many schools to close for the day on the 13th, especially in the Devils Lake region.

### **January 13, 2005, 5:35 AM CST – January 15, 2005, 3:03 PM CST**

Eastern North Dakota and portions of the northwest quarter of Minnesota ended up in a steady surface pressure gradient between high pressure just to the south and low pressure to the northeast. This produced wind speeds from 10 to 20 mph in combination with very cold temperatures. Daytime highs generally stayed from -5F to -15F while lows ranged from -20F to -35F. Wind chill temperatures ranged from -40F to -60F, which are wind chills in warning criteria.

### **January 21, 2005, 4:20 AM CST – January 22, 2005 6:53 AM CST**

Surface low pressure tracked from southern Alberta, to western North Dakota, into northeast South Dakota, and then into southern Minnesota. A little freezing rain fell south of a Valley City (ND) to Elbow Lake (MN) line. Meanwhile, 4 to 6 inches of snow fell along the Devils Lake (ND) to Fargo (ND) to Wadena (MN) corridor. After the surface low passed through, the wind speeds rapidly increased to gusts up to 50 mph. Whiteout conditions developed Friday afternoon

(the 21st) and continued into early Saturday. Initially a winter storm warning was issued for this event, but as it became clear that whiteout conditions would develop, it was upgraded to a blizzard warning. Many schools cancelled early on Friday afternoon, and many evening events were also rescheduled. Hundreds of vehicles were reported in the ditch. Several flights into Hector International Airport (in Fargo, ND) were cancelled. Numerous roads were closed.

### **November 27, 2005, 12:29:00 PM CST – November 29, 2005, 05:59:00 AM CST**

An inverted trough stretched into the Red River Valley, from a low pressure system passing through the central plains. The precipitation began as a mixture of rain and freezing rain, falling quite heavily at times. The most freezing rain fell across southeast North Dakota and portions of west central Minnesota, although lighter amounts did fall further north. Trees and power lines became weighted down with up to an inch of ice in places. As temperatures cooled and wind speeds increased, power lines started to gallop and break in great numbers. The wind speeds increased around the noon hour on 11-28-05 causing blizzard conditions across southeast North Dakota and west central Minnesota. Whiteout conditions continued into the morning (11-29-05). Many schools were closed on both days, especially along and south of Interstate 94 in North Dakota and U.S. Highway 10 in Minnesota. For many schools, these were the first back-to-back day closures since the record winter of 1996-97. Interstate 29 was closed from Fargo to the South Dakota border, Interstate 94 was closed from Jamestown to Fergus Falls, and U.S. Highway 10 was closed from Moorhead to Detroit Lakes.

### **December 29, 2005, 8:04 PM CST – December 30, 2005, 11:57 AM CST**

The freezing rain and snow over Ransom, Sargent and Richland counties continued to move north affecting Barnes and Cass Counties. Up to a quarter inch of freezing rain was reported with snowfall amounts from 4 to 6 inches.

### **February 16, 2006, 6:00 PM CST – February 18, 2006, 4:00 AM CST**

Arctic high pressure built southeast out of western Canada, settling across eastern Montana and the central plains. Eastern North Dakota and the northwest quarter of Minnesota remained on the eastern edge of the surface high, with just enough of a surface pressure gradient to allow wind speeds to stay in the 10 to 15 mph range. On the morning of the 17<sup>th</sup>, temperatures ranged from -20F to -30 F. Only a bit of recovery occurred during the day, with temperatures peaking about -10F to -15F. This kept wind chill temperatures in the -40F to -60F range.

### **February 24, 2006, 11:26 AM CST – February 24, 2006, 6:56 PM CST**

Snowfall amounts ranged from 6 to 7 inches in northern Barnes and Cass counties to 1 to 3 inches along the south of Interstate 94.

### **December 30, 2006, 4:46 AM CST – December 31, 2006, 4:21 AM CST**

At noon on December 30th, an area of surface low pressure had set up over southern Kansas, with an inverted trough extending north from the low (from near Sioux Falls, SD, to west of Devils Lake, ND). A fairly strong temperature gradient set up across the inverted trough, with Minot,

ND, at 16F, Devils Lake at 25F, and Crookston, MN, at 32F. As moisture was transported into the colder air, intense snow bands set up over central North Dakota. By mid Saturday afternoon, the inverted trough had moved into the Red River Valley. However, temperatures still ranged in the low to mid 30s along and east of the valley. The inverted trough remained nearly stationary through midnight, which kept temperatures above freezing over most of west central

Minnesota. The heavier snow bands eventually slid into portions of eastern North Dakota. The colder temperatures took the longest to reach the southern Red River Valley, where rain changed to freezing rain and then to snow. By 3 am on December 31st, the boundary pushed into central Minnesota, and most of the precipitation ended. Snow fall was reported of 10 inches at Starkweather, Fordville, Lakota, and Valley City. There were reports of church services cancelled in some areas on the 31st and reports of many cars in the ditch.

### **February 3, 2007, 4:47 AM CST – February 3, 2007, 11:51 AM CST**

Cool surface high pressure settled into the western and central Dakotas, in the wake of a cold front. By the morning of February 3, temperatures ranged from -25F over southeast North Dakota to around -35F over northeast North Dakota. Along with northwest wind speeds at 10 to 20 mph, wind chill temperatures dipped to -40F to -55F.

### **February 24, 2007, 8:40 PM CST – February 25, 2007, 4:26 AM CST**

A Colorado Low moved across Kansas and into northern Missouri, shifted northeast into Wisconsin. To the north of this low, an inverted trough set up into the Red River Valley. Several distinct bouts of precipitation were focused into southeast North Dakota and the northwest quarter of Minnesota during this event. Precipitation initially broke out during the night of the 23rd as light freezing rain over portions of west central Minnesota, but it quickly switched over to snow. This first bout of snow brought about 6 inches to Grant, Otter Tail, and Wadena counties (MN) by noon on the 24th. Additional bands of snow fell across the area that afternoon, but the heaviest band of snow set up over Barnes, Griggs, and Steele counties, where 6 to 8 inches of snow was reported by 7 pm (24th).

### **February 27, 2007, 3:36 PM CST – February 28, 2007, 11:59 PM CST**

A Colorado Low tracked from northwest Missouri to eastern Wisconsin, while an inverted trough extended back into the Red River Valley. This brought a prolonged period of snow to eastern North Dakota and portions of northwest and west central Minnesota. The snow continued into March 1st, at which point wind speeds also increased. Blizzard conditions were reported from New Rockford to Cooperstown to Page to Wahpeton/Breckenridge.

### **March 01, 2007, 0:00 AM CST – March 2, 2007, 2:46 PM CST**

The initial winter storm warning for southeast North Dakota was issued on the afternoon of February 27th, while the winter storm warning for the rest of northeast North Dakota was issued early in the morning on February 28th. Therefore this winter storm event covers the end of February into early March. A Colorado Low tracked from northwest Missouri to eastern Wisconsin, while an inverted trough extended back into the Red River Valley. This brought a

prolonged period of snow to eastern North Dakota and portions of northwest and west central Minnesota. Many church and school activities were postponed. There were reports of several roofs caving in from the weight of the snow. Snow fall ranged from 10 to 21 inches. The snow continued into the evening of March 1st, at which point wind speeds also increased. Blizzard conditions were reported from New Rockford to Cooperstown to Page to Wahpeton/Breckenridge. Wind speeds increased from the evening of the 1st into the evening of the 2nd, causing whiteout conditions from New Rockford to Cooperstown to Page to Wahpeton/Breckenridge. Many counties advised no travel, due to zero visibility and snow drifts on roads. Many snow plows were pulled, as they could not keep up with the blowing and drifting snow. Interstate 94 was closed from Bismarck to Fargo around 5 pm on the 2nd, and remained closed through the morning of the 3rd.

### **January 17, 2008, 9:00 PM CST – January 18, 2008, 12:00 PM CST**

A cold front pushed through the area Thursday evening. The combination of cold temperatures (-10F to -20F) and winds (15 mph to 25 mph) created dangerous wind chills (-40F to -50F) across the area until the winds relaxed by Friday afternoon.

### **January 29, 2008, 3:00 AM CST – January 30, 2008, 12:00 PM CST**

A surface low tracked across North Dakota and into north central Minnesota on Monday, January 28th. A strong surface pressure gradient set up over eastern North Dakota and the northwest quarter of Minnesota as the low pushed into southwest Ontario Monday night. Cold air rushed into the area by Tuesday morning, which dropped temperatures to five below to twenty below zero, with the coldest temperatures in the Devils Lake region. Temperatures remained steady or continued to fall during the day Tuesday, with wind chills ranging from 40 below to 50 below zero. Tuesday night lows fell to the 20s below zero, with the coldest lows again around the Devils Lake region. High pressure finally built into the area on Wednesday afternoon, which allowed wind speeds to relax. Some schools cancelled classes on Tuesday, while several other schools started 2 hours late.

### **February 8, 2008, 3:37 PM CST – February 9, 2008, 12:00 PM CST**

Late in the evening of the 8th, a cold front was located along a line from the Turtle Mountains to just east of Bismarck (ND). By Saturday morning (9th), the front had moved into Minnesota, along a line from near Baudette to Detroit Lakes. Very little snow fell as the front moved through, as most locations reported an inch or less. North to northwest winds gusted from 45 to 55 mph behind the front, causing ground blizzard conditions in open country with wind chills from 25 below to 40 below zero. Snow plows were pulled in many areas, and some school events were cancelled. No travel was advised in much of eastern North Dakota.

### **February 9, 2008, 6:00 PM CST – February 10, 2008, 12:00 PM CST**

After the ground blizzard conditions that affected eastern North Dakota during the day (9th), dangerous wind chills of 40 below to 50 below zero developed. By the morning of the 10th, temperatures alone dropped to 20 below to 30 below zero. Surface high pressure moved over the area by noon, allowing wind speeds to fall below 10 mph. Power was lost in the St. Thomas,

Crystal, Edinburg, and Hoople areas around 4 am CST (10th). By the time it was restored around 745 am CST, residents reported that the temperatures inside their homes had fallen to around 60 degrees.

### **February 13, 2008, 3:58 AM CST – February 14, 2008, 3:44 AM CST**

A low pressure system tracked from southwestern North Dakota and northeastern South Dakota into southwestern Minnesota on Wednesday February 13th. A moderately heavy snow band (4 to 7 inches) developed across extreme northwest and north central North Dakota into the Devils Lake Basin. The heavy snow combined with east-northeast winds of 20 mph gusting to 35 mph by the mid-afternoon, to produce visibilities of one-half mile or less. Temperatures dropped into the 5 below to 15 below zero range through the late afternoon and early evening, and wind chills fell to 25 below to 40 below zero. The snow band progressed east-southeast into west central Minnesota, but was less intense. Some church and school activities were cancelled on Wednesday. An 89 year old man and his 83 year old wife accidentally drove into a ditch Wednesday evening about a mile from their home. They both attempted to walk the remaining distance home. They were luckily found by neighbors fairly quickly, but both of them were treated for frostbite.

### **February 19, 2008, 4:00 PM CST – February 20, 2008, 4:00 AM CST**

Record or near record cold air poured into eastern North Dakota and northwest Minnesota Tuesday (February 19th) and Tuesday night. The combination of moderate northerly winds of 15 to 25 mph and very cold temperatures produced wind chills of 40 below to 50 below zero.

### **May 27, 2008, 0:00 AM CST – May 27, 2008, 7:00 AM CST**

Surface high pressure built into the region, producing another late May freeze.

### **December 13, 2008, 4:03 AM CST – December 15, 2008, 0:04 AM CST**

A potent surface low pressure system moved out of Colorado and tracked northeast to the Minneapolis area. This created a strong temperature gradient across the northern plains, with Devils Lake at 15 below zero and the Minneapolis area around 30 above. As the system intensified over eastern Minnesota, northwest winds began to gust to around 50 mph with wind chills colder than 40 below zero. Snow accompanied the wind which created whiteout conditions for an extended period of time. A blizzard this bad had not been seen since the winter of 1996/97, so the impact on the area was tremendous. Stores closed for portions of the weekend during the busy holiday shopping season. Interstate 29 was closed in the state of North Dakota and Interstate 94 was closed from Jamestown to Alexandria, MN. No travel was advised across the area and commercial flights were cancelled into Fargo and Grand Forks. Church services, schools, and many other activities were cancelled or delayed. The town of Buffalo, ND lost power for around 8 hours. There were other minor power outages across the area as well.



### **December 15, 2008, 4:01 AM CST – December 15, 2008, 12:00 PM CST**

Northwest winds continued after blizzard due to surface high pressure building in behind the departing low. Low temperatures dipped to 10 below to 20 below zero with wind chills from 40 below to 50 below zero.

### **December 19, 2008, 4:01 AM CST – December 20, 2008, 11:36 AM CST**

An inverted trough slowly crossed eastern North Dakota and northwest Minnesota, dropping about 4 to 6 inches of snow along with 25 to 35 mph wind speeds.

### **December 20, 2008, 3:18 PM CST – December 21, 2008, 11:04 AM CST**

After the winter storm event northwest winds remained brisk as surface low pressure intensified over the Great Lakes. With temperatures remaining below zero, wind chill readings ranged from 40 below to 50 below zero.

### **December 29, 2008, 8:51 PM CST – December 30, 2:40 PM CST**

Surface low pressure tracked across South Dakota, spreading a swath of heavy snow along the Interstate 94 corridor. Most locations across this area picked up 8 to 14 inches of snow.

### **January 4, 2009, 1:00 AM CST – January 4, 2009, 7:00 PM CST**

Arctic air returned to the Northern Plains and Upper Midwest. Brisk westerly winds of 10 to 20 mph created dangerously cold wind chills across eastern North Dakota.

### **January 9, 2009, 9:32 AM CST – January 9, 2009, 2:45 PM CST**

A narrow band of 6 to 8 inches of snow fell across southwest Benson County, western Eddy County, southwest Griggs County, and northwest Barnes County.

### **January 11, 2009, 3:00 PM CST – January 12, 2009, 2:50 PM CST**

Two to 5 inches of snow fell from just west of Devils Lake down into the southern Red River Valley. The most snow, 4 to 5 inches, fell over western Barnes County, Ransom County, and western Sargent County. As north winds increased wind gusts to around 40 mph caused blizzard conditions in open country.

### **January 13, 2009, 11:00 AM CST – January 16, 2009, 2:00 AM CST**

Very cold arctic air sank into the Northern Plains. The light winds of 5 to 15 mph at times caused wind chills to run 40 to 60 below zero across much of eastern North Dakota.

### **February 8, 2009, 3:44 PM CST – February 10, 2009, 00:00 AM CST**

A Colorado Low tracked from northeast Colorado into west central Minnesota. This system pushed unseasonably warm and moist air into the northern plains, with surface dew point temperatures on the 9th rising into the 30s. As rain fell on the colder ground, surfaces quickly

became ice covered. Roughly 0.10 to 0.40 inches of ice was reported, making the morning commute on the 9th extremely treacherous. Hundreds of vehicle accidents were reported from the slick roads. Hospitals also reported many bumps and bruises from people slipping and falling. Many schools were closed on the 9th, and then began late on the 10th. Most areas did not receive their regular mail delivery.

### **February 26, 2009, 8:42 AM CST – February 26, 2009, 6:00 PM CST**

A surface low passed to the south over the central plains, but a strong upper level disturbance and upper jet combined to produce winter storm conditions along and south of Interstate 94 in North Dakota. Four to 16 inches of snow fell across the area, along with north winds of 20 to 30 mph. The most snow fell across southern Richland and Sargent counties, where amounts ranged from 10 to 16 inches. Several schools closed while others only held classes for a portion of the day. Snowplows were pulled off the roads in far southeast North Dakota, as they could not keep up with the snowfall rates.

### **March 9, 2009, 2:56 PM CST – March 11, 2009, 5:00 AM CST**

A Colorado Low located over the central Rockies tracked northeast to northern Wisconsin. One swath of heavier snow fell, mainly from Jamestown (ND) to Mayville (ND) to Red Lake Falls (MN). Snowfall amounts of 6 to 8 inches fell along this narrow band. Outside of this band, about 2 to 4 inches of snow were reported. As the system wrapped up on the 10th, a much wider swath of snow fell, along with increasing north winds. The most snow was reported along the initial snow band, with total amounts ranging from 10 to 13 inches. Outside this area, total snowfall amounts ranged from 4 to 8 inches. Maximum north wind gusts during the height of the blizzard ranged from 40 to 50 mph. Interstate 94 was closed from Jamestown to Fargo as were all of Interstate 29 in eastern North Dakota. The wind and snow produced drifts up to 10 feet high in some areas. Most schools closed early on Monday (9th), then remained closed for the next two days. The Grand Forks and Fargo airports were also closed.

### **March 29, 2009, 2:27 PM CST – March 31, 2009, 9:00 PM CST**

A Colorado Low took shape over northeast Colorado and tracked slowly to the northeast, reaching the arrowhead of Minnesota. As the low intensified, north-northeast winds became rather gusty, and made travel almost impossible. Nearly two feet of snow fell over central Wilkin County (MN). Snowfall amounts greater than a foot were very common along and south of Interstate 94 in North Dakota and Highway 10 in Minnesota. The snow had high moisture content, with over 2 inches reported over central Wilkin County. This storm, in combination with the other March storms, brought two new monthly records to the Fargo-Moorhead area. The snowfall total, 28.1 inches, broke the previous record of 26.2 inches set in 1997. The precipitation total, 4.62 inches, broke the previous record of 2.83 inches set in 1882. The snow and wind on the 31st resulted in the closure of Interstate 29 from Grand Forks to the South Dakota border. No travel was advised across most of the warning area. Many schools also closed on the 30th and 31st.

### **October 14, 2009, 8:26 PM CST – October 15, 2009, 6:00 AM CST**

An early season storm system brought a mix of rain and snow to eastern North Dakota. Most of the precipitation fell as rain, as surface temperatures near the Red River Valley warmed up to around 40 degrees. However, just to the west of the Red River Valley, across the Dazey, Valley City, and Lisbon areas, temperatures were about ten degrees colder, and most of the precipitation fell as slushy snow. Six inches of snow fell at Lisbon and Litchville and 7.5 inches fell in Valley City. The heavy, wet snow broke many tree branches and power lines, which resulted in sporadic power outages for 1500 Valley City residents. Dozens of vehicles slid into the ditch along Interstate 94 in Barnes County.

### **There have been disaster declarations and emergencies pertaining to a severe winter weather in Barnes County.**

#### **Probability**

The probability of a hazard or threat is how likely it is it will happen. Profile meeting participants and the Steering Committee indicated the probability of severe winter weather in Barnes County is highly likely, meaning that there is a 100 percent probability in the next year the hazard will occur to some extent. Per Table 4.12.1, the following statistics on the probability of severe winter weather in Barnes County is as follows:

- The probability of severe winter weather in Barnes County is 100 percent based on 179 occurrences between January 1, 1996, to December 31, 2020, resulting in approximately seven incidents of significance annually. Barnes County experiences approximately \$492,080.00 in property damage and no crop damage annually.
- No injuries or fatalities were reported between January 1, 1996, and December 31, 2020.

According to information obtained from the U.S. Dept. of Agriculture, Risk Management Agency (RMA), crop loss due to severe winter weather totals \$554,916.52 annually in Barnes County between January 1, 2001, and December 31, 2020.

#### **Extent/Magnitude**

The extent/magnitude of a hazard or threat is expressed in the amount and/or number of damages or losses either actualized in a community or estimated based on known assets and levels of risk. The extent/magnitude of the severe winter weather ranges from large blizzard with prolonged sub-zero temperatures causing widespread power outages and loss of critical facilities and infrastructure to localized icy road conditions with minor traffic accidents.

- The 1997 Ice Storm resulted in \$12,000,000.00 in property damage between April 4 and April 5 in Barnes County.
- If the partial collapse of the Winter Show Building in Valley City happened during the Winter Show(march of every year), mass fatalities would have occurred.

Profile meeting participants and the Steering Committee indicated the magnitude or impact of severe winter weather as catastrophic meaning 50 percent or more of Barnes County and its people could be affected.

**Risk Assessment**

Table 4.12.2 shows the risk assessment as determined by individual jurisdictions, the Steering Committee, and meeting participants at the profile meeting for severe winter weather. The risk assessment methodology can be found in the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA). The total in Table 4.12.2 represents the sum of each jurisdiction’s impact, frequency, likelihood, and vulnerability to a hazard/threat less the jurisdiction’s capabilities to respond to the hazard/threat.

**Table 4.12.2 – Barnes County Severe Winter Weather Risk Assessment Scored Chart Summary**

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	4	4	4	3	2	<b>13</b>
Dazey	4	4	4	4	2	<b>14</b>
Fingal	4	4	4	4	1	<b>15</b>
Kathryn	3	3	3	2	2	<b>9</b>
Leal	3	3	4	4	2	<b>12</b>
Litchville	2	3	1	2	3	<b>5</b>
Nome	3	3	3	3	1	<b>11</b>
Oriska	3	4	4	3	3	<b>11</b>
Pillsbury	3	4	4	3	1	<b>13</b>
Rogers	3	3	4	4	2	<b>12</b>
Sanborn	4	3	4	3	1	<b>13</b>
Sibley	4	4	4	3	1	<b>14</b>
Valley City	3	4	4	2	3	<b>10</b>
Wimbledon	4	4	4	3	2	<b>13</b>

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 4.12.3 provides information on the specific impact, frequency, likelihood, vulnerability, and capability of severe winter weather in Barnes County. A list of impacts identified as commonplace for natural hazards and man-made threats regardless of the jurisdiction is shown in Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA).

**Table 4.12.3 – Barnes County Severe Winter Weather Risk Assessment**

<p><b>Impact</b></p>	<ul style="list-style-type: none"> <li>• Delayed Emergency Response</li> <li>• Human Injury/Death</li> <li>• Livestock Loss</li> <li>• Loss of Power/Downed Power lines</li> <li>• Limited mobility of local employers and employees/general population</li> <li>• Saturation of roadways annually due to inadequate/blocked drainage of snow melt</li> <li>• Restricted access for emergency services from snow blocking roads</li> <li>• Loss of Economy</li> <li>• Increased isolation of rural residents/small communities</li> <li>• Severe low temperatures may increase utility costs</li> <li>• Increased cost for fuel for snow removal during large snow events</li> <li>• Highways can become icy reducing mobility speeds</li> <li>• Heavy snow causing spring melting and potential flooding</li> <li>• Disruption in economic activity and transportation routes moving goods and people, and provided services</li> <li>• Increased difficulty in mobility of general population may result in missed work or school</li> <li>• May contribute to shortage or outage of critical materials and infrastructure due to limited mobility from blocked roads and restrict delivery of commodities and products to the marketplace</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Blocked Roads: see map from Kerry.</b></li> <li>• Additional calls for emergency services may strain resources</li> <li>• Sheltering stranded people</li> <li>• All county and city roads are impacted by severe winter weather, depending on wind direction and quantity of snow received and duration of the incident</li> <li>• <b>Barnes County experiences approximately \$492,080.00 in property damage and no crop damage annually from NCDC/NOAA.</b></li> <li>• Per crop loss information obtained from the U.S. Dept. of Agriculture, Risk Management Agency (RMA), crop loss due to severe summer weather totals \$554,916.52 annually in Barnes County.</li> <li>• <b>Temporary economic boost due to rebuilding/repairs of homes, businesses and other structures.</b></li> </ul>
<p><b>Frequency</b></p>	<ul style="list-style-type: none"> <li>• Multiple occurrences of blizzard, extreme cold, and heavy snow annually</li> <li>• Annual occurrences of power loss from ice storms</li> <li>• March 2017 snowstorm resulted in blocked roads all over the county and in city limits</li> <li>• Blizzard conditions, heavy snow, extreme wind chill occur each year</li> </ul>	<ul style="list-style-type: none"> <li>• Strong winds are commonplace</li> <li>• Occurrences of blocked roads from heavy snow occurs frequently</li> <li>• <b>179 occurrences between January 1, 1996, and December 31, 2020, resulting in a probability of 100 percent.</b></li> </ul>

Table 4.12.3 – Barnes County Severe Winter Weather Risk Assessment – Continued

Likelihood	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> </ul>	
Vulnerability	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Lack of permanent generators at critical facilities and infrastructure</li> <li>• Aging infrastructure (roads, water, electrical systems)</li> <li>• Short staffing of local employers and employees/general population</li> <li>• Townships do not have equipment to clear roads and rely on farmers, Barnes County Highway Department, and private contractors</li> <li>• Low-lying roads shut down from snow accumulation</li> <li>• Longer response times from emergency services</li> <li>• Stranded motorists</li> <li>• <b>Some township roads lack signage for navigation</b></li> <li>• <b>County lacks time required to adequately respond to above average snow precipitation and accumulation</b></li> <li>• Increased removal of shelterbelts allows more ground blizzard conditions</li> <li>• Some township roads lack signage for navigation for emergency services and first responders in rural areas</li> <li>• <b>Improper placement of existing shelter belts adjacent to roadways contributes to blockage</b></li> <li>• <b>Lack of storm water systems in some communities may contribute to overland flooding during spring thaw</b></li> <li>• Critical facilities: CHI-Mercy Hospital, Barnes County Correctional Center, Barnes County Courthouse, Barnes County Law Enforcement Center, Barnes County Hwy Dept. Headquarters, NDDOT District Office and shops, Valley City City Hall, all fire halls and ambulance buildings county-wide</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Building Codes</li> <li>• Advanced warning and notification such as internet and TV</li> <li>• Switching of overhead power lines to underground – change to fiber-optic lines</li> <li>• Independent work ethic of local populations</li> <li>• County has adequate equipment for clearing roads during typical winter storm events</li> <li>• Better weather alerts and education of residents through internet, TV and cable</li> <li>• <b>Increased awareness through Barnes County Everbridge</b></li> <li>• <b>Presence of social media alerting to the public</b></li> <li>• <b>County highway department and NDDOT will assist ambulances to calls in rural areas during incidents of severe winter weather</b></li> <li>• <b>Barnes County Highway Department is on-call during blizzard warnings</b></li> <li>• <b>Appropriately positioned living snow fences</b></li> <li>• <b>Barnes County Highway Department and NDDOT have cut down slopes of roadways to mitigation accumulation of snow</b></li> </ul>

**Table 4.12.3 – Barnes County Severe Winter Weather Risk Assessment - Continued**

<p><b>Capability</b></p>	<p><u>Administrative and Technical</u></p> <ul style="list-style-type: none"> <li>• Active county commission</li> <li>• Contract for engineering, planning, and grant writing</li> <li>• GIS services provided by the state and county</li> <li>• Full-time emergency manager</li> <li>• Relies on county, state and other agencies for emergency assistance</li> <li>• Sheriff’s Office regulates weight and size of trucks traversing county roads</li> <li>• County has county-wide mutual aid agreement for emergency services</li> <li>• Full-time county highway superintendent and department staff</li> <li>• Full-time public works department in the city of Valley City</li> <li>• Barnes County Sheriff’s Office</li> <li>• Valley City Police Department</li> <li>• All county fire departments and ambulance services</li> <li>• City of Valley City has a full-time building code inspector</li> <li>• County zoning administrator providing building inspection services to smaller jurisdictions</li> <li>• <b>Barnes County Everbridge</b></li> <li>• <b>NDDOT office in Barnes County (Valley City)</b></li> <li>• <b>N.D. Highway Patrol (three based in Barnes County)</b></li> </ul> <p><u>Education and Outreach</u></p> <ul style="list-style-type: none"> <li>• Active emergency management department with education and outreach on county website and social media</li> <li>• Valley City Police Department and Fire Department have social media accounts</li> <li>• Education programs at local schools</li> </ul>	<p><u>Financial</u></p> <ul style="list-style-type: none"> <li>• Funding provided through county commission, NDDOT, and federal sources</li> <li>• Utilizes financial assistance from FEMA for federally declared disasters</li> </ul> <p><u>Planning and Regulatory</u></p> <ul style="list-style-type: none"> <li>• Maintains capital improvements project list and project funding sources</li> <li>• Sheriff’s Office regulates weight and size of trucks traversing county roads</li> <li>• County and city of Valley City has zoning and ordinances in place to regulate development</li> <li>• County and city of Valley City has adopted building codes and has flooding ordinances.</li> <li>• County zoning administrator providing building inspection services to smaller jurisdictions</li> <li>• Some townships have building code enforcement.</li> <li>• NDDOT design criteria and regulation guidelines for construction of and improvements to roads</li> <li>• County and city have full-time zoning administrator</li> </ul>
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### **Vulnerabilities to Publicly-Owned Buildings and Property**

Most publicly-owned buildings and property remain unaffected by impacts from severe winter weather. Damage occurs from heavy snow, frozen pipes, power outages or potential damage to structural foundations from freezing and thawing of soil. Roof collapses are the biggest single-event on property resulting from heavy snow loads that can result in the loss of life. Heavy snow can also block sewer vents on single-family homes which can cause fatalities.

A summary of publicly-owned buildings is provided in Chapter 3, Profile and Inventory.

### **Vulnerabilities of Critical Facilities and Infrastructure**

The greatest issues for critical facilities and infrastructure resulting from severe winter weather impacts are inaccessibility due to blocked roads, and utility and power outages. The Barnes County Courthouse, Barnes County Law Enforcement Center, CHI-Mercy Hospital, schools, lift stations and numerous critical facilities and infrastructure in Barnes County should upgrade existing generators or install new generators to maintain power, if not done so already. See Chapter 6, Mitigation Strategy for a list of generators needed throughout the county.

Power. Critical facilities with backup generators are better equipped to handle impacts from severe winter weather if loss of power does occur. Suspended power lines are highly susceptible to high winds and subsequent fallen tree branches, other debris or accumulation of ice, leading to power outages. Restoration of power can take several days or a week. All jurisdictions in the county have experienced power outages during severe winter weather to varying degrees of severity.

Road. The greatest issue for critical facilities and infrastructure is maintenance of the road system during severe winter weather. Emergency services can have trouble responding during power outages and are limited in responding to emergencies when roads are blocked from snow drifts. During blizzards or snowstorms, cars and trucks can become stranded if roads are blocked with heavy snow and ice. When Interstate 94 is closed, smart phone technology redirects interstate traffic to state highways and county roads resulting in stranded motorists. Response times for emergency services can also be prolonged and prevent access to communities. Prolonged closures of roads can threaten propane, fuel and food supplies, and medical supplies.

Sanitary Sewer. Sanitary sewer systems can fail causing sewer backup resulting in property damage if prolonged power loss occurs and lift stations fail.

Water. Disruptions in drinking/potable water service can be caused by physical damage to water towers or lift stations, or a loss of power. Delivery of water to jurisdictions can be interrupted by water main breakage resulting from freeze and thaw cycles.

### **Vulnerabilities to New and Future Development**

New and future development could be seriously impacted by severe winter weather in jurisdictions that lack building codes and/or enforcement. Homes and businesses lacking the capability of supporting heavy snow loads could experience roof collapse. Jurisdictions without building codes and/or enforcement should have improved construction methods to better withstand severe winter weather.



Street design also plays an important role in vulnerability to severe winter weather. New and future development developed in a “suburban style” manner containing curvilinear roads and cul-de-sacs are more susceptible to severe winter weather impacts. Snow removal on these roadways has proven difficult and raises the potential for blocked roads and limits access for emergency services. Maintaining a high level of connectivity, which is defined as how often streets or roadways intersect, can increase the ease of snow removal and lessen the impact of blocked roads and maintain access for emergency services.

Increases in population further complicate matters when dealing with severe winter weather. An example of this would be higher numbers of people susceptible to vehicle accidents on icy or blocked roads, health hazards due to wind chill and extreme cold, etc. Conversely, increases in populations in existing jurisdictions may lessen the risk to impacts from severe winter weather as it leads to less isolated populations and increases the number of people reachable by emergency services during an emergency.

### **Data Limitations**

Residents often experience impacts from severe winter weather, such as minor structural damage, increased utilities, loss of livestock, frozen water lines, but do not report.

#### National Climatic Data Center/National Oceanic and Atmospheric Administration

The hazard history provided through the National Climatic Data Center/National Oceanic Atmospheric Administration’s Storm Events Database contains data as entered by NOAA's National Weather Service (NWS). Due to changes in the data collection and processing procedures over time, there are unique periods of record available depending on the event type. The following timelines show the different time spans for each period of unique data collection and processing procedures. **Severe winter weather was not recorded as a separate incident until 1996.**

- 1. Tornado:** From 1950 through 1954, only tornado events were recorded.
- 2. Tornado, Thunderstorm Wind and Hail:** From 1955 through 1992, only tornado, thunderstorm wind and hail events were keyed from the paper publications into digital data. From 1993 to 1995, only tornado, thunderstorm wind and hail events have been extracted from the Unformatted Text Files.
- 3. All Event Types (48 from Directive 10-1605):** From 1996 to present, 48 event types are recorded as defined in NWS Directive 10-1605.

#### U.S. Dept. of Agriculture, Farm Services Agency

The Livestock Indemnity Program (LIP) provides financial assistance to local producers that experience livestock losses. The program does not provide the cause of loss and, therefore, an accurate description of livestock loss from severe winter weather cannot be identified.

#### U.S. Dept. of Agriculture, Risk Management Agency

One of the Cause of Loss categories for crop loss data from the U.S.D.A.-RMA is titled Other (snow, lightning, etc.) combines elements of severe summer weather and severe winter weather. Therefore, crop loss data for any given jurisdiction is incomplete.

### Other Key Documents

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following documents.

- 2018 N.D. Enhanced Mitigation MAOP
- Barnes County Local Emergency Operations Plan
- Barnes County Threat and Hazard Identification and Risk Assessment (THIRA)
- Building Codes
- North Dakota Continuity of Operations Plan
- North Dakota Dept. of Transportation Design Manual
- North Dakota Emergency Operations Plan, Severe Winter Weather Annex
- North Dakota League of Cities: Planning and Zoning Handbook
- North Dakota State Building Code
- North Dakota State Disaster Recovery Plan
- North Dakota State Preparedness Report (SPR)
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

## 4.13 Space Weather

Conditions in space that affects Earth and its digital/technological and infrastructure systems.

### Characteristics

Space Weather is a consequence of activity on the sun, the Earth's magnetic field and atmosphere, and the Earth's location in the solar system. These storms originate from the sun and occur in space near Earth or its atmosphere. Disruptions are primarily categorized into three types of events: geomagnetic storm, solar flares, and solar radiation storms. The storms can affect critical facilities and infrastructure, and technology in many ways, including blackouts, high-frequency radio disruptions, and interference with satellite navigation.

**Geomagnetic Storm** is a major disturbance of Earth's magnetosphere that occurs when there is a very efficient exchange of energy from the solar wind into the space environment surrounding Earth.

**Solar Flares** are large eruptions of electromagnetic radiation from the sun lasting from minutes to hours. The sudden outburst of electromagnetic energy travels at the speed of light, therefore, any effect upon the sunlit side of Earth's exposed outer atmosphere occurs at the same time the event is observed.

**Solar Radiation Storms** occur when a large-scale magnetic eruption, often causing a coronal mass ejection (CME) and associated solar flare, accelerates charged particles in the solar atmosphere to very high velocities.

<b>Seasonal Pattern</b>	None.
<b>Duration</b>	Minutes. Secondary impacts could last hours, days, weeks, months or even years.
<b>Speed of Onset</b>	Immediate identification from NOAA Space Weather Prediction Center; 8 minutes to reach the Earth.
<b>Location</b>	Total geographic extent of Barnes County.

For more information regarding space weather please reference the **2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)**. The state plan can be accessed by following the electronic hyperlink or link to the N.D. Dept. of Emergency Services website:

[2018 North Dakota Enhanced Mitigation Mission Area Operations Plan](#)

<https://www.des.nd.gov/planning>

### History

According to the 2018 N.D. Enhanced Mission Area Operations Plan (MAOP), there are no recorded catastrophic space weather events impacting North Dakota. However, the following events from other locations provide insight.

- The nearest recorded event affected Montreal, Quebec, Canada on March 13, 1989, when a geomagnetic storm took out their commercial electric power for nine hours. The storm impacted six million people.

- The largest geomagnetic storm in modern recorded history is named the Carrington Event. The solar super storm occurred on September 1st and 2nd, 1859, and impacted telegraph systems across Europe and North America. Auroras were recorded as far south as the Caribbean in the northern hemisphere.

### **Probability**

The probability of space weather is 100 percent as the hazard is a natural phenomenon uncontrollable by humans and will occur at some point in the future. The 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP) documented six occurrences impacting Earth.

Profile meeting participants ranked the probability of space weather as possible, meaning that there is between a one and 10 percent chance of an occurrence in the next year.

### **Extent/Magnitude**

The extent/magnitude of a hazard or threat is expressed in the amount and/or number of damages or losses either actualized in a community or estimated based on known assets and levels of risk. The extent/magnitude of space weather can range from minimal to catastrophic. The National Oceanic and Atmospheric Administration Space Weather Prediction Center has created scales to communicate impacts on people and technologies from the hazard to the public. The scales have numbered levels of one to five, like other measurement scales for natural hazards such as tornadoes and hurricanes. The scales rate the severity of possible effects of space weather. The magnitude of a space weather event can range from extreme (radio blackout on the entire sunlit side of the earth or outages in maritime and aviation systems) to minor (slight degradation of radio communication or navigation signals).

Profile meeting participants indicated the magnitude or impact of space weather as catastrophic meaning 50 percent or more of Barnes County and its people could be affected.

### **Vulnerabilities to Publicly-Owned Buildings and Property**

The physical integrity of publicly-owned buildings would not be impacted directly from space weather, but secondary impacts such as loss of electric power or technological/data systems could affect operations. Secondary impacts resulting from loss of power include loss of heat during severe winter weather, which could result in frozen and burst water pipes causing widespread interior damage, sewer backups, and subsequent flooding, or loss of digital assets from damaged servers and other telecommunications infrastructure. Conversely, loss of power from a space weather event could compromise cooling systems during severe summer weather, which could result in server rooms overheating and shutting down either temporarily or permanently. The interdependency of electricity with the operation of publicly-owned buildings and property can lead to more complex issues and prolonged outages.

A summary of publicly-owned buildings and property in Barnes County is provided in Chapter 3, Profile and Inventory.

### **Vulnerabilities of Critical Facilities and Infrastructure**

Critical facilities such as the Barnes County Correctional Center, Barnes County Courthouse, Barnes County Law Enforcement Center, Barnes County Highway Department, City-County Health, Valley City

City Hall and public works buildings, Valley City Police Department, CHI Mercy Health Valley City, Valley City State University, public schools, and other specialty facilities such as nursing homes/assisted living facilities are vulnerable to space weather in a similar fashion to publicly-owned buildings and property. The Barnes County Correctional Center, Barnes County Courthouse and the Barnes County Law Enforcement Center have a specific vulnerability to space weather as prolonged outages of power and data/technological systems could compromise security and lead to a potential breakdown of order within a facility and endanger the city of Valley City and greater Barnes County. Communication and utility infrastructure would also be disrupted from loss of power from space weather compromising the capabilities of emergency services and public and private sectors. The interdependency of electricity with the operation of critical facilities and infrastructure can lead to more complex issues and prolonged outages.

### **Vulnerabilities to New and Future Development**

As populations grow, more people are at risk to impacts from space weather such as those described in vulnerabilities to publicly-owned buildings and property, and critical facilities and infrastructure. A breakdown of population trends and projections by jurisdiction in Barnes County is shown in Chapter 3, Profile and Inventory, and Chapter 8, Jurisdictions.

Installation of faraday cages/shields at specific locations and/or equipment such as digital/technological systems for buildings (both public and private) and sewer backup valves at critical facilities and infrastructure should be considered for new and future development, but also for existing publicly-owned buildings and property, and critical facilities and infrastructure. Investment in power grid system redundancies can also mitigate the impacts of space weather.

### **Data Limitations**

Power and digital/technological system outages, whether brief or prolonged, occur on a regular basis across North Dakota and Barnes County. Since these events are not considered normal for critical facilities and infrastructure and are caused by other hazards such as severe summer or winter weather, identification of the role space weather is limited. An analysis of each critical facility and infrastructure would be needed to identify specific vulnerabilities from space weather.

### **Other Key Documents**

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following documents.

- 2018 N.D. Enhanced Mitigation MAOP
- Barnes County Local Emergency Operations Plan
- Barnes County Threat and Hazard Identification and Risk Assessment (THIRA)
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan, Space Weather Annex
- North Dakota State Disaster Recovery Plan
- North Dakota State Preparedness Report (SPR)
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

## Risk Assessment

Table 4.13.1 shows the risk assessment as determined by individual jurisdictions, the Steering Committee, and meeting participants at the profile meeting for space weather. The risk assessment methodology can be found in the beginning of Chapter 5, Threat and Hazard Identification Risk Assessment. The total in Table 4.13.1 represents the sum of each jurisdiction's impact, frequency, likelihood, and vulnerability to a hazard/threat less the jurisdiction's capabilities to respond to the hazard/threat.

**Table 4.13.1 – Barnes County Space Weather Risk Assessment Scored Chart Summary**

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	4	2	2	4	2	<b>10</b>
City of Dazey	4	1	2	2	1	<b>8</b>
City of Fingal	4	1	2	2	1	<b>8</b>
City of Kathryn	4	1	2	2	1	<b>8</b>
City of Leal	4	1	2	2	1	<b>8</b>
City of Litchville	4	1	2	2	1	<b>8</b>
City of Nome	4	1	2	2	1	<b>8</b>
City of Oriska	4	1	2	2	1	<b>8</b>
City of Pillsbury	4	1	2	2	1	<b>8</b>
City of Rogers	4	1	2	2	1	<b>8</b>
City of Sanborn	4	1	2	2	1	<b>8</b>
City of Sibley	4	1	2	2	1	<b>8</b>
City of Valley City	4	4	2	2	1	<b>11</b>
City of Wimbledon	4	1	2	2	1	<b>8</b>

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 4.13.2 provides information on the specific impact, frequency, likelihood, vulnerability, and capability of space weather in Barnes County. A list of impacts identified as commonplace for natural hazards and man-made threats regardless of the jurisdiction is shown in Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA).

**Table 4.13.2 – Barnes County Space Weather Risk Assessment**

<p><b>Impact</b></p>	<ul style="list-style-type: none"> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Explosion</li> <li>• Financial Hardship (Private and Public)</li> <li>• Government Interruptions</li> <li>• HAZMAT Release</li> <li>• Human Injury/Death</li> <li>• Increased Fire Potential</li> <li>• Increased Public Safety Runs</li> <li>• Infrastructure Degradation</li> <li>• Labor Shortages</li> <li>• Loss of Communications</li> <li>• Loss of Economy</li> <li>• Loss/Overcrowded Medical Facilities</li> <li>• Loss/Overcrowded Veterinarian Facilities</li> <li>• Loss of Potable Water</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of Power/Electricity Outage</li> <li>• Loss of Transportation Accessibility</li> <li>• Mass Casualties/Fatalities</li> <li>• Property Damage (Structure, Equipment &amp; Vehicle)</li> <li>• Public Distress/Social Discord</li> <li>• School Closure</li> <li>• Sewer Backup</li> <li>• Sheltering of Displaced Populations</li> <li>• Utility Outage/Shortage</li> <li>• <b>Loss of digital infrastructure at Barnes County Courthouse/Law Enforcement Center, hospitals, public schools, and other specialty facilities such as nursing homes and senior housing facilities</b></li> </ul>
<p><b>Frequency</b></p>	<ul style="list-style-type: none"> <li>• Never a recorded occurrence in Barnes County or North Dakota</li> </ul>	<ul style="list-style-type: none"> <li>• The nearest recorded event affected Montreal, Quebec, Canada on March 13, 1989, when a geomagnetic storm took out their commercial electric power for nine hours. The storm impacted six million people.</li> </ul>
<p><b>Likelihood</b></p>	<ul style="list-style-type: none"> <li>• Dependent on solar activity and the 11-year solar cycle</li> </ul>	<ul style="list-style-type: none"> <li>• Likely to occur once every 500 years per the 2018 N.D. Enhanced Mitigation MAOP</li> </ul>
<p><b>Vulnerability</b></p>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV – over-reliance on these systems to support society</li> <li>• Increasing dependency of digital/technological systems in agriculture, private and public sectors</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet &amp; TV</li> <li>• Local food production/households with gardens</li> <li>• Gas-powered backup generators for critical facilities and infrastructure</li> </ul>
<p><b>Capability</b></p>	<ul style="list-style-type: none"> <li>• See Chapter 7 for a list of capabilities to address space weather.</li> </ul>	

## 4.14 Transportation Incident

Including aircraft, bicycle, boat, bus, motorcycle, pedestrian, railway, truck, automobile vehicle, and recreational vehicle (ATV, side-by-side, etc.) incidents.

### Characteristics

A transportation incident is any small or large-scale aircraft, bicycle, boat, bus, motorcycle, pedestrian, railway, truck, automobile vehicle, and recreational vehicle (ATV, side-by-side, etc.) involving mass casualties. Mass casualties can be defined as an incident resulting in many deaths and/or injuries that reach a magnitude that overtaxes the response abilities of local resources. In most disasters, death and injury represent one of the hazard impacts. In transportation incidents, mass casualties and/or resulting evacuations or hazardous material releases are often the primary impact and focus of the event.

Transportation incidents occur with little or no warning. They involve many people and require special types of equipment and emergency medical personnel. Such incidents not only affect people with significant numbers of deaths/injuries, but also cause traffic problems, property damage, or even a hazardous material release and/or explosion. The probability is increased during winter storms, periods of poor visibility from snow, smoke, or dust; festivities with more opportunities for drinking and driving; harvest season, and times of increased traffic volume. The agricultural and energy economy of the region also increases the opportunity for the release of hazardous materials in a transportation incident.

<b>Seasonal Pattern</b>	None. Prevalent with the agriculture and energy sectors.
<b>Duration</b>	Minutes/hours/days/weeks/months/years – depending on extent of the incident
<b>Speed of Onset</b>	Little to no warning
<b>Location</b>	Total geographic extent of the Barnes County with a focus on N.D. Highways 1, 9, 26, 32, and 46, Interstate 94, railroads, county and township roads, the Barnes County Municipal Airport, BNSF and CP Railway, and boating/recreational traffic on Lake Ashtabula and bodies of water.

For more information regarding transportation incident please reference the **2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)**. The state plan can be accessed by following the electronic hyperlink or link to the N.D. Dept. of Emergency Services website:

[2018 North Dakota Enhanced Mitigation Mission Area Operations Plan](#)

<https://www.des.nd.gov/planning>

### History

Per the profile meeting participants, traffic incidents with minor damage or injuries occur almost daily in Barnes County (primarily in and around the city of Valley City). Incidents involving cars and farm equipment occur annually as well. The following incident history was gathered from newspaper articles and was included from the 2015 Barnes County MHMP.



- **June 2, 2010.** The rollover of a semi-tractor trailer near Pillsbury on 6/1/10 drew a hazardous materials team to the scene. Farm chemicals carried by the vehicle never spilled. The truck rolled over in a ditch on State Highway 32 about a mile south of Pillsbury. The driver was treated for minor injuries. (Source: Valley City Times-Record)
- **July 22, 2010.** One-vehicle accident on 7/21/10 on I-94 westbound between mile markers 276 and 278. One woman was transported to an unknown hospital for injuries. (Source: Valley City Times-Record)
- **October 27, 2010.** A rollover was reported near the Oakes Interchange on I-94. One person was taken to a hospital by ambulance. (Source: Valley City Times-Record)
- **November 18, 2010.** One person critically injured in a three-vehicle accident on I94 at mile marker 299. (Source: Valley City Times-Record)
- **January 26, 2011.** Two vehicle accident. Due to speed and icy conditions a vehicle slid through an intersection with a yield sign on 7th Ave NW, the right side of his car was struck by another vehicle, the first vehicle spun and went into a snowbank. (Source: Valley City Times-Record)
- **October 18, 2011.** A 3-year-old boy was killed in an accident near Spiritwood. According to the sheriff the boy had been playing in a parked truck when it slipped out of gear. The boy fell from the vehicle and it rolled over him. He was dead at the scene. (Source: Valley City Times-Record)
- **December 27, 2011.** Seven railcars carrying soybeans went off the tracks near Valley City. Cause not determined. No hazardous material was being transported. (Source: Valley City Times-Record)
- **February 21, 2012.** A blast of winter weather that blew through the region caused 17 vehicles to slide into the ditch in or near Barnes County, as well as five two-car accidents. Two vehicles collided on State Hwy 1 about six miles south of the interstate. The driver of the Grand AM that crossed the centerline into southbound traffic was dead at the scene. The other driver and four passengers were injured. (Source: Valley City Times-Record)
- **February 27, 2012.** One person killed in a single vehicle accident. The vehicle entered the ditch and continued southbound before striking an approach and being sent airborne. The truck landed south of the approach and struck a utility pole with its front-left corner causing it to spin and roll. The driver was taken to Mercy Hospital, then airlifted to Sanford Hospital in Fargo where he died of his injuries. (Source: Valley City Times-Record)
- **March 5, 2012.** In all, 29 vehicles slid into ditches and interstate medians and seven rollovers were reported in Barnes County. Valley City Fire Department rescue squad, Barnes County Sheriff's office, Barnes County Ambulance and the ND Highway Patrol responded to a multiple vehicle pile-up in the median of I-94 between exit 296 and 298 on 3/2/12. (Source: Valley City Times-Record)

- **March 16-18, 2012.** Pickup rear ended and totaled by a semi in the eastbound lane of I94, mile marker 300. The pickup was going about 45 m.p.h. when the semi rear ended them. The semi received minor damage. One person was injured. (Source: Valley City Times-Record)
- **April 26, 2012.** A roll-over accident with one injured person trapped inside the car. The vehicle had been northbound on 5th Ave and struck the back of a parked vehicle. A bystander extricated the driver from the still running vehicle saving the driver from worse injury. (Source: Valley City Times-Record)
- **August 7, 2012.** A Digger, large vehicle, blew a front right tire, left I-94 one mile west of Tower City, crossed over a frontage road and smashed into a small grove of trees. There were no injuries. (Source: Valley City Times-Record)
- **August 8, 2012.** No one was injured in a one-vehicle accident on I-94 at milepost 306. Semi driver had front right tire of the vehicle blow, causing loss of control of the vehicle, swerved right and left on the roadway and entered the south ditch. While the vehicle did not overturn, it vaulted a gravel frontage road and hit a plow parked near a grove of trees on private property. (Source: Valley City Times-Record)
- **February 6, 2013.** Single vehicle accident. There was compacted ice on the road, driver lost control, over-corrected, entered the median and rolled. The driver and her two children received minor injuries. (Source: Valley City Times-Record)
- **February 20, 2013.** The captain for ND Highway Patrol southeast region said on 2/18/13, a no travel advisory was issued in the Valley City and surrounding areas due to blowing snow causing near zero visibility. The captain said "we probably had 15 crashes and 40 to 50 vehicles in the ditch, so then we had to respond to them in no visibility conditions." Cops say for your safety and the safety of others don't travel when no travel is advised. (Source: Valley City Times-Record)
- **March 26, 2013.** (3/20/14) Two people have died because of injuries received in a one-car rollover accident on I94 west of Valley City on Wednesday. The accident occurred as they were driving through a portion of the roadway covered in ice by Hobart Lake, lost control of the vehicle, spun into the median and rolled. (Source: Valley City Times-Record)
- **March 26, 2013.** One-vehicle crash has claimed the life of a Marion man. Driver lost control, entered the south ditch of rural 56th St, and came to rest on its passenger side facing south. The driver was ejected from the vehicle, treated for non-life-threatening injuries and charged with a DUI. (Source: Valley City Times-Record)
- **April 17, 2013.** Montana man injured in a single car accident near Valley City. Cruise control was set at 65 and vehicle slid on ice and compacted snow, overcorrected and overturned in the median. (Source: Valley City Times-Record)

- **July 16, 2013.** A MN motor coach bus went off an I94 exit ramp in Valley City and crashed into a field, injuring five of its 14 passengers. The driver attempted to slow the bus as he exited the interstate at exit number 292, but the foot brake had little or no effect. The driver attempted to steer onto a paved road, but the bus continued to the east ditch, impacted the embankment and came to rest about 150 yards SW of the interchange in a field. The bus did not overturn. (Source: Valley City Times-Record)
- **August 19, 2013.** Multiple vehicle crash, two seriously injured on East Main Street and 2nd Ave on 8/16/13. The crash involved seven cars and five drivers. Minor injuries were reported from occupants of the other cars. Witness reported the truck moving at a high rate of speed driving in the center of the street then veering into the left lane. The truck struck the Impala traveling eastbound on Main Street preparing to turn north onto 2nd Ave NW. The impact propelled both vehicles into several other vehicle, both occupied and unoccupied. Both women were extricated by the Valley City Fire and Rescue, transported to Mercy Hospital and later air-lifted to Sanford Hospital in Fargo. Both women succumbed to their injuries. The crash is under investigation. (Source: Valley City Times-Record)
- **October 10, 2013.** One person killed when a single car entered a ditch and rolled on Barnes County Road 38, about half a mile from Litchville. The driver was ejected from the vehicle. Responding agencies included the Barnes County Ambulance, ND Highway Patrol, Litchville First Responders and the Valley City Ambulance. (Source: Valley City Times-Record)
- **June 22, 2014.** A 92-year-old woman was struck by a car on Sunday evening in Valley City. She was airlifted to a Fargo hospital to be treated for her injuries. The crash happened just after 6 p.m., Sunday as the woman was cross the street. The driver of the vehicle was turning left from Central Avenue North onto Sixth Street Northwest. He did not see the woman in the street and hit her and she died. Speed nor alcohol was a factor. (Source: Valley City Times-Record)
- **February 18, 2014.** A man was injured in a single car rollover accident near Spiritwood. (Source: Valley City Times-Record)
- **July 24, 2014.** A crash occurred between two semis on Interstate 94 about six miles from Valley City. The crash caused one semi to catch fire and left both drives with minor injuries. The driver of one semi was driving too close to the other and was distracted by a passing vehicle, resulting in a rear-end collision. (Source: Valley City Times-Record)

Table 4.14.1 shows crash data provided by the N.D. Dept. of Transportation and is for crashes occurring on state highway and Interstate 94 in Barnes County between 2005 and 2020. The following are key points from Table 4.14.1.

- Between 2005 and 2020, Barnes County experienced 4,020 total crashes of which 3,267 were property damage only crashes, 677 were injury crashes resulting in 900 injuries, and 34 were fatal crashes resulting in 39 fatalities. Approximately 81.3 percent of crashes were property-damage only.

- On average, Barnes County experiences 204 property-damage only crashes, 42 injury crashes, 60 injuries, two fatal crashes, and three fatalities annually between 2005 and 2020, or 251 total crashes annually.
- Property-damage only crashes declined 57.3 percent from 255 crashes in 2005 to 109 crashes in 2020. Property damage-only crashes peaked at 295 in 2009.
- The highest number of fatal crashes and total fatalities were recorded in 2006 with five crashes and seven fatalities.

**Table 4.14.1 – 2005 to 2020 Barnes County, N.D. Crash Summary**

Year	Property Damage Only (PDO)	Injury Crashes	Total Injuries	Fatal Crashes	Total Fatalities	Total Crashes
2005	255	1	--	--	--	298
2006	222	35	60	5	7	262
2007	219	27	37	1	1	247
2008	197	26	42	3	3	226
2009	295	54	77	1	1	350
2010	239	52	71	1	1	292
2011	260	48	3	1	1	309
2012	219	46	74	3	3	268
2013	285	73	106	4	6	362
2014	156	40	50	3	3	199
2015	134	47	72	3	3	184
2016	150	54	75	2	2	206
2017	165	45	62	2	3	212
2018	204	40	55	2	2	246
2019	158	42	56	2	2	202
2020	109	47	60	1	1	157
<b>TOTAL</b>	<b>3,267</b>	<b>677</b>	<b>900</b>	<b>34</b>	<b>39</b>	<b>4,020</b>

Source(s): N.D. Dept. of Transportation

#### Aircraft

Barnes County Emergency Management and the Barnes County Municipal Airport Manager provided the following information regarding aircraft incidents in Barnes County:

- **September 7, 2012.** An airplane was practicing for the airshow. The aircraft stalled and crashed in the airport airfield killing the pilot.
- **August 2016.** A crop plane was flying near the city of Sanborn. The plane's engine failed and the pilot tried to set the plane down in an open field. The plane clipped the corn field and flipped over and crashed into a slough. The pilot was injured but survived.

#### Railroad

Barnes County Emergency Management and the Barnes County Sheriff's Office provided the following information regarding railroad incidents in Barnes County:

- **August 2020.** A CP Railway train derailed at the railroad crossing with Barnes County Road 21

north of Valley City. The cars were empty so no injuries/fatalities or release of hazardous materials occurred. The derailment blocked Barnes County Road 21 for a day.

### **Probability**

The probability of a hazard or threat is how likely it is it will happen. Per the N.D. Dept. of Transportation, on average Barnes County experiences 204 property-damage only crashes, 42 injury crashes, 60 injuries, two fatal crashes, and three fatalities annually between 2005 and 2020.

The Barnes County Municipal Airport provides local general aviation and no commercial passenger jet service. Therefore, the probability of an aircraft accident involving civilian passengers from the airport is zero in Barnes County. However, the prevalence of general aviation traffic, crop spraying, flights from UND, AirMed, and the aerobatic training box increases the probability of an aircraft incident in Barnes County.

According to the 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP), transportation incidents can occur because of other hazards, like flooding or severe weather. The Canadian Pacific Railway's operations are regularly interrupted from flooded conditions. One of these areas is at Valley City along the Sheyenne River.

Given the history of transportation incidents, profile meeting participants indicated the probability of a vehicular transportation incident in Barnes County is highly likely, meaning that there is a 100 percent probability in the next year of an incident. Transportation incidents involving aircraft, trains, and other modes of transportation are occasional.

### **Extent/Magnitude**

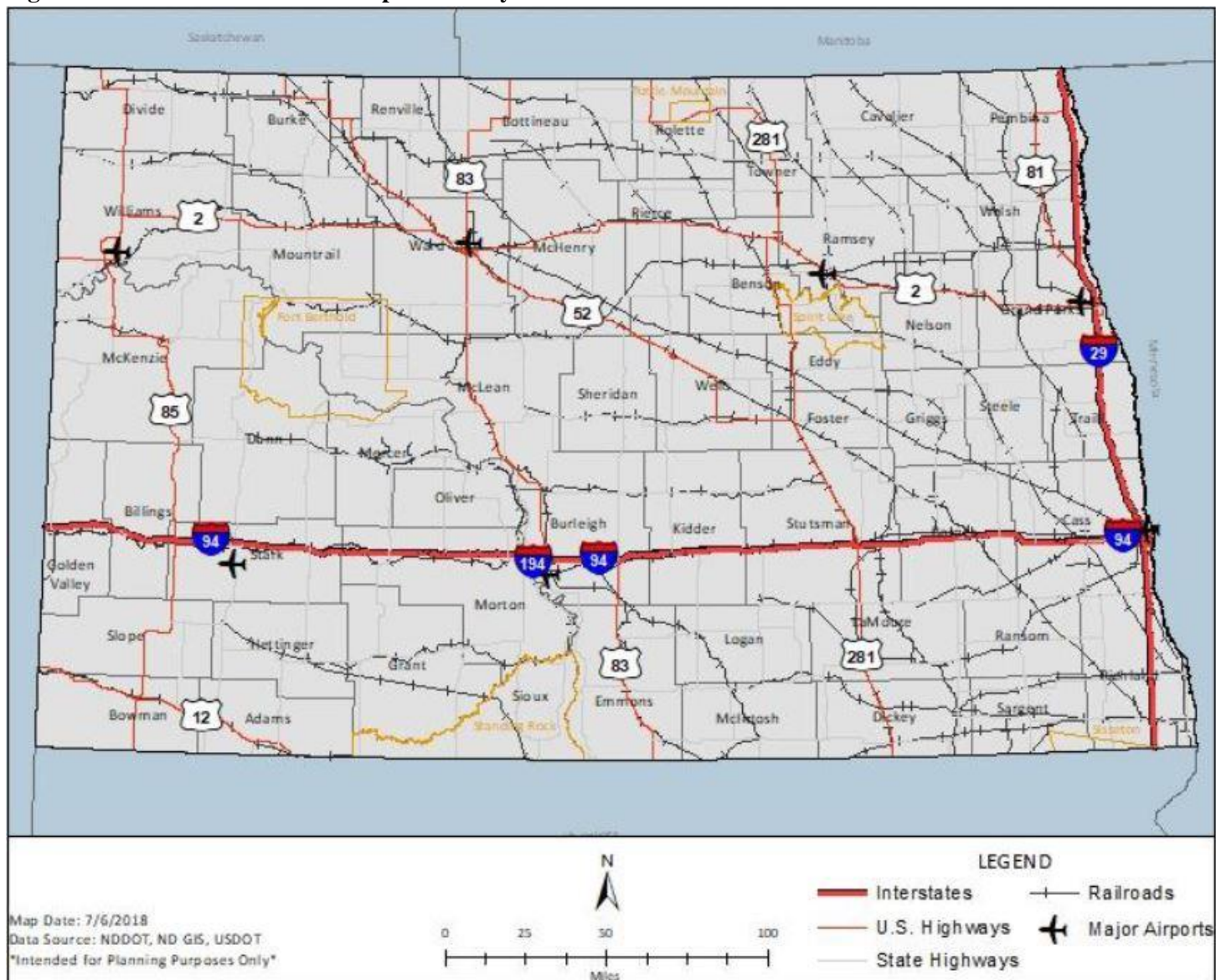
The extent/magnitude of a hazard or threat is expressed in the amount and/or number of damages or losses either actualized in a community or estimated based on known assets and levels of risk.

- According to the 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP), Barnes County has a moderate-high vulnerability to transportation incidents due to the county having an airport, interstate, and railroad infrastructure.
- According to 2016 N.D. Dept. of Transportation Crash Summary, approximately 10 percent of fatal crashes in the state occurred in urban locations and 90 percent of the fatal crashes occurred on rural roads. Barnes County was not among the top 10 counties with estimated injury and fatality costs for motor vehicle crashes in 2016.

Profile meeting participants indicated the extent/magnitude of a transportation incident for Barnes County would be critical, meaning an incident would result in noticeable damage to people, buildings, and property.

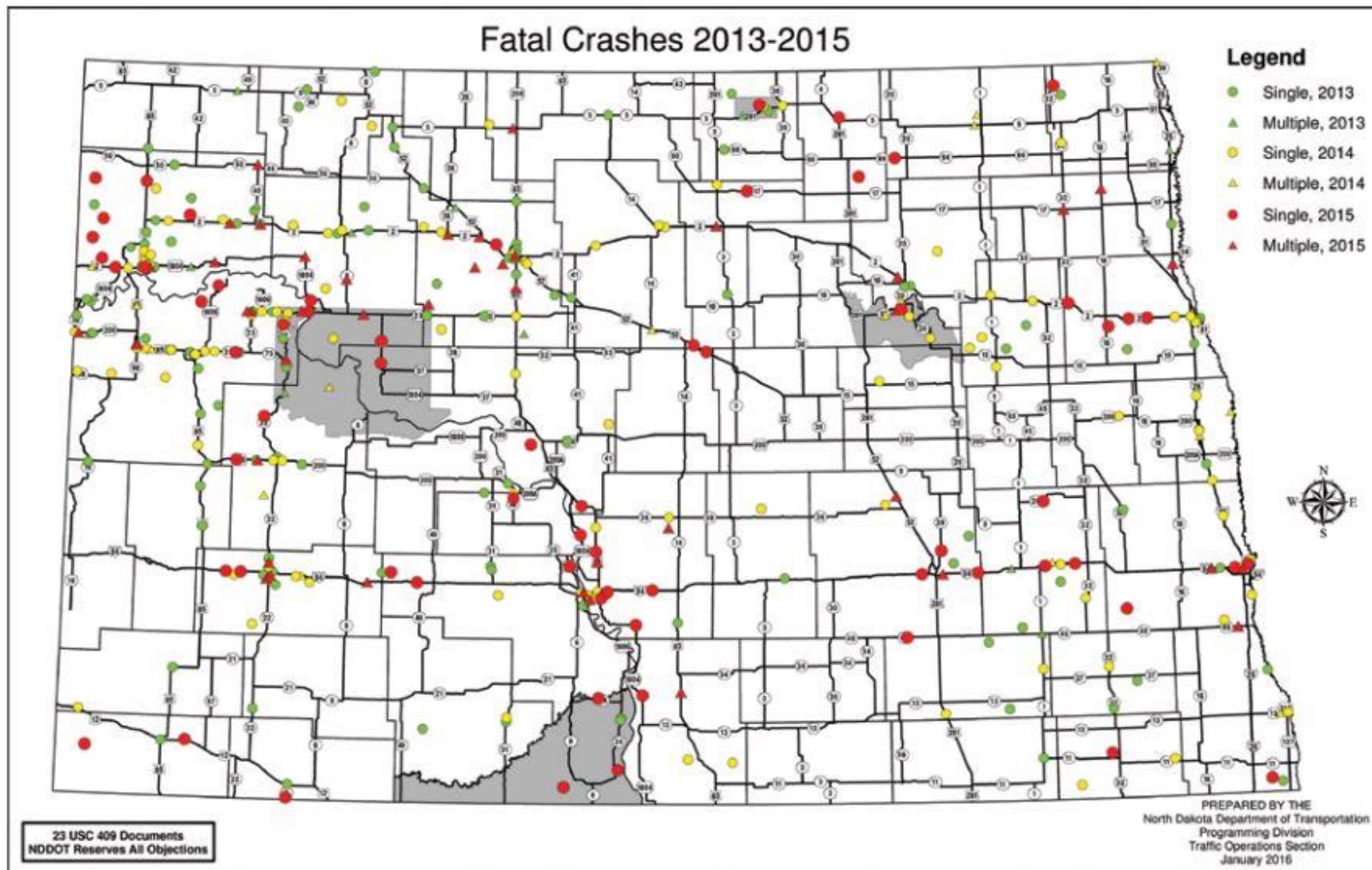
Figure 4.14.2 shows the location of fatal traffic crashes in Barnes County and greater North Dakota between 2013 and 2015.

Figure 4.14.1 – North Dakota Transportation System



Source(s): N.D. Dept. of Transportation

Figure 4.14.2– 2013 to 2015 Barnes County, N.D. Vehicle Accidents



Source(s): N.D. Dept. of Transportation

## Risk Assessment

Table 4.14.2 shows the risk assessment as determined by individual jurisdictions, the Steering Committee, and meeting participants at the profile meeting for transportation incident. The risk assessment methodology can be found in the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA). The total in Table 4.14.2 represents the sum of each jurisdiction's impact, frequency, likelihood and vulnerability to a hazard/threat less the jurisdiction's capabilities to respond to the hazard/threat.

**Table 4.14.2 – Barnes County Transportation Incident Risk Assessment Scored Chart Summary**

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Barnes County	4	4	4	4	2	<b>14</b>
City of Dazey	3	2	3	2	2	<b>8</b>
City of Fingal	4	3	4	4	1	<b>14</b>
City of Kathryn	1	2	2	2	1	<b>6</b>
City of Leal	4	2	3	4	2	<b>11</b>
City of Litchville	1	1	1	2	3	<b>2</b>
City of Nome	2	2	3	3	2	<b>8</b>
City of Oriska	4	2	3	3	2	<b>10</b>
City of Pillsbury	4	2	3	3	1	<b>11</b>
City of Rogers	3	2	4	4	1	<b>12</b>
City of Sanborn	4	2	4	4	1	<b>13</b>
City of Sibley	3	2	2	3	1	<b>9</b>
City of Valley City	4	4	4	4	1	<b>15</b>
City of Wimbledon	4	3	4	4	2	<b>13</b>

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 4.14.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of transportation incident in Barnes County. A list of impacts identified as commonplace for natural hazards and man-made threats regardless of the jurisdiction is shown in Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA).



**Table 4.14.3 – Barnes County Transportation Incident Risk Assessment**

<p><b>Impact</b></p>	<ul style="list-style-type: none"> <li>• <b>Blocked roads from severe weather and at-grade railroad crossing with roads and highways</b></li> <li>• Explosion</li> <li>• HAZMAT Release</li> <li>• Human Injury/Death / Mass Casualties/Fatalities</li> <li>• Increased Fire Potential</li> <li>• Loss of Transportation/Accessibility</li> </ul>	<ul style="list-style-type: none"> <li>• <b>900 injuries and 39 fatalities from vehicular crashes between 2005 and 2020</b></li> <li>• <b>Decrease in economic regional activity if impacting a major transportation artery for an extended period – railroads or Interstate 94</b></li> </ul>
<p><b>Frequency</b></p>	<ul style="list-style-type: none"> <li>• Annual occurrences of boating incidents, car crashes, truck-related incidents, etc.</li> <li>• <u>September 7, 2012.</u> An airplane was practicing for the airshow. The aircraft stalled and crashed in the airport airfield killing the pilot.</li> <li>• Plane crashes are occasional occurrences due to farmers using planes for crop dusting</li> <li>• <u>August 2016.</u> A crop plane was flying near the city of Sanborn. The plane’s engine failed and the pilot tried to set the plane down in an open field. The plane clipped the corn field and flipped over and crashed into a slough. The pilot was injured but survived.</li> </ul>	<ul style="list-style-type: none"> <li>• On average Barnes County experiences 204 property-damage only crashes, 42 injury crashes, 60 injuries, two fatal crashes, and three fatalities annually between 2005 and 2020.</li> </ul>
<p><b>Likelihood</b></p>	<p><u>More likely</u></p> <ul style="list-style-type: none"> <li>• Presence of state highways, Interstate 94, railroads, and the Barnes County Municipal Airport</li> <li>• High truck traffic with chemicals and fuel</li> <li>• High truck traffic from farm and agriculture related industry</li> <li>• High volumes of boating traffic on Lake Ashtabula and local bodies of water during the summer</li> <li>• <b>DAPL pipeline court ruling could cause rail traffic to increase</b></li> <li>• <b>Design of Interstate 94 through Valley City is not conducive to 75 mph traffic resulting in numerous injury crashes and fatalities – speeds should be reduced</b></li> <li>• <b>Presence of two BNSF lines and one CP Railway line</b></li> <li>• <b>Railroad infrastructure traverses the cities of Fingal, Leal, Rogers, Oriska, Pillsbury, Sanborn, Wimbleton</b></li> <li>• Plane crashes are occasional occurrences due to farmers using planes for crop dusting</li> </ul>	<p><u>Less likely</u></p> <ul style="list-style-type: none"> <li>• Railroad oil traffic decreased by 75 percent through the city of Valley City and Barnes County once the Dakota Access Pipeline opened</li> <li>• Intersection improvements on county highway system</li> <li>• No at-grade road and railroad crossings in Valley City – removal of BNSF spur through city limits</li> <li>• No passenger railroad service</li> </ul>

**Table 4.14.3 – Barnes County Transportation Incident Risk Assessment**

<b>Vulnerability</b>	<p><u>More vulnerable</u></p> <ul style="list-style-type: none"> <li>• Presence of state highways, Interstate 94, railroads, and the Barnes County Municipal Airport</li> <li>• High truck traffic with chemicals and fuel</li> <li>• High truck traffic from farm and agriculture related industry</li> <li>• High volumes of boating traffic on Lake Ashtabula and local bodies of water during the summer</li> <li>• <b>DAPL pipeline court ruling could cause rail traffic to increase</b></li> <li>• <b>Design of Interstate 94 through Valley City is not conducive to 75 mph traffic resulting in numerous injury crashes and fatalities – speeds should be reduced</b></li> <li>• <b>Presence of two BNSF lines and one CP Railway line</b></li> <li>• <b>Railroad infrastructure traverses the cities of Fingal, Leal, Rogers, Oriska, Pillsbury, Sanborn, Wimbledon</b></li> <li>• <b>Flooding of the Sheyenne River at Valley City can obstruct CP Railway infrastructure</b></li> <li>• <b>The flight pattern for landing of aircraft directs aircraft directly over the city of Valley City</b></li> <li>• <b>Lack of generator at Barnes County Municipal Airport – runway lights, Automated Weather Observation System (AWOS)</b></li> </ul>	<p><u>Less vulnerable</u></p> <ul style="list-style-type: none"> <li>• Railroad oil traffic decreased by 75 percent through the city of Valley City and Barnes County once the Dakota Access Pipeline opened</li> <li>• Presence of NDDOT shops for snow plowing and road clearing</li> <li>• Raising of road grades on county highways and Interstate 94 in Barnes County to prevent overland flooding and subsequent transportation incidents</li> <li>• No at-grade road and railroad crossings in Valley City – removal of BNSF spur through city limits</li> <li>• No passenger railroad service</li> <li>• Safe Routes to Schools identified in the Valley City Land Use Transportation Plan with projects being implemented continuously</li> <li>• <b>BNSF raised rail grades and mitigated overland flooding issues</b></li> <li>• <b>CP Railway installed crossing arms near Barnes County North</b></li> </ul>
	<b>Capability</b>	See Chapter 7 for a list of capabilities to address transportation incident.

### **Vulnerabilities to Publicly Owned Buildings and Property**

Publicly-owned buildings and property should not be affected by transportation incidents except in an instance where a train derails or a vehicle crashes into a building. However, any truck incident involving hazardous materials, train derailments, or aircraft incidents occurring in proximity of a publicly owned building or property could result in property damage, mass casualties/fatalities, or large-scale evacuations. Should an incident of this nature occur, damage could exceed hundreds of thousands or millions of dollars, depending on the structure impacted. Buildings supporting key functions to daily county and incorporated jurisdiction operations most vulnerable include but are not limited to Barnes County Correctional Center, Barnes County Courthouse, Barnes County Law Enforcement Center, Valley City City Hall, Valley City Police Department, public schools and buildings supporting emergency services such as fire stations or ambulance halls. A transportation incident can result in power outages if occurring near and impacting power infrastructure. Power losses could result in the prolonged loss of service of publicly owned buildings and property.

A summary of city and county-owned buildings and property in Barnes County is provided in Chapter 3, Profile and Inventory.

### **Vulnerabilities of Critical Facilities and Infrastructure**

Critical facilities such as the Barnes County Ambulance Hall and CHI Mercy Health Valley City, and infrastructure such as water/wastewater treatment facilities and power grid infrastructure should not be affected by transportation incidents, except in rare occurrences.

Railroads or roads would be affected as this is where transportation incidents are likely to occur. Vulnerabilities could include a closure of a major transportation artery such as the interstate or railroad due to an incident, which can block access for emergency services, disrupt economic activity, and add strain onto other arteries in the overall transportation system. A transportation incident can result in power outages if occurring near and impacting power infrastructure. Power losses could result in the loss of critical facilities such as lift stations or water treatment plants, resulting in property damages from sewer backups.

### **Vulnerabilities to New and Future Development**

New and future development could result in increased traffic related to commercial, industrial or residential development. Any additional traffic will increase the probability of minor, moderate, or major transportation incidents. The location of new and future development will determine the probability of future transportation incidents and should be conducive to nearby transportation infrastructure – i.e., industrial development near major highways or railroads, or commercial development near existing commercial corridors or transportation infrastructure with high visibility. Locations of new and future residential development conducive to transportation infrastructure is dependent on the local zoning code and proposed density of each respective development.

### **Data Limitations**

Recorded crash data and statistics were unavailable for county and township roads.

### Other Key Documents

This plan incorporates data from the following documents and information from this plan will be incorporated in the update of the following documents.

- 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)
- 2018 North Dakota Highway Safety Plan
- 2020 N.D. Dept. of Transportation Urban High Crash Locations Report
- Barnes County Comprehensive Plan
- Barnes County Local Emergency Operations Plan
- Barnes County Threat and Hazard Identification and Risk Assessment (THIRA)
- Barnes County Municipal Airport (BAC) Airport Security Plan (ASP)
- Barnes County Municipal Airport Capital Improvement Plan
- Barnes County Municipal Airport Emergency Plan (AEP)
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan, Transportation Incident Annex
- North Dakota State Disaster Recovery Plan
- North Dakota Statewide Transportation Improvement Plan (STIP)
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)
- TransAction III, North Dakota's Statewide Strategic Transportation Plan
- Valley City Land Use and Transportation Plan

### 5. Future Conditions

The Federal Emergency Management Agency (FEMA) is now requiring inclusion of information on the long-term effects of climate change on identified hazards in state hazard mitigation plans. The 2021 Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan is incorporating this requirement at the local level to remain in line with state leadership.

#### National Climate Assessment (NCA)

Developed by the U.S. Global Change Research Program (USGCRP) is a synthesis of climate knowledge, impacts, and trends across regions of the United States and various sectors to inform decision-making with respect to a changing climate. This synthesis also identifies resilience-building activities that can be incorporated at the local level through mitigation planning.

#### Changes in North Dakota Weather and Climate

According to the NCA information included in the 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP), the state of North Dakota will experience the following changes in climate patterns across the state:

- More days with precipitation over a half-inch
- Longer dry spells (consecutive days without precipitation)
- Summer days with maximum temperatures over 95 degrees Fahrenheit will increase as well as summer nights with minimum temperatures over 65 degrees Fahrenheit
- Increase in winter and spring precipitation
- Warming winters

North Dakota's annual temperature increase over the previous 130 years is the fastest in the contiguous United States and is driven primarily by warming winters.

#### Anticipated Future Impacts

According to the NCA information included in the 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP), the following impacts for the state of North Dakota will influence the long-term vulnerability to natural hazards and will be realized if predictions on future conditions come to fruition:

- Increases in winter and spring precipitation may heighten chances of spring flooding leading to wetter soils to start growing season
- Longer growing seasons but continued risk for late spring and early fall freezing
- More days over 95 degrees Fahrenheit during the summer adding stress to livestock and increasing evaporation with subsequent drying of soils and degradation of plant life
- Increase in demand for energy during the summer (air conditioning)
- Decrease in demand for energy during the winter (heating)
- Potential increase in invasive species including animals, fungi, insects, plants, and viruses
- Decrease in culturally significant animal and plant life in tribal communities

### Anticipated Future Impacts of Natural Hazards

A changing climate will affect more than just temperatures and precipitation levels. An increase in frequency and severity of extreme heat events and severe summer weather which will adversely affect public health, water resources, and the production of agriculture (crops and livestock). A changing climate will simultaneously increase the frequency and severity of extreme cold and severe winter weather which will also adversely impact public health and water resources, in addition to essential services. The average length of the growing seasons will increase by 12 days per century in North Dakota.

According to the 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP), the expected impact of climate change on the 14 natural hazards and man-made threats detailed in this plan are outlined below.

- **Civil Disturbance.** Increased risk to civil disturbances targeted toward the oil and gas industry in North Dakota from growing public concern over impacts from climate change.
- **Criminal, Terrorist, or Nation-State Attack.** No expected impact.
- **Cyberattack.** No expected impact.
- **Dam Failure.** The expected increase in intensity and severity of precipitation events may put more dams at risk to scenarios that exceed original design criteria of each respective dam. Aging dams are most at risk to this expected impact.
- **Drought.** According to the 2014 NCA, the “Northern Plains, including North Dakota, will remain vulnerable to periodic drought because of the projected increase in precipitation is expected to occur in the cooler months while increase temperatures will result in addition evapotranspiration during the summer months. The warming trend observed in North Dakota is expected to continue, which may contribute to an increase in the frequency and intensity of drought in the state.” Drought impacts on vulnerable water users such as the agriculture industry and municipal systems will be exacerbated. Overall, droughts are expected to be more frequency and intense, which will result in increased losses.
- **Fire (Urban Structure/Collapse).** No expected impact. However, water supplies use for fire suppression may be compromised and occurrences may increase as North Dakota expects an increase in wildland fires.
- **Fire (Wildland).** The top 10 years with the largest area burned have all occurred since 2000 in the state of North Dakota. The frequency of wildland fires will increase as will the risk due to increasing rural residential development in the Wildland-Urban Interface. In addition, as of October 4, 2017, 96% of fire departments in North Dakota are staffed with volunteers. As the frequency and intensity of wildfires increase, these volunteer firefighters may become stressed for resources and time to respond to these fires. Volunteer fire departments are losing personnel strength when firefighters retire and, in many cases, move to larger towns where medical care is more readily available.

- **Flood.** According to the 2014 NCA, winter and spring precipitation is projected to increase in the northern Great Plains region relative to a 1971 to 2000 average. This increase in precipitation may exacerbate flooding in North Dakota due to the increased amount, but also due to precipitation falling when the ground is frozen and unable to absorb moisture. The number of days with heavy precipitation is also likely to increase by mid-century. Overall, climate change is projected to increase precipitation in North Dakota.
- **Geologic Hazard.** Increased development pressure and the impacts of climate change may increase risk to state assets if they are constructed on areas prone to geologic hazards. Expansive soils and landslides are likely to increase due to the projected increase in precipitation.
- **Hazardous Material Release.** Although largely human-caused, climate change indirectly impacts this hazard. The frequency of hazardous material releases may coincide with increased occurrences of natural hazards such as wildland fires and floods due to the vulnerability of fixed facilities that store hazardous materials or waste.
- **Infectious Disease.** The state of North Dakota should expect an increased risk to infectious disease and pest infestations in the future. The two largest factors influencing future risk relate to how and where population growth (or withdrawal) and development occurs.
- **Severe Summer Weather.** Uncertainty regarding changes in severe storms exists as the localized nature of the hazard is difficult to capture in climate models. However, it is expected that downpours will be exacerbated by climate change leading to an increase in flash flooding.
- **Severe Winter Weather.** Winter storms have increased in frequency and intensity since the 1950s. The tracks of storms has shifted northward over the United States. Winter and spring precipitation is expected to increase in North Dakota due to climate change. Liquid winter precipitation (indicated by ice storms) are more frequent. Increasing occurrences of winter storms that bring blizzard conditions, heavy snow, and ice will impact people and the local and state economy and will have an impact on critical facilities and infrastructure.
- **Space Weather.** No expected impact.
- **Transportation Incident.** Natural hazards can and do influence the probability and extent/magnitude of transportation incidents. Therefore, the changing nature of severe summer weather and severe winter weather from climate change will have an indirect impact on transportation incidents, primarily through hazardous road conditions. These conditions may put strain on existing emergency medical services and require an increase in sheltering capacities.

## 6. Barnes County, North Dakota Mitigation Strategy

### Mitigation Purpose, Goals, and Projects

The Barnes County Multi-Jurisdictional Multi-Hazard Mitigation Plan includes a mitigation strategy consisting of seven goals and specific mitigation projects for each incorporated jurisdiction based on the risk assessment developed at Steering Committee and jurisdictional meetings.

The following are the seven goals that were reviewed, updated, and approved:

**Goal 1: Improve and expand education and outreach programs to improve public awareness of hazards and threats.**

**Goal 2: Improve and expand administrative and technical capability to mitigate hazards and threats.**

**Goal 3: Improve and expand financial capability to mitigate hazards and threats.**

**Goal 4: Improve and expand planning and regulatory capability to mitigate hazards and threats.**

**Goal 5: Reduce and/or eliminate impacts of hazards and threats.**

**Goal 6: Improve resiliency of critical facilities and infrastructure.**

**Goal 7: Provide places of refuge and early warnings for the public and vulnerable populations to take protective action during hazard events.**

The mitigation strategy for Barnes County consists of 37 mitigation projects.

All-natural hazards and man-made threats were considered, and mitigation projects were formulated based on the potential or previous effects of hazards, the high probability of hazard or threat occurrences, the vulnerability of jurisdictions to hazards, and hazards each project can mitigate. The problem statement for Barnes County, which assisted in formulating specific mitigation actions to reduce the impacts of hazards, is shown before the mitigation actions.

### Mitigation Project Development

The Steering Committee identified the following characteristics of each mitigation project and is included in each project profile:

- Description/benefit
- Hazard(s) addressed
- Affected jurisdiction
- Project status
- Priority
- Responsible agency
- Partners
- Timeframe for completion
- Cost
- Funding sources



**Scoring and Prioritization**

The Steering Committee also scored and ranked projects based on a FEMA process – STAPLEE – that allows a community to understand the support for a project; the potential costs in dollars, time and expertise; environmental impact; and the benefit of the project. The specific words in the acronym STAPLEE are social, technical, administrative, political, legal, economic, and environmental. Each project was scored using a one to five (1 to 5) scoring.

- A score of one (1) indicated a project is ineffective, not feasible and/or too costly;
- A score of three (3) was neutral, and
- A score of five (5) indicated the project was highly effective, feasible and/or a higher benefit compared to cost.

Each mitigation project included in the plan is valuable as it addresses needs specific to Barnes County and its jurisdictions. Due to a variety of constraints, not all projects can be implemented simultaneously and must be prioritized with the most critical projects being emphasized for implementation in the near term. However, the prioritization of each project can change over time to respond to changes in a community and to take advantage of resources that become available.

The Steering Committee prioritized each mitigation project on a very high, high, medium, and low designation based on scoring of the documentation, past experiences and professional judgement, and what projects are technically feasible to accomplish based on the capabilities of all jurisdictions. Table 6.1 summarizes the projects by priority by jurisdiction.

**Table 6.1 – Prioritization of Mitigation Projects by Jurisdiction**

<b>Jurisdiction</b>	<b>Project Number by Prioritization</b>			
	<b>Low</b>	<b>Medium</b>	<b>High</b>	<b>Very High</b>
Barnes County		AT: 2, 6 EO: 6, 9 PR: 8	AT: 1, 2, 3, 5, 7, 9, 10 EO: 1, 3, 4, 5, 7, 8, 10 PR: 2, 4, 5, 6, 7, 8, 9, 11 I: 3, 4, 5	AT: 4, 8 EO: 2 F: 1 PR: 1, 3, 10 I: 1, 2
City of Dazey		5	3, 4	1, 2
City of Fingal		3	4	1, 2
City of Kathryn			3, 4	1, 2
City of Leal			1	2
City of Litchville		3	2, 4	1
City of Nome			1, 2, 3	
City of Oriska			1, 2, 3	
City of Pillsbury			1	
City of Rogers			1, 2, 3	
City of Sanborn			1, 2	
City of Sibley			1, 2	3
City of Valley City		AT-7, AT-10, AT-11,	AT-2, AT-3, AT-5, AT-6, AT-8, AT-12, EO-1, EO-2, PR-1, PR-2, I-1, I-2, I-3, I-4,	AT-1, AT-4, AT-9, F-1, PR-3, I-5, I-6,
City of Wimbledon			1, 2	3

Projects with affected jurisdictions identified as ‘Barnes County and incorporated jurisdictions’ are shown in the table under Barnes County as these projects are assumed to be a county effort. Mitigation projects with jurisdictions specifically identified are represented in the respective jurisdiction profile located in Chapter 8, Jurisdictions.

**Mitigation Project Titles**

The title of each mitigation project corresponds with the category of mitigation capability it addresses: Administrative & Technical (AT), Education & Outreach (EO), Financial (F), and Planning and Regulatory (PR). A fifth category, Infrastructure (I), was created to identify projects involving construction activities and physical building efforts.

**Acronyms and Definitions**

The acronyms and definitions used in the responsible agency and partners section of each mitigation projects profile are described in Table 6.2.

**Table 6.2 – Acronyms and Definitions of Responsible Agencies and Partners for Mitigation Projects**

Acronym/Definition	Entity
ARS	U.S. Dept. of Agriculture, Agriculture Research Station
BOR	Bureau of Reclamation
CDBG	Community Development Block Grant
City Council(s)	Cities of Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, Wimbledon
County Commission	Barnes County Commission
DWR	N.D. Dept. of Water Resources
Emergency Management	Barnes County Office of Emergency Management
Emergency Services	Ambulance, fire, law enforcement, specialty units (local, regional, state)
Engineering	Municipal Engineering Department or private engineering firms
EPA	Environmental Protection Agency
Extension	NDSU/Barnes County Extension Service
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FRA	U.S. Dept. of Transportation, Federal Railroad Administration
FSA	USDA - Farm Service Agency
Highway Department	Barnes County Highway Department
Historical Society	State Historical Society of North Dakota
HUD	U.S. Dept. of Housing and Urban Development
IT	Barnes County Information Technology Department, University of Valley City Technology Department, respective IT directors/staff for public schools and critical facilities and infrastructure
Media	<p><u>Newspaper:</u> Enderlin Independent, Litchville Bulletin, Valley City Times Record, Wimbledon Newsletter</p> <p><u>Social Media:</u> Barnes County, Barnes County Ambulance Area Ambulance, City-County Health District, Valley City Fire Department/Valley City Rural Fire Protection District, NDSU Extension/Barnes County, Barnes County Emergency Management, Barnes County Sheriff’s Office</p>

**Table 6.2 – Acronyms and Definitions of Responsible Agencies and Partners for Mitigation Projects  
– Continued**

<b>Acronym/Definition</b>	<b>Entity</b>
Media - Continued	<u>Websites:</u> Barnes County, City of Valley City, Valley City Public Schools, Barnes County North, Valley City State University  <u>Radio Stations:</u> KSJB, KDQJ, KDDR, KOVC
Medical Service Providers	<u>Hospitals:</u> CHI-Mercy Hospital <u>Medical Clinics:</u> Essentia Health-Valley City, Sanford Health-Valley City
NCDC	National Climatic Data Center
NDACo	N.D. Association of Counties
NDDA	N.D. Dept. of Agriculture
NDDC	N.D. Dept. of Commerce
NDDEQ	N.D. Dept. of Environmental Quality
NDDES	N.D. Dept. of Emergency Services
NDDH	N.D. Dept. of Health
NDDOT	N.D. Dept. of Transportation
NDGF	N.D. Game & Fish
NDGS	N.D. Geological Survey
NDIT/NRG	N.D. Information Technology/NRG Technology Services
NDLC	N.D. League of Cities
NDTOA	N.D. Townships Officers Association
NOAA	National Oceanic and Atmospheric Administration
NRCS	USDA Natural Resources Conservation Service
NWS	National Weather Service
Planning & Zoning	Planning and Zoning Board, or County Commission & City Council(s)
Public Health	City-County Health District (CCHD)
PSC	Public Service Commission
<b>Public Utilities</b>	<u>Cable:</u> Cable Service, Inc. (CSI), Dakota Central Telecommunications (Daktel), Midco, Satellite/DirecTV/Dish Network  <u>Electricity:</u> Missouri River Energy Services (MRES), Otter Tail Power Company (OTPCO), Wester Area Power Administration (WAPA)  <u>Internet:</u> Cable Service, Inc. (CSI), Dakota Central Telecommunications (Daktel), Midco, Satellite/DirecTV/Dish Network  <u>Natural Gas:</u> Montana-Dakota Utilities  <u>Phone (cellular):</u> AT&T, Smart Talk/Trac Phones, Verizon  <u>Phone (landlines):</u> Cable Service, Inc. (CSI), Dakota Central Telecommunications (Daktel), Midco  <u>Waste (solid and water):</u> Central Dakota Sanitation, municipal services, Strom Sanitation, Waste Management

**Table 6.2 – Acronyms and Definitions of Responsible Agencies and Partners for Mitigation Projects  
– Continued**

<b>Acronym/Definition</b>	<b>Entity</b>
Public Utilities - Continued	Water: Barnes Rural Water District, Cass Rural Water Users District, Dakota Rural Water District, City/municipal well, individual wells, Ramsey Rural Water District, reservoir,
Public Schools	Barnes County North Public School, Litchville-Marion Elementary School, Maple Valley School (neighboring Cass County), Valley City Public Schools
Public Works	Barnes County Highway Department, city public works, county and city park boards/districts
Red Cross	American Red Cross
Regional Council	South Central Dakota Regional Development Council
RD	U.S. Dept. of Agriculture – Rural Development
Social Services	Buffalo Bridges Human Services Center
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
USACE	U.S. Army Corps. of Engineers
VOAD (Voluntary Organizations Active in Disaster)	Adventist Community Services, American Red Cross, Catholic Charities, Church of Jesus Christ of Latter Day Saints, Citizen Corps, Civil Air Patrol, FirstLink, Legal Services of North Dakota, Lutheran Social Services Disaster Response, Mental Health American of ND, N.D. Emergency Management Association (NDEMA), MECHAMA – Jewish Response to Disaster, Presbytery of Northern Plains, Psychological Association, Radio Amateurs, RSVP+, The Salvation Army, Team Rubicon, Inc., United Church of Christ – Northern Plains Conference, United Methodist Disaster Response – Dakotas Conference, World Renew
Water Resource District	Barnes County Water Resource District

### **Problem Statements**

Problem statements provide a concise description of the vulnerabilities of the jurisdiction to threats and hazards that should be addressed through mitigation actions. The specific mitigation actions to reduce the impacts of hazards are identified for each jurisdiction and are found after the problem statement. The problem statements and jurisdiction-specific mitigation projects can be found in Chapter 8, Jurisdictions.

### **Barnes County**

Barnes County can be impacted by civil disturbance; criminal, terrorist or nation-state attack; cyberattack; dam failure, drought, fire (urban/structure collapse, and wildland/rural), flood (overland and riverine), geologic hazard, hazardous material release, infectious disease, severe summer weather, severe winter weather, space weather, and transportation incident. Flooding is a major issue due to the presence of a high-water table, closed basins, and the James River traversing through the county. The drainage system in the county needs upgrading to reduce/eliminate occurrences of overland flooding and damage to infrastructure. Structures continue to remain in flood-prone and geologic-hazard areas. Critical facilities and infrastructure need engineering studies to identify the proper scope of work for retrofitting and upgrading to withstand natural hazards and man-made threats. Isolation of incorporated communities from blocked roads or prolonged power outages can result from severe weather. Adoption and enforcement of building codes and the lack of storm shelters remain an issue in smaller communities. Critical facilities and infrastructure lack generators for permanent backup power. Portable generators are also needed. The risk to cyberattack is increasing due to the continued digitization of society. The county has administrative and technical, education and outreach, financial, and planning and regulatory capabilities to accomplish mitigation. However, the county relies on outside sources for construction of permanent flood control measures and other large-scale mitigation projects.

Permanent flood protection, flood control measures, improved drainage, upgrading of critical facilities and infrastructure, upgrading of emergency sirens, improved access for emergency services, and construction of additional storms shelters, and continuous improvement to administrative and technical, education and outreach, financial and planning and regulatory capabilities are a priority for the county.

**Barnes County Project AT-1: Expand administrative and technical mitigation capabilities.**

Description/Benefit		Expand administrative and technical mitigation capabilities to improve county readiness and preparedness.  <u>Administration:</u> Convert verbal mutual aid agreements to written mutual aid agreements, and continuously update where necessary. Provide continuous planning and zoning education to engineer/inspection departments.  <u>Staff:</u> Continue education for Barnes County Floodplain Administrator and staff to inspect/enforce building codes. Education should take place on the N.D. Risk Assessment MapService (NDRAM) software.  <u>Technical</u> <ul style="list-style-type: none"> <li>• Install solar-powered electronic fire index sign at strategic points on the county road system or county parks (Valley City, County Road 21 North of the Sheyenne River, South on the Kathryn Road/118<sup>th</sup> Ave SE)</li> <li>• Complete HAZUS Analysis for Barnes County and incorporated jurisdictions</li> <li>• Install and/or expand directional signage for emergency services and for truck/hazmat routes</li> <li>• Install faraday cages/shields at technological/digital infrastructure systems at critical facilities and infrastructure</li> <li>• Install enhanced cybersecurity countermeasures (i.e., PA Traps/malware, multi-factor authentication, etc.) - specific attention should be paid to the recommendations made in <b>N.D. Cybersecurity Maturity Assessment</b></li> </ul>					
Hazard/Threat Addressed		All (Space Weather)					
Affected Jurisdictions		Barnes County and incorporated jurisdictions					
Project Status		New/Ongoing and Continue					
Priority		High					
Responsible Agency		City Council(s), County Commission, Emergency Services, NDIT, Public Schools, Public Works, Public Utilities					
Partners		Emergency Management, Extension, Planning & Zoning					
Completion Timeframe		Ongoing	Cost	Project-specific. \$30,000 for fire index signs			
Funding Source		Local, state, federal grants. FEMA, Public Utilities, Regional Council, RD.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	3	2	2	4	2	5	23
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Building Permits		Capability Assessment, Hazard History, Risk Assessment			Solicit project scope of work. Pursue grant funding or use local funds.		

**Barnes County Project AT-2: Assure continuous and effective operation of Barnes County Alerting System (Everbridge) and promote residents to sign up. Upgrade and expand early warning system(s) where necessary.**

Description/Benefit		<p>Keep public informed on current general notifications, emergency notifications, and severe weather. Outdoor early warning system/sirens do not provide coverage to an adequate geographic expanse of the county. Upgrade existing manually-activated sirens to dispatch-activated sirens. There are no existing outdoor early warning sirens for the county outside incorporated cities or recreation areas near Baldhill Dam and Lake Ashtabula.</p> <p>An alerting plan should be developed for incorporated jurisdictions during flash flooding and heavy precipitation events.</p> <p><b><u>Upgraded Outdoor Emergency Sirens:</u></b> City of Dazey, City of Kathryn, City of Leal, City of Litchville, City of Nome, City of Oriska, City of Sibley, City of Valley City (where necessary)</p>					
Hazard/Threat Addressed		Flood, Hazardous Material Release, Severe Summer Weather, Fire (Wildland), All					
Affected Jurisdiction(s)		Barnes County and incorporated jurisdictions					
Project Status		New/Ongoing and Continue					
Priority		Medium/High					
Responsible Agency		Barnes County Dispatch, City Council(s), County Commission, Emergency Management, Emergency Services					
Partners		FEMA, NDDDES, Public Safety, Public Works					
Completion Timeframe		Ongoing	Cost	Siren: Up to \$25,000 per siren Mass Notification: \$7,000 annually			
Funding Source		9-1-1 funding (portion). State Homeland Security Grant Program. FEMA. Tier II/HazChem.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
4	5	5	4	4	4	5	32
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Develop specifications. Receive EHP approval. Pursue grant funding. Approval by county commission/city councils.		

**Barnes County Project AT-3: Upgrade existing or construct/purchase new equipment and/or infrastructure for emergency services and incorporated jurisdictions.**

Description/Benefit		Purchase and/or install upgraded equipment for ambulance, fire and law enforcement. Improve administrative and technical capabilities of emergency services to mitigate the impact of hazards. A focus of emergency services should be to upgrade equipment to be GIS/GPS capable. A list of jurisdictions and respective emergency services with listed needs is shown on the next page.					
Hazard/Threat Addressed		All hazards					
Affected Jurisdiction(s)		Barnes County and incorporated jurisdictions					
Project Status		New					
Priority		High					
Responsible Agency		Emergency Management, Emergency Services, Fire Districts, Ambulance Districts					
Partners		City Council(s), County Commission					
Completion Timeframe		1 to 3 years for radios; 5+ years for buildings	Cost	Project-specific			
Funding Source		Local mill levies. State and federal grants. CDBG, Emergency Services, FEMA, HUD, Public Utilities, RD, USFS. Rural Community Development Loans					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	3	5	2	4	28
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Review by emergency services, cities, or county. Budget or apply for grant funding. Approval by board, county commission, or city council(s), and taxing districts.		



### **Barnes County Project AT-3: Upgrade existing or purchase new equipment and/or infrastructure for emergency services and incorporated jurisdictions.**

- **Barnes County Ambulance:** 800-megahertz trunk radio for SIRN 2020, relocation into a new headquarters, four-wheel drive ambulance
- **Barnes County:** Upgraded communication system for use during flood and emergency meetings with the public – including web design, white board, camera, and a sound system with microphones.
- **Barnes County Sheriff's Office:** 800-megahertz trunk radio for SIRN 2020
- **CHI-Mercy Hospital:** 800-megahertz trunk radio for SIRN 2020
- **Rural fire departments:** 800-megahertz trunk radio for SIRN 2020, SCBAs, Turnout gear, new fire halls where needed (Litchville)
- **Nome, City of:** Snow removal equipment
- **Valley City, City of:** 800-megahertz trunk radio for SIRN 2020, traffic signals – interior electrical components only, Upgraded communication system for use during flood and emergency meetings with the public – including web design, white board, camera, and a sound system with microphones.
- **Valley City Fire Dept.:** 800-megahertz trunk radio for SIRN 2020, pumper truck, upgrade underwater remote-operated vehicle
- **Valley City Police Department:** 800-megahertz trunk radio for SIRN 2020, new public safety building in southwest area of the city
- **Valley City Rural Fire Dept.:** 800-megahertz trunk radio for SIRN 2020, new public safety building in southwest area of the city, high-angle rope rescue

**Barnes County Project AT-4: Install new permanent generators and/or upgrade existing permanent or portable generators at critical facilities and infrastructure.**

Description/Benefit	<p>Upgrade existing generators or install new generators to establish permanent source of backup power to maintain continued operation of the following critical facilities and infrastructure. <b>Additional redundancies in power grid systems are a high priority.</b></p> <p><b><u>New (permanent):</u></b> Barnes County Ambulance, Barnes County Municipal Airport, Graichen Gym – VCSU, Methodist Church, Valley City Auditorium, Valley City High School, Valley City Rec Center, We Osmon Fieldhouse - VCSU</p> <p><b><u>Upgrade (permanent):</u></b> Barnes County Courthouse, Barnes County Highway Department, City-County Health District</p> <p><b><u>New portable:</u></b> Barnes County Highway Department county shops, Barnes County Sheriff’s Office</p>						
Hazard/Threat Addressed	All hazards						
Affected Jurisdiction(s)	Barnes County and incorporated jurisdictions						
Project Status	Ongoing and Continue						
Priority	Very High						
Responsible Agency	County Commission, City Council(s), Emergency Management, Emergency Services, Public Schools, taxing districts						
Partners	Medical Services Providers, Public Utilities, Public Works						
Completion Timeframe	Ongoing and Continue	Cost	Project-specific				
Funding Source	Public Utilities and RD. FEMA Building Resilient Infrastructure & Communities (BRIC). Homeland Security Grant Program.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
4	5	5	4	5	4	4	31
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Procure scope of work for project. Receive EHP Approval. Apply for grant funding.		

**Barnes County Project AT-5: Establish permanent maintenance system for storm water systems/drainage ditches to reduce or eliminate occurrences of overland flooding.**

Description/Benefit		Create drainage ditch/storm water maintenance system to control flow of runoff to eliminate blocked roads, maintain access for city/county residents and emergency services, and maintain continuous operation of public infrastructure. Establishment of a system will assist in reimbursement from state and federal sources for expenses incurred during emergency events.					
Hazard/Threat Addressed		Drought, Fire, Flood (Overland), Infectious Disease, Severe Summer Weather, Severe Winter Weather					
Affected Jurisdiction(s)		Barnes County and incorporated jurisdictions					
Project Status		New					
Priority		High					
Responsible Agency		City Council(s), County Commission, Highway Department, Public Works					
Partners		Emergency Management, Emergency Services, NRCS, DWR, Water Resource District					
Completion Timeframe		End of 2022	Cost	Staff-time			
Funding Source		Local budgets.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	3	5	4	32
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Development of system by city/county public works. Approval and adoption by city councils, county commission, water resource district.		

**Barnes County AT-6: Install Faraday Cages/Shields for digital/technological infrastructure systems at critical facilities and infrastructure.**

Description/Benefit	<p>A Faraday Cage or Shield is an enclosure used to block electromagnetic fields from technological/digital infrastructure systems. Due to increasing dependency of technological/digital systems in private and public sectors, a space weather event of significance could destroy all local government information resulting in a complete shutdown of government operations.</p> <p>The potential loss of technological/digital infrastructure could occur at, but is not limited to, the following critical facilities and infrastructure: Barnes County Ambulance, Barnes County Courthouse, Barnes County Law Enforcement Center/Correctional Center, Barnes County Sheriff’s Office, City-County Health District, CHI-Mercy Hospital, Valley City State University, communication towers, generators, phone systems, correctional centers, public and private schools, substations, electrical grids, medical clinics, and other specialty facilities such as nursing homes and senior housing facilities.</p>						
Hazard/Threat Addressed	Space Weather						
Affected Jurisdiction(s)	Barnes County and incorporated jurisdictions, where applicable						
Project Status	New						
Priority	Medium						
Responsible Agency	City Council(s), County Commission, Emergency Management, Emergency Services, respective IT departments						
Partners	Engineering, NDIT						
Completion Timeframe	Ongoing	Cost	Project-specific				
Funding Source	Local budgets. State and federal grants.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	3	5	33
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Development of specifications and receive approval from city council/county commission/agency/respective board. Apply for grant funding or fund independently.		

**Barnes County AT-7: Establish Penetrative Testing Schedule with outside vendors and conduct on an annual basis.**

Description/Benefit		<p>Penetration testing, also called pen testing or ethical hacking, is the practice of testing a computer system, network, or web application to find security vulnerabilities that a cyber-attacker could exploit. Penetration testing can be automated with software applications or performed manually. Barnes County provides IT services to the city of Valley City and would be included in the county’s schedule.</p> <p><b>Barnes County:</b> Performs testing in-house but needs to establish a relationship with an outside vendor to conduct on an annual basis.</p> <p><b>Valley City State University:</b> Dependent on the N.D. University System.</p> <p>Barnes County and public and private schools are encouraged to establish an annual joint penetrative testing schedule to test for security vulnerabilities and make strategic investments, where necessary.</p>					
Hazard/Threat Addressed		Cyberattack (All)					
Affected Jurisdiction(s)		Barnes County and incorporated jurisdictions, where applicable					
Project Status		New					
Priority		High					
Responsible Agency		Barnes County IT, Valley City State University IT (N.D. University System), public schools					
Partners		NDIT/N.D. Legislature, City Council(s), County Commission, Emergency Management, Emergency Services					
Completion Timeframe		Ongoing	Cost	Project-specific			
Funding Source		Local budgets. State and federal grants. N.D. Legislature.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	4	5	34
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County Capital Improvement Plan Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA Valley City Capital Improvement Plan VCSU Capital Improvement Plan		Capability Assessment, Hazard History, Risk Assessment			Contact outside vendor and receive cost estimate. Identify specific time each year to perform the testing. Present findings to city council/county commission/agency/respective board for approval. Apply for grant funding or fund independently.		

**Barnes County Project AT-8: Install homeland security measures at critical facilities and infrastructure.**

Description/Benefit		<p>The Barnes County Courthouse, Barnes County Correctional Center, Barnes County Law Enforcement Center, and Barnes County Highway Department are critical facilities vulnerable to adversarial threats. Barnes County shops and other miscellaneous structures are also vulnerable. – borrow list from faraday cage project and add here.</p> <p>Installation of (but not limited to) access control measures, cybersecurity enhancements, door alarms, door locks, enhanced lighting, security fencing, motion-detecting systems, and security camera surveillance systems are needed to mitigate adversarial threats.</p> <p>Security fence around Dazey Lagoon, Security fence around Oriska Lift Station, Security building at south radio tower in Barnes County</p> <p><b>Establish interface between the Barnes County Courthouse, CCHD, Valley City City Hall alarm systems and county dispatch system.</b></p>					
Hazard/Threat Addressed		Civil Disturbance; Criminal, Terrorist, or Nation/State Attack, Fire (Urban), Transportation Incident					
Affected Jurisdiction(s)		City of Valley City and great Barnes County					
Project Status		New					
Priority		Very High					
Responsible Agency		City Council, Emergency Services, Public Works					
Partners		Emergency Management, Dept. Homeland Security, NDDES, private contractors					
Completion Timeframe		3 to 5 years		Cost		Project-specific	
Funding Source		Local budgets and department staff and resources. State Homeland Security Grants.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	4	5	3	5	31
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>			<u>Plan Element Utilized</u>			<u>Process for Integration</u>	
Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA Valley City Capital Improvement Plan Valley City Comprehensive Plan			Capability Assessment, Hazard History, Risk Assessment			Develop scope of work and procure bids/quotes. Select contractor. Apply for grant funding to execute.	

**Barnes County AT-9: Establish pop-up contractor/vendor licensing program.**

Description/Benefit	Disasters and emergency incidents attract fraudulent contractors. Barnes County needs to work with the city of Valley City to set up a system to identify and license valid contractors and workers, and arrest or otherwise identify and dispose of unqualified applicants. Fraudulent contractors have targeted Barnes County and the city of Valley City in the past.		
Hazard/Threat Addressed	Criminal, Terrorist or Nation-State Attack; Fire; Severe Summer Weather; Severe Winter Weather (All)		
Affected Jurisdiction(s)	Barnes County, the city of Valley City, and incorporated jurisdictions		
Project Status	New		
Priority	High		
Responsible Agency	County Commission, City Council(s)		
Partners	Emergency Management, Emergency Services, City Attorney, Barnes County State’s Attorney, Media		
Completion Timeframe	1 year	Cost	Staff time Printable and wearable photo ID system
Funding Source	City and county budgets. State and federal grants.		

**Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)**

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
4	3	5	4	5	5	1	27

**Integration of Mitigation Plan Requirements into Local Planning Mechanisms**

<u>Planning Mechanisms Utilized</u>	<u>Plan Element</u>	<u>Process for Integration</u>
Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA Valley City Capital Improvement Plan	Capability Assessment, Hazard History, Risk Assessment	Establish licensing protocol. Identify and/or purchase printable and wearable photo ID system.

**Barnes County Project AT-10: Support the Dept. of Water Resource’s Base-Level Elevation (BLE)/Flood Risk Mapping Project.**

Description/Benefit	The Dept. of Water Resources received a federal grant from FEMA to conduct a flood risk mapping project to provide base-level elevation engineering information for flood maps. The BLE flood maps can be used to advance the understanding of the impacts of flood and contribute to the development of mitigation projects pertaining to incidents of flood.						
Hazard/Threat Addressed	Flood, Severe Summer Weather, Severe Winter Weather (All)						
Affected Jurisdiction(s)	Barnes County and incorporated jurisdictions						
Project Status	New						
Priority	High						
Responsible Agency	DWR						
Partners	City Council, County Commission, Emergency Management, Emergency Services, Public Works, Road Department						
Completion Timeframe	5 years	Cost	100% federally funded – managed by NDDES				
Funding Source	Local budgets. State and federal grants.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Flood Ordinances National Flood Insurance Program Valley City Capital Improvement Plan Valley City Comprehensive Plan Valley City Emergency Flood Plan		Capability Assessment, Hazard History, Risk Assessment			Support collaborative efforts between DWR and local agencies to ensure project success and completion.		



**Barnes County Project EO-1: Conduct education and outreach to improve household disaster preparedness through use of websites, social media, local media outlets, utility inserts, mailings, etc. Develop new websites and media outlets where necessary.**

Description/Benefit	Continued education and outreach to keep households and vulnerable populations ready in case of a disaster. Special attention paid to maintaining and further developing severe weather awareness campaign, are you prepared information, shelter-in-place pamphlets, fire prevention, school safety, storm spotters’ program, among others. Specific attention should be given to flooding, hazardous materials, severe weather, fire, and on truck routes and safe routes to school. Outreach and attention should be given to mass notification systems.  <b>Existing:</b> <u>Social Media</u> - Barnes County, Barnes County Dispatch, Barnes County Sheriff’s Office, and Barnes County Emergency Management, Facebook and Instagram pages. <u>Websites</u> - cities of Valley City, all private and public schools in Barnes County, City of Wimbledon, Valley City State University  <b>Develop new:</b> Pursue additional social media platforms and/or websites for incorporated cities						
Hazard/Threat Addressed	All hazards						
Affected Jurisdiction(s)	Barnes County and incorporated jurisdictions						
Project Status	New/Ongoing and Continue						
Priority	High						
Responsible Agency	City Council(s), County Commission, Emergency Management, Public Schools						
Partners	Emergency Services, Extension, Media, Public Health, Public Utilities, Social Services, VOAD						
Completion Timeframe	Ongoing	Cost	Staff time. Up to \$10,000 annually				
Funding Source	Local resources. State and federal grants. Tier II.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP Barnes County Hazard Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Develop and review by appropriate jurisdictions or agencies. Review by state’s attorney. Distribute by mail and/or publish online.		

**Barnes County Project EO-2: Increase awareness of methods for prevention of infectious disease.**

Description/Benefit		Make public aware of risk of infectious diseases and methods for prevention in people, animals and crops to reduce and/or eliminate losses to the economy and loss of life. Methods should utilize the “Whole-Community” approach, handwashing, infectious disease preparedness, environmental health, and strategies used in agriculture-based economies such as pesticides, fungicides, herbicides, and insecticides.					
		New and future awareness should include education on social distancing and other measures to prevent the spread of disease.					
Hazard/Threat Addressed		Infectious Disease (All)					
Affected Jurisdiction(s)		Barnes County and incorporated jurisdictions					
Project Status		Ongoing and Continue					
Priority		Very High					
Responsible Agency		Extension, NDDA/State Veterinarian, local veterinarians, Public Health, Weed Board					
Partners		Barnes County Commission, City Council(s), Emergency Management, Emergency Services, FSA, NDDH, Medical Services Providers, NRCS, RD, Stockmen’s Association, USDA					
Completion Timeframe		Ongoing	Cost	Project-specific			
Funding Source		Local, state, and federal budgets or grants. Extension. Public Health – Barnes County On The Move Grant (more chronic than infectious), Regional Opioid Prevention Education and Support (ROPES), State Opioid Response (SOR)					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	5	5	5	33
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
City-County Health District (all plans) Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Development by respective agency. Approval by administrator/board, county commission, city council(s) and/or emergency management. Distribute by mail and/or publish online, organize radio announcements, run newspaper ads, and social media.		

**Barnes County Project EO-3: Update Barnes County Vaccination Outreach Plan annually.**

Description/Benefit	The influenza vaccination rate for school-aged children in Barnes County needs to be increased. Develop outreach to increase this rate to 100 percent. Recent immunization funding from the N.D. of Health will assist CCHD in increasing immunizations, creating a written outreach plan, and identify strategies to improve vaccine confidence in the community.		
Hazard/Threat Addressed	Infectious Disease (only those that are vaccine preventable)		
Affected Jurisdiction(s)	Barnes County, incorporated jurisdictions and unincorporated jurisdictions. Specific attention paid to communities with schools, care centers/nursing homes, higher education, and institutionalized populations (Barnes County Correctional Center, people with disabilities/group homes, etc.)		
Project Status	New/Ongoing and Continue (new to the mitigation plan, but has always been executed by public health)		
Priority	High		
Responsible Agency	Public Health		
Partners	City Council(s), Emergency Management, Emergency Services, Medical Services Providers, Public Schools, Social Services, faith-based organizations. Local businesses and community champions.		
Completion Timeframe	Ongoing	Cost	Staff time and printing
Funding Source	Public Health. N.D. Dept. of Health Immunization grant funding.		

**Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)**

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	4	5	5	32

**Integration of Mitigation Plan Requirements into Local Planning Mechanisms**

<u>Planning Mechanisms Utilized</u>	<u>Plan Element</u>	<u>Process for Integration</u>
City-County Health District (all plans) Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA	Capability Assessment, Hazard History, Risk Assessment	Develop by City-County Health District. Approval by board, public schools and emergency management. Distribute.

**Barnes County Project EO-4: Update Barnes County Health Equity Plan annually.**

Description/Benefit	The plan assures all residents of Barnes County have access to vaccines and healthcare. The goal of the plan is to reduce health disparities.						
Hazard/Threat Addressed	Infectious Disease						
Affected Jurisdiction(s)	Barnes County and incorporated jurisdictions						
Project Status	New/Ongoing and Continue (new to the mitigation plan, but has always been executed by public health)						
Priority	High						
Responsible Agency	Public Health						
Partners	City Council(s), Emergency Management, Emergency Services, Medical Services Providers, Public Schools, Social Services, faith-based organizations. Local businesses and community champions.						
Completion Timeframe	Ongoing	Cost	Staff time and printing				
Funding Source	Public Health. N.D. Dept. of Health - Health Equity Grant.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	4	5	5	32
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
City-County Health District (all plans) Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Conduct update planning process by City-County Health District. Incorporate into other existing plans. Share with emergency management and other public agencies.		

**Barnes County Project EO-5: Implement Livestock Outreach Program.**

Description/Benefit	Water and Feed Quality Program. Test the safety of water and feed for livestock to reduce the loss of livestock due to poor and/or inadequate water quality. NDSU Extension has already developed the program, but it needs to be delivered locally.						
Hazard/Threat Addressed	Dam Failure, Drought, Flood, Infectious Disease, Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	Barnes County and incorporated jurisdictions						
Project Status	New/Ongoing and Continue						
Priority	High						
Responsible Agency	Extension						
Partners	County Commission, Emergency Management, FSA, NRCS, Producers						
Completion Timeframe	1 to 2 years/ongoing	Cost	\$3,000.00/staff time				
Funding Source	NDSU Extension/Barnes County. County budget. Federal and state grants (pay for water and feed test equipment)						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Drought Management Plan (State of North Dakota) Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Development by NDSU Extension/Barnes County. Conduct education and outreach process thereafter.		

**Barnes County Project EO-6: Increase awareness of drought tolerant practices and soil conservation methods in farming and ranching, and municipalities.**

Description/Benefit	Make public aware of crop programs, and drought tolerant practices and soil conversation methods in farming and ranching. Educating the public on rationing/restrictions on livestock feed and water usage. Prevent loss of crops and livestock during drought. Information for municipalities should focus on water conservation practices.		
Hazard/Threat Addressed	Drought, Fire (Wildland), Severe Summer Weather, Severe Winter Weather		
Affected Jurisdiction(s)	Barnes County and incorporated jurisdictions		
Project Status	Ongoing and Continue		
Priority	Medium		
Responsible Agency	Extension Service, FSA, NRCS, SCD		
Partners	Emergency Management, Bureau of Reclamation, city & county governments, grain elevators, fire departments/districts, insurance agents, DWR, USACE		
Completion Timeframe	Ongoing	Cost	Specific to individual awareness programs
Funding Source	Local resources. North Dakota State University. NRCS. Rural Development. State and federal grants.		

**Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)**

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	5	4	5	31

**Integration of Mitigation Plan Requirements into Local Planning Mechanisms**

<u>Planning Mechanisms Utilized</u>	<u>Plan Element</u>	<u>Process for Integration</u>
Bovine Emergency Response Plan (BERP) Drought Management Plan (State of North Dakota) Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA	Capability Assessment, Hazard History, Risk Assessment	Development by Extension. Approval by county commission, city councils and emergency management. Distribute.

**Barnes County Project EO-7: Conduct continuous preventative education to increase awareness of cyberattack threats.**

Description/Benefit		<p>Make public aware of risk of cyberattacks such as Advanced Persistent Threats, Distributed Denial of Service, Doxing, Media Threats, Password Phishing Attacks, Socially Engineered Malware and Unpatched Software. <b>Specific attention should be paid to the framework developed and included in the K20W Initiative.</b></p> <p><b>Barnes County:</b> Currently conducts informal education through guides, e-mails, and in-person training on what to look for in cyberattacks. Develop formal education methods through vendors.</p> <p><b>Valley City State University:</b> Conducts an annual in-house education program to staff and students.</p>					
Hazard/Threat Addressed		Cyberattack					
Affected Jurisdiction(s)		Barnes County and incorporated jurisdictions					
Project Status		New					
Priority		High					
Responsible Agency		Barnes County IT, Valley City State University IT (N.D. University System), public schools					
Partners		NDIT/N.D. Legislature, City Council(s), County Commission, Emergency Management, Emergency Services					
Completion Timeframe		Ongoing	Cost		Project-specific		
Funding Source		Local budgets. State and federal grants. N.D. Legislature.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	4	5	34
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Valley City Public Schools Cyberattack Response Plan Barnes County Cyberattack Response Plan Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA University of Valley City Cyberattack Response Plan		Capability Assessment, Hazard History, Risk Assessment			Development by Barnes County Office of Emergency Management and IT, VCSU, public schools, and NDIT. Approval by county commission, city councils, emergency management and IT, university system, and public-school districts. Distribute.		

**Barnes County Project EO-8: Make public aware of risk of shortage or outage of critical materials or infrastructure and encourage citizens to be proactive and self-sufficient.**

Description/Benefit	Make public aware of risk of shortage of critical materials and/or infrastructure and encourage citizens to be self-sufficient.  <b>Educate residents on the importance of shelter-in-place, stocking of food, water, and medical supplies, fuel for heating, backup power generation, etc.</b>						
Hazard/Threat Addressed	All						
Affected Jurisdiction(s)	Barnes County and incorporated jurisdictions						
Project Status	Ongoing and continue						
Priority	High						
Responsible Agency	Emergency Management, Emergency Services, Public Schools, Social Services						
Partners	County Commission, City Councils, Extension, Food Pantries, Media, NDDDES, NDDH, Public Health, Public Utilities, Volunteer Organizations Aiding in Disaster (VOAD)						
Completion Timeframe	Ongoing	Cost	TBD				
Funding Source	Local budgets. State and federal grants. Private sector.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
4	5	5	5	5	4	5	33
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA City-County Health District Plans (all) State Vulnerable Populations Plan		Capability Assessment, Hazard History, Risk Assessment			Development by Emergency Management, Public Health, Public Schools, and Public Utilities. Approval by county commission, city councils, school boards. Distribute.		



**Barnes County Project EO-9: Encourage farmers and the public to have insurance to protect from crop and property losses from hazards.**

Description/Benefit	Benefit to crop insurance, residential conservation practices, and property insurance. Protect the personal assets of businesses and citizens risk to natural hazards and threats. <b>A priority should be given to the NFIP.</b>		
Hazard/Threat Addressed	Drought, Fire (Wildland), Flood, Severe Summer Weather, Severe Winter Weather, Urban Fire/Structure Collapse, (All)		
Affected Jurisdiction(s)	Barnes County and incorporated jurisdictions		
Project Status	Ongoing and continue		
Priority	Medium		
Responsible Agency	Banking industry, Extension, FSA, NRCS, SCD, private insurance companies		
Partners	County Commission, Emergency Management (NFIP), agricultural producers		
Completion Timeframe	Ongoing	Cost	\$0 for a local PSA; \$1,000 to \$3,000/week for substantial outreach
Funding Source	Local budgets. State and federal grants. Private sector.		

**Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)**

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
4	5	5	4	5	5	5	33

**Integration of Mitigation Plan Requirements into Local Planning Mechanisms**

<u>Planning Mechanisms Utilized</u>	<u>Plan Element</u>	<u>Process for Integration</u>
Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA City-County Health District Plans (all) State Vulnerable Populations Plan	Capability Assessment, Hazard History, Risk Assessment	Development by Emergency Management, Public Health, Public Schools, and Public Utilities. Approval by county commission, city councils, school boards. Distribute.

**Barnes County Project EO-10: Conduct education and outreach on fire safety and prevention, burn bans, state fire indexes, and regional/state burning regulations and bans.**

Description/Benefit	Make the public aware of methods to remain safe from risk of fire and potential prevention methods. Keep areas around buildings and structures clear of grass, overgrown vegetation and debris. Specific attention should be paid to property owners in city limits with substantial vegetation to reduce fuels for wildland fires. Education the public on burn bans and state fire indexes. Reduce risk of fire hazard from outdoor burning by residents and providing means of communication.						
Hazard/Threat Addressed	Drought, Fire (Wildland), Hazard Material Release, Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	Barnes County and incorporated jurisdictions						
Project Status	Ongoing and continue						
Priority	High. Primarily summer but can occur in spring and fall.						
Responsible Agency	Emergency Management, Emergency Services						
Partners	Barnes County Commission, Extension, fire departments/districts, NDDDES, NRCS, NWS, SCD						
Completion Timeframe	Ongoing	Cost	\$0 for a local PSA; \$1,000 to \$3,000/week for substantial outreach				
Funding Source	Local budgets. State and federal grants.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Development by Emergency Management and Emergency Services. Approval by county commission. Distribute.		

**Barnes County F-1: Expand and improve existing or implement new financial mitigation capabilities.**

Description/Benefit	Expand financial mitigation capabilities to generate funds for completion of mitigation projects. <ul style="list-style-type: none"> <li>• <b>Create and implement impact fees for new development.</b></li> <li>• <b>Restructure and improve building/zoning permit fees on a continuous basis.</b></li> <li>• <b>Restructure and increase utility fees (water, sewer, electric) based on projected future infrastructure maintenance costs and necessary capital improvements.</b></li> <li>• <b>Research additional revenue generators such as an electricity utility fee, wheel tax, etc.</b></li> <li>• <b>Investigate new grant funding opportunities through FEMA and other local, state, and federal sources – See Chapter 7.2</b></li> </ul>						
Hazard/Threat Addressed	All						
Affected Jurisdiction(s)	Barnes County and incorporated jurisdictions						
Project Status	New						
Priority	Very High						
Responsible Agency	County Commission and City Council(s)						
Partners	Emergency Management, Emergency Services, NDAC, NDLC, Planning & Zoning, Public Utilities						
Completion Timeframe	Ongoing			Cost	Staff-time		
Funding Source	Local budgets and staff time.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
3	5	5	2	5	5	5	30
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
City Councils and County Commission Planning Commission		Capability Assessment, Hazard History, Risk Assessment			Research effectiveness. Approval and adoption by county commission and city councils.		

**Barnes County Project PR-1: Assure Barnes County, North Dakota has FEMA-Approved Mitigation Plan.**

Description/Benefit		Continuous assessment of vulnerabilities to the county and incorporated jurisdiction, and update of hazards and impacts, monitoring of mitigation project implementation and progress.					
		<b>Update plan on a continuing basis between plan update grant applications. See Chapter 10 and Appendix 8 of this plan.</b>					
Hazard/Threat Addressed		All					
Affected Jurisdiction(s)		Barnes County and incorporated jurisdictions					
Project Status		New					
Priority		Very High					
Responsible Agency		County Commission, Emergency Management					
Partners		City Council(s), Emergency Services, Extension, Planning & Zoning, Public Health, Public Works, DWR, Water Resource District					
Completion Timeframe		4 to 5 years	Cost	\$25,000 to \$50,000 (update of plan)			
Funding Source		Local budgets. FEMA’s HMGP or BRIC Grant program.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Hazard Mitigation Plan (all other existing mechanisms)		All elements			Adoption by county commission and city councils. Approval NDDDES and FEMA.		

**Barnes County PR-2: Update/expand existing and/or create new planning and regulatory capabilities to address existing and new development to strengthen local planning processes.**

Description/Benefit		<p>Build the planning and regulatory capability of Barnes County and incorporated jurisdictions by updating existing and/or expand and create new plans, policies, and ordinances. To ensure new and existing structures adhere to building standards to withstand impacts from hazards, and new development is located outside hazardous areas. Energy development (oil and gas) in the western portions of the state may lead to economic and population growth in the future. <b>Specific research should be conducted to address building codes, continuity of operations, capital improvement plans for smaller jurisdictions, comprehensive planning, community fire/wildfire protection, drought management, flood ordinances and management, hazardous materials, impact fees, land use, mitigation, multi-hazard evacuation, site plan review, storm water management, and water conservation.</b></p> <p><b><u>Special attention should be paid to the Barnes County Point-of-Dispensing (POD) Plan to secure an indoor drive-through location for mass vaccinations and/or testing.</u></b></p> <p>Additional consideration should be given to prioritize sewer backup valves when upgrading existing or building new development, redundancies in the power grid, and tie-down procedures for temporary buildings. Assure new development is built in areas with low risk to hazards.</p> <p>A list of plans, policies, codes and ordinances is shown in Chapter 7, Capability Assessment.</p>					
Hazard/Threat Addressed		All					
Affected Jurisdiction(s)		Barnes County and incorporated jurisdictions					
Project Status		New					
Priority		High					
Responsible Agency		City Council(s), County Commission, Planning & Zoning					
Partners		Emergency Management, Emergency Services, NDDC, NDACo, NDDES, NDLC, Public Health, Public Works, RD					
Completion Timeframe		Ongoing	Cost	\$0 to \$100,000 / Staff-time			
Funding Source		Local budgets. Local, state and federal grants. Private sector.					
<b>Values: 1 is low (negative impact and/or too costly) – Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
4	4	4	3	4	5	5	28
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
All		Capability Assessment, Hazard History, Risk Assessment			Develop, review, and approve by county commission and city councils.		

**Barnes County PR-3: Encourage jurisdictional participation in the National Flood Insurance Program (NFIP).**

Description/Benefit	Ensure economic resiliency. Residents with property at risk would be insured. Ensure continuous review and updating or implementation of flood ordinances and flood control measures.						
Hazard/Threat Addressed	Flood (overland and riverine), Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	Barnes County and the cities of Kathryn, Litchville, Valley City, and Wimbledon						
Project Status	Ongoing and Continue						
Priority	Very High						
Responsible Agency	County Commission, City Council(s), Emergency Management						
Partners	Planning & Zoning, DWR, Water Resource Board						
Completion Timeframe	Ongoing	Cost	\$0 to \$1,000 / staff time				
Funding Source	Local staff-time. FEMA. DWR.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
3	5	4	4	5	5	5	32
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Flood Ordinances National Flood Insurance Program Valley City Emergency Flood Plan Barnes County Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Approval and adoption by county commission and city councils		

**Barnes County PR-4: Encourage jurisdictions to review local flood ordinances to meet or exceed minimum federal and state requirements, comply with the NFIP (once enrolled) and enroll in the Community Rating System.**

Description/Benefit	To ensure Barnes County and incorporated jurisdictions meet or exceed the NFIP and/or to prepare for enrollment in the NFIP. Review of ordinances to ensure they meet minimum federal and state requirements.		
Hazard/Threat Addressed	Flood (overland and riverine), Severe Summer Weather, Severe Winter Weather		
Affected Jurisdiction(s)	Barnes Count and the cities of Kathryn, Litchville, Valley City, and Wimbledon. All other incorporated jurisdictions that are not enrolled.		
Project Status	Ongoing and continue		
Priority	High		
Responsible Agency	County Commission, City Councils, Emergency Management, Planning & Zoning		
Partners	Emergency Services, FEMA, insurance agents NDACo, NDDDES, NDLC, DWR		
Completion Timeframe	Ongoing	Cost	\$0 to \$1,000 / staff time
Funding Source	Local staff-time. FEMA. DWR.		

**Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)**

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	5	5	5	34

**Integration of Mitigation Plan Requirements into Local Planning Mechanisms**

<u>Planning Mechanisms Utilized</u>	<u>Plan Element Utilized</u>	<u>Process for Integration</u>
Barnes County LEOP & Mitigation Plan Barnes County THIRA Flood Ordinances National Flood Insurance Program Valley City Comprehensive Plan Valley City Emergency Flood Plan	Capability Assessment, Hazard History, Risk Assessment	Approval and adoption by county commission and city councils.

**Barnes County PR-5: Remove existing structures from flood prone areas.**

Description/Benefit		Removal of repetitive loss properties to increase economic resiliency. Residents with property at risk would be protected. Convert former lots into greenway/recreation areas for improved quality of life.					
Hazard/Threat Addressed		Flood (overland and riverine), Severe Summer Weather, Severe Winter Weather					
Affected Jurisdiction(s)		Barnes County and the cities of Dazey, Fingal, Kathryn, Leal, Litchville, Nome, Oriska, Pillsbury, Rogers, Sanborn, Sibley, Valley City, and Wimbledon					
Project Status		Ongoing and continue					
Priority		High					
Responsible Agency		County Commission, City Councils, Emergency Management, Planning & Zoning					
Partners		Emergency Services, FEMA, insurance agents NDACo, NDDDES, NDLC, DWR					
Completion Timeframe		Ongoing	Cost		\$50,000 to \$300,000 depending on the property and structure.		
Funding Source		Local staff-time. FEMA. DWR.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	2	5	5	5	32
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA Flood Ordinances National Flood Insurance Program		Capability Assessment, Hazard History, Risk Assessment			Approval and adoption by county commission and city councils.		



**Barnes County PR-6: Partner with city of Valley City to create post-disaster debris management plan.**

Description/Benefit	Provide temporary staging site for disposal of waste from structures to improve resiliency and recovery efforts and maintain quality of life. The plan should be updated annually. The city of Valley City’s transfer station/inert landfill has the capacity to stage post-disaster debris for disposal purposes.  <b>Establishment of a management plan increases disaster reimbursement from FEMA by five percent.</b>						
Hazard/Threat Addressed	All						
Affected Jurisdiction(s)	Barnes County and incorporated jurisdictions						
Project Status	Ongoing and Continue						
Priority	High						
Responsible Agency	Barnes County Commission, Emergency Management, CCHD, city councils, townships						
Partners	City & county public works depts., Emergency Services, engineering firms, Highway Department, NDDH, private landowners, regional council						
Completion Timeframe	1 to 3 years		Cost	\$0 to \$3,000			
Funding Source	Local budgets.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
4	5	5	4	2	5	3	28
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
City-County Health District (all plans) Planning Commission Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Organize and update annual review. Approval and adoption by county commission and city councils.		

**Barnes County PR-7: Update Barnes County Planning and Zoning Ordinances to incorporate the N.D. Geological Survey 1:24,000 Landslide Area Map Series.**

Description/Benefit	The N.D. Geological Survey 1:24,000 Landslide Area Map Series identifies areas in Barnes County prone to impacts from geologic hazards (landslides) and, therefore, are not prone to development. These areas should be restricted to mitigate impacts to existing, and new and future development.		
Hazard/Threat Addressed	Drought, Flood, Geologic Hazards, Severe Summer Weather, Severe Winter Weather		
Affected Jurisdiction(s)	Barnes County and incorporated jurisdictions		
Project Status	New		
Priority	High		
Responsible Agency	Emergency Management, Planning & Zoning, Public Works		
Partners	County Commission, NDACo, NDGS		
Completion Timeframe	By the end of 2022	Cost	Staff time
Funding Source	Local budgets.		

**Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)**

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
3	5	5	1	1	5	5	25

**Integration of Mitigation Plan Requirements into Local Planning Mechanisms**

<u>Planning Mechanisms Utilized</u>	<u>Plan Element</u>	<u>Process for Integration</u>
Barnes County LEOP & Mitigation Plan Barnes County THIRA Barnes County Zoning Building Permits	Capability Assessment, Hazard History, Risk Assessment	Development of guidelines/ordinances based on information in the N.D. Geological Survey 1:24,000 Landslide Area Map Series. Approval by county commission.

**Barnes County PR-8: Create Bovine Emergency Response Plan (BERP).**

Description/Benefit	Gives first responders a standard operating procedure on how to mitigate issues pertaining bovine losses from natural hazards or man-made threats. The plan also assures public safety first and foremost, first responder safety, and animal well-being.						
Hazard/Threat Addressed	Civil Disturbance, Dam Failure, Drought, Fire (Wildland), Flood, Hazardous Material Release, Infectious Disease, Severe Summer Weather, Severe Summer Weather, Transportation Incident						
Affected Jurisdiction(s)	Barnes County and incorporated jurisdictions						
Project Status	New						
Priority	Medium/High						
Responsible Agency	Emergency Management, Extension, NRCS, emergency services (ambulance, fire, law enforcement)						
Partners	N.D. Dept. of Agriculture, N.D. State Vet Office, local producers and/or veterinarians, wrecker services						
Completion Timeframe	1 to 2 years	Cost	\$75 to \$100 per person – Lisa Peterson				
Funding Source	Central Grasslands Research Extension Center. N.D. Beef Commission. Local budgets.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	5	4	5	33
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<b><u>Planning Mechanisms Utilized</u></b>		<b><u>Plan Element</u></b>			<b><u>Process for Integration</u></b>		
Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Schedule training and education event with Central Grasslands Research Extension Center. Develop draft plan and finalize. Integrate into local emergency operations plan, emergency services and response protocols.		

**Barnes County PR-9: Create Community Wildfire Protection Plan (CWPP).**

Description/Benefit		<p><b>Barnes County, incorporated jurisdictions, and unincorporated jurisdictions are becoming increasingly vulnerable to wildland fire due to an increase in the frequency and severity in drought and severe summer weather, and a growing interaction with its rural residential populations and the Wildland-Urban Interface.</b></p> <p>A Community Wildfire Protection Plan (CWPP) identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment on Federal and non-Federal land that will protect one or more at-risk communities and essential infrastructure. The CWPP recommends measures to reduce structural ignitability throughout the at-risk community, and may also address issues such as wildfire response, hazard mitigation, community preparedness, or structure protection - or all the above. The plan is developed in a collaborative framework between local government, local fire department(s), other stakeholders, and federal land management agencies that manage land in the planning area.</p> <p><b>The plan should place emphasis on achieving Firewise Certification for appropriate communities - <a href="https://rb.gv/uav9w5">https://rb.gv/uav9w5</a></b></p>					
Hazard/Threat Addressed		Drought, Wildland Fire, Severe Summer Weather, Transportation Incident					
Affected Jurisdiction(s)		Barnes County and incorporated jurisdictions					
Project Status		New					
Priority		High					
Responsible Agency		County Commission, Emergency Management, Emergency Services, Planning & Zoning, Public Works					
Partners		City Council(s), NDDES, Public Health, Public Utilities, DWR, Water Resource Board					
Completion Timeframe		2 to 3 years	Cost	\$25,000 to \$35,000			
Funding Source		Local budgets. State and federal grants. FEMA’s Building Resilient Infrastructure and Communities (BRIC)/Pre-Disaster Mitigation (PDM) Grant Program.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	3	5	4	4	30
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Budget for the plan locally or obtain grant funding. Identify Steering Committee to direct the planning process. Adoption by city councils, county commission and fire departments.		

**Barnes County PR-10: Encourage jurisdictions to adopt building codes.**

Description/Benefit	To ensure new and existing structures adhere to building standards to withstand impacts from hazards.  <b>The Barnes County Planning and Zoning Administrator is offering building inspection services starting in 2021.</b>						
Hazard/Threat Addressed	All						
Affected Jurisdiction(s)	Incorporated Jurisdictions of Dazey, Litchville, Pillsbury, Rogers, Sibley, and Wimbledon						
Project Status	Ongoing and Continue						
Priority	Very High						
Responsible Agency	City councils, County Commission						
Partners	NDACo, NDDC, NDLC, NDTOA, ND Fire Marshal's Office						
Completion Timeframe	Ongoing	Cost	\$25,000 to \$35,000				
Funding Source	Local budgets.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
4	5	3	3	5	5	5	30
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA Barnes County Zoning Building Permits		Capability Assessment, Hazard History, Risk Assessment			Identify as adoption of buildings codes as an objective and/or action in the county's comprehensive plan. Encourage jurisdictions to adopt. Enforcement is the second part		

**Barnes County PR-11: Relocate existing propane, anhydrous and fuel tanks, and fertilizer plants away from residential areas and community assets to areas with conducive uses.**

Description/Benefit	Removal of hazardous material storage areas from areas containing occupied structures to eliminate or reduce losses to people and property.						
Hazard/Threat Addressed	Fire, Hazardous Material Release (All)						
Affected Jurisdiction(s)	Barnes County and incorporated jurisdictions						
Project Status	Ongoing and Continue						
Priority	High						
Responsible Agency	City councils, Planning & Zoning						
Partners	Grain elevators; county; fuel, propane, and chemical companies.						
Completion Timeframe	Ongoing	Cost	Private sources				
Funding Source	Project specific						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
4	5	5	3	3	3	5	28
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA Barnes County Zoning Building Permits		Capability Assessment, Hazard History, Risk Assessment			Identify location of Tier II sites and other areas with chemical storage. Research alternative sites.		

**Barnes County Project I-1: Assure continued monitoring and maintenance of the High Hazard Dams (Baldhill Dam and Clausen Springs Dam), and all other dams in or impacting Barnes County, as necessary.**

Description/Benefit	<p>To protect human life and property from dam failures. The inundation area for the Baldhill Dam includes large geographic areas of the city of Valley City/Barnes County, most of its population, and critical facilities and infrastructure. <b><u>EAPs and contact information should be updated on an annual basis for each respective dam.</u></b></p> <p><b>Includes Little Dam in the city of Valley City which is owned and maintained by the county.</b></p> <p><b>See Chapter 4.4 Dam Failure for additional information on high dams in Barnes County. A full list of dams in Barnes County can be found in the hazard history for the county on a disc at the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment in this plan.</b></p>		
Hazard/Threat Addressed	Dam Failure, Flood, Severe Summer Weather, Severe Winter Weather		
Affected Jurisdictions	Barnes County, cities of Kathryn and Valley City		
Project Status	Ongoing and Continue		
Priority	Very High		
Responsible Agency	Barnes County, USACE		
Partners	City Council(s), County Commission, Emergency Management, Engineering, Public Works, DWR, Water Resource District		
Completion Timeframe	Ongoing	Cost	To be determined. Project specific.
Funding Source	U.S. Dept. of Defense – USACE. FEMA. Local, state, and federal budgets, grants, and resources. Private dam owners.		

**Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)**

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	2	5	32

**Integration of Mitigation Plan Requirements into Local Planning Mechanisms**

<u>Planning Mechanisms Utilized</u>	<u>Plan Element Utilized</u>	<u>Process for Integration</u>
Emergency Action Plans (EAPs) for each respective dam Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA Valley City Emergency Flood Plan	Capability Assessment, Hazard History, Risk Assessment, dam failure atistics	Incorporation of emergency action plan practices in county emergency management response and planning procedures and the valley City Emergency Flood Plan. Approval by city and county commission. Continued support of dam owner/agencies by Barnes County.

**Barnes County Project I-2: Retrofit and/or upgrade bridges, culverts, stormwater pipes, railroads, and roads grades to withstand natural hazards and prevent blockage to maintain access for emergency services.**

Description/Benefit		Increase resiliency of bridges, culverts, and roads to maintain transportation to assure economic vitality and access for emergency services. The following bridges, culverts, and roads are impacted by overland flooding issues and severe weather:					
Hazard/Threat Addressed		Drought, Fire (Wildland), Flood (overland and riverine), Hazardous Material Release, Severe Summer Weather, Severe Winter Weather (All)					
Affected Jurisdiction(s)		Barnes County and incorporated jurisdictions					
Project Status		Ongoing and Continue/New					
Priority		Very High					
Responsible Agency		County Commission, FHWA, FRA, <b>Highway Department</b> , NDDOT, Public Works, Water Resource Board					
Partners		Emergency Management, Emergency Services, Planning & Zoning					
Completion Timeframe		Ongoing	Cost	Project-specific			
Funding Source		FHWA, FRA and NDDOT. FEMA Hazard Mitigation, Section 406. State and federal grants.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
4	5	5	5	5	3	3	30
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA N.D. Dept. of Transportation State Transportation Improvement Plan (STIP)		Capability Assessment, Hazard History, Risk Assessment			Develop engineering specifications. Secure funding. Approval and adoption by county commission and city councils.		



**Barnes County Project I-2: Retrofit and/or upgrade bridges, culverts, stormwater pipes, railroads, and roads grades to withstand natural hazards and prevent blockage to maintain access for emergency services.**

Bridges

Culverts

Pipes (stormwater)

Railroad

Road Retrofits and/or Grade Raises

Underpasses

**Barnes County Project I-3/City of Valley City Project I-3: Construct new storm shelters/community safe rooms or retrofit existing structures to reduce the risk to vulnerable populations.**

Description/Benefit		<p>Provide safe area of refuge for permanent residents, temporary populations, and seasonal/recreational populations from severe weather. Reduce/eliminate loss of life from hazards and man-made threats. Upgrade existing shelters to be fully ADA compliant and pet friendly. Construct new storm shelters/community safe room in jurisdictions currently lacking a storm shelter/safe room. More information on community shelters can be found through the following link: <a href="https://www.fema.gov/media-library/assets/documents/5090">https://www.fema.gov/media-library/assets/documents/5090</a></p> <p>Manufactured home communities are susceptible to inclement weather and therefore are highly vulnerable. Zoning ordinances need to be updated to require sheltering capacity be included in new manufactured housing developments and incorporated into existing developments.</p> <p><b>Upgrade:</b> Graichen Gym at VCSU, Holy Trinity Church in Oriska, Methodist Church in Valley City, former elementary school in Oriska, Valley City Auditorium, Valley City High School, Valley City Rec Center, Valley City State University, We Osmon Fieldhouse at VCSU</p> <p><b>New:</b> City of Valley City Dog Pound or mobile animal shelter units, Baldhill Dam, Little Yellowstone Park, Clausen Springs Park, City of Pillsbury, City of Rogers, City of Sanborn, City of Sibley, City of Wimbledon</p>						
Hazard/Threat Addressed		All						
Affected Jurisdiction(s)		Barnes County and incorporated jurisdictions						
Project Status		Ongoing and Continue/New						
Priority		High						
Responsible Agency		Emergency Management, Emergency Services						
Partners		County Commission, City Council(s), NDDES, Red Cross, Social Services, private housing/community owners						
Completion Timeframe		3 to 5 years			Cost	\$75,000.00 to \$150,000.00 per shelter		
Funding Source		Local, state and federal grants. FEMA Pre-Disaster Mitigation Grant Program (PDM).						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>								
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL	
5	5	5	4	5	4	4	32	
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>								
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>			
Barnes County LEOP Barnes County Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Approval by county commission, city councils, and private house/community owners			

**Barnes County I-4/ City of Valley City Project I-4/: Maintain Sheyenne River Channel.**

Description/Benefit		Removal of debris to maintain flow of runoff to reduce/eliminate flooding and standing water, and control growth of vegetation to minimize fire hazard, spread of disease, and severe weather impacts. Also, rebuild and stabilize riverbanks where necessary to reduce or eliminate flooding impacts on the city and its infrastructure.					
		<ul style="list-style-type: none"> <li>• Near Chautauqua Boulevard and 12<sup>th</sup> St. NE</li> <li>• 3<sup>rd</sup> Ave SE Bridge</li> <li>• Near 5<sup>th</sup> Ave SW and 3<sup>rd</sup> St. SW</li> <li>• 6<sup>th</sup> Ave SW and 6<sup>th</sup> St. SW</li> <li>• Riverview Drive</li> <li>• Bjornson Golf Course</li> </ul>					
Hazard/Threat Addressed		Flood (overland and riverine), Infectious Disease, Severe Summer Weather, Severe Winter Weather					
Affected Jurisdiction(s)		City of Valley City and greater Barnes County					
Project Status		Complete. Ongoing and continue.					
Priority		High					
Responsible Agency		City Council, FEMA, NDDDES, Public Works, SWC, USACE					
Partners		Emergency Management, Emergency Services, Water Resource Board					
Completion Timeframe		Ongoing	Cost	Project-specific			
Funding Source		Local budgets and department staff and resources. FEMA’s Section 404 – Hazard Mitigation.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	2	3	3	3	26
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Flood Ordinances National Flood Insurance Program Valley City Comprehensive Plan Valley City Emergency Flood Plan		Capability Assessment, Hazard History, Risk Assessment			Commission studies through a formal bidding process. Select contractor. Apply for grant funding to execute or budget in local budgets.		

**Barnes County Project I-5: Remove existing infrastructure and structures from areas prone to geologic hazards.**

Description/Benefit	<p>Economic resiliency. Residents with property at risk would be protected. Convert former lots into open space or wildlife habitat.</p> <ul style="list-style-type: none"> <li>• Cabins, structures, infrastructure on the west side of Lake Ashtabula</li> <li>• I-94 westbound, between exit 292 and 290, north side of roadway, approximate cost of \$8.4 million</li> <li>• I-94 eastbound, the SW corner of exit 290, approximate cost of \$0.4 million</li> <li>• See the history section in Chapter 4.8, Geologic Hazard for additional infrastructure and structures</li> </ul>						
Hazard/Threat Addressed	Flooding, Geologic Hazards, Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	Barnes County and incorporated jurisdictions						
Project Status	Complete. Ongoing and continue.						
Priority	High						
Responsible Agency	City Council, Emergency Management, Public Works						
Partners	Emergency Management, Emergency Services, FEMA, NDDDES, NDGS, PSC, DWR, USACE						
Completion Timeframe	10 years	Cost	\$100,000 to \$1,000,000 per structure				
Funding Source	Local budgets and departments staff and resources. State Homeland Security Grants.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
3	5	5	3	3	3	5	27
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Valley City Capital Improvement Plan Valley City Comprehensive Plan Valley City Transportation Plan Valley City Emergency Flood Plan		Capability Assessment, Hazard History, Risk Assessment			Develop scope of work and procure bids/quotes. Select contractor. Apply for grant funding to execute.		

## 7. Mitigation Capability

Capability for mitigation is divided into four categories: Administrative and Technical, Education and Outreach, Financial, and Planning and Regulatory. Chapter 7.1 provides an assessment of the mitigation capabilities of Barnes County and incorporated jurisdictions.

- Table 7.1.1 highlights **administrative and technical** capabilities.
- Table 7.1.2 highlights **education and outreach** capabilities.
- Table 7.1.3 highlights **financial** capabilities.
- Table 7.1.4 highlights **planning and regulatory** capabilities.
- Table 7.1.5 shows the **utilization of planning mechanisms** in Barnes County by natural hazard/man-made threat and mitigation project.

**Sources for mitigation funding are shown in Chapter 7.2, Mitigation Funding Sources.**

Current planning mechanisms, and the process for integration of the mitigation plan into planning mechanisms, are discussed after Table 7.1.4 and before Table 7.1.5. The process to integrate the mitigation plan into existing planning mechanisms for each jurisdiction is shown in the respective jurisdiction profile in Chapter 8, Jurisdictions following the mitigation capability assessment.

Information in the tables is outlined as follows:

1. Boxes checked with an “X” indicate the jurisdiction possesses the capability; while boxes left blank indicate the jurisdiction is lacking the capability.
2. An asterisk (\*) indicates a capability that can be obtained through the county, contracted services, or an outside entity.
3. A ^ denotes a mitigation capability in progress.

Narratives following each table detail the capabilities of Barnes County and incorporated jurisdictions are found in Chapter 7.1, Mitigation Capability Assessment. Information on the capabilities of each jurisdiction was gathered at committee meetings, and jurisdictional workshops, and interviews during the planning process. **Bolded narratives identify mitigation projects.**

Each identified resource in the four mitigation capability categories can be used to implement mitigation strategies and access funding for projects. A definition of each mitigation capability category is provided.

- **Administrative and Technical:** Identification of administrative and technical capabilities, which includes staff and their skills and tools for mitigation planning to implement specific mitigation actions.
- **Education and Outreach:** Identification of education and outreach programs, and methods already in place to implement mitigation activities and communicate hazard-related information.
- **Financial:** Identification of access to or eligibility to use funding resources for hazard mitigation for jurisdictions.
- **Planning and Regulatory:** Jurisdictional plans, policies, codes, and ordinances adopted and in place that prevent and reduce the impacts of hazards.

## 7. County/Jurisdiction Mitigation Capability Assessment

Capability for mitigation is divided into four categories: Administrative and Technical, Education and Outreach, Financial, and Planning and Regulatory. The following definitions are provided for each capability category based on information from the Federal Emergency Management Agency. Table 7.1 highlights administrative and technical capabilities, Table 7.2 highlights education and outreach capabilities, Table 7.3 highlights financial capabilities and Table 7.4 shows additional shows planning and regulatory capabilities of each incorporated jurisdiction, including Barnes County. Table 7.5 lists state and federal sources for mitigation.

Boxes checked with an “X” indicate the jurisdiction possesses the capability; while boxes left blank indicate the jurisdiction is lacking the capability. Narratives following each table detail the capabilities of Barnes County and incorporated jurisdictions. Information on the capabilities of each jurisdiction was gathered at jurisdictional meetings, committee meetings and interviews during the planning process.

Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. A definition of each mitigation capability category is provided.

**Administrative and Technical:** Identification of administrative and technical capabilities, which include: staff, their skills and tools for mitigation planning to implement specific mitigation actions.

**Education and Outreach:** Identification of education and outreach programs, and methods already in place to implement mitigation activities and communicate hazard-related information.

**Financial:** Identification of access to or eligibility to use funding resources for hazard mitigation for jurisdictions.

**Planning and Regulatory:** Jurisdictional plans, policies, codes, and ordinances adopted and in place that prevent and reduce the impacts of hazards.

Table 7.1 shows the administrative and technical capabilities of Barnes County and incorporated jurisdictions. The fire ISO rating for each jurisdiction is listed in the table and discussed in the following narratives. Boxes marked with an “X” indicates the jurisdiction has or has access to the administrative or technical capability for mitigation. An asterisk (\*) indicates a capability in progress.

Table 7.1 – Administrative and Technical Capabilities

Administrative and Technical Mitigation Capability	Barnes Co.	Dazy	Fingal	Kathryn	Leal	Litchville	Nome	Oriska	Pillsbury	Rogers	Sanborn	Sibley	Valley City	Wimbledon
Chief Building Official/Inspector													X	
City Council/Commission	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Civil Engineer			X										X	
Emergency Manager	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Emergency Services GIS Capable	X	X						X					X	X
Emergency Siren		X	X	X	X	X	X	X		X	X	X	X	X
Fire Index Sign						X					X	X	X	
Fire ISO Rating		9		8				9		10	6	9	4	8
Firewise Certification														
Floodplain Administrator/Mngr.	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Generator (portable or permanent)	X	X	X			X					X		X	X
Grant Writing Staff	X	X	X			X		X			X	X	X	X
Infrastructure Maintenance Prgms.	X		X		X		X		X			X	X	X
LEPC	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Mutual Aid Agreements	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Other Staff for Administration		X				X		X		X	X		X	
Planning Services	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Reporting of Data to Em. Mngr.	X	X	X	X	X	X	X	X		X	X	X	X	X
StormReady Certification														

\*Denotes communities that are in progress of purchasing and installing permanent generators.

**Barnes County:** Barnes County has an active county commission. The county does not have a chief building official or inspector. The county has a Local Emergency Planning Committee (LEPC). The county contracts with an engineering firm for civil engineering services. The Barnes County Emergency Manager is full-time and is also the floodplain administrator/manager. The county can contract with the South Central Dakota Regional Council (SCDRC), the regional planning council, or a private firm for planning services. The county road department maintains and repairs roads using chip-seal, and repairs and mows ditches on county roads. The county also is responsible for maintenance of all bridges located in the county, including bridges inside jurisdictional boundaries, and the Barnes County Water Resource District is responsible for river channel maintenance and clearing of debris to eliminate snagging. The weed board conducts annual tree trimming and elimination of weeds. For grant writing and administration capabilities, the county has the emergency manager, city-county health director, social services, NDSU/Barnes County Extension Service and employees at the Barnes County Courthouse. The county can also contract with SCDRC for grant writing and administration. The county has a county-wide mutual aid agreement for all emergency services. The county also has regional and state aid for emergency services. The county maintains Code Red, which serves as an automated hazard notification system for phones. The county does not own fire index signs and does not have a fire ISO rating. The county does not have any emergency sirens. The county has two portable generators at the sheriff’s department, but does not own permanent generators. The sign truck for the county road department and the truck for the county weed board have GPS for all vehicles. The Barnes County Sheriff’s Department provides law enforcement services. Fire protection is provided by local fire districts/departments.

Ambulance service is provided by Barnes County Ambulance. Law enforcement, fire districts/departments and ambulance services report hazard data to the emergency manager. The county does not have Firewise Certification. The county is not StormReady Certified.

**The city of Dazey:** The city of Dazey has an active city council. The city does not have a chief building official or inspector. The city has an LEPC through the county. The city does not have a civil engineer on staff, but does have the option to contract for engineering services when needed. The county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning, grant writing and grant administration services. The city conducts infrastructure maintenance on an as-needed basis. The city council has grant writing capability. The fire district/department staff have administration capabilities for mitigation. In addition to the county-wide mutual aid agreement, the city has mutual aid for emergency services with Rogers, Sanborn and Wimbledon, and Hannaford in neighboring Griggs County. The city has an emergency siren located on top of the community center, but it is not adequate as it is manually activated. The fire district/department has four portable generators for backup power, but does not have any permanent generators. The fire ISO rating is nine. The city does not have a fire index sign. The fire district/department does not have GIS capabilities, but staff have smart phones with location and mapping applications. The mayor and fire district/department chief reports hazard data to the emergency manager. The city does not have Firewise or StormReady Certification.

**The city of Fingal:** The city of Fingal has an active city council. The city does not have a chief building official or inspector. The city has an LEPC through the county. The city does not have a civil engineer on staff, but contracts with a private firm for infrastructure maintenance. The county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning, grant writing and grant administration services. The city maintains a contract with a sewer superintendent from Fargo to maintain the lift station on an annual basis. The city owns a mower and mows city property and vacant lots. The city charges \$50 per lot per mowing instance with charges placed on the water/sewer bill. The city auditor has grant writing capability. The city can also rely on the county emergency manager or the SCDRC for grant writing and administration. Mutual aid for emergency services is provided through the county-wide agreement. The city has an emergency siren located on the roof of the fire hall. The city has a portable generator for the lift station behind the community center. The portable generator is stored in the bus barn. The city does not have any permanent generators for backup power. The ISO rating for the city is unknown. The city does not have a fire index sign. Emergency services are not GIS capable. The fire chief reports hazard data to the emergency manager. It is unknown if the city is Firewise or StormReady Certified.

**The city of Kathryn:** The city of Kathryn has an active city council. The city does not have a chief building official or inspector. The city has an LEPC through the county. The city does not have a civil engineer on staff, but can contract for engineering services when needed. The county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city can contract with the SCDRC or another entity for planning, grant writing and grant administration services. The city does not have any infrastructure maintenance programs, but does conduct maintenance on an as-needed basis. Mutual aid agreements are signed with the cities of Fingal, Litchville and Nome, and Fort Ransom in neighboring Ransom County, and is also covered under the



county-wide mutual aid agreement. The city has an emergency siren located on top of the fire hall, but it is not adequate as it is manually activated. The city does not have a generator for backup power. The fire ISO rating for the city is eight. The city does not have a fire index sign. Emergency services are not GIS capable. However, the fire district/department does have radios connected to county dispatch for improved communication. The fire district/department chief reports hazard data to the emergency manager. The city does not have Firewise or StormReady Certification.

**The city of Leal:** The city of Leal has an active city council. The city does not have a chief building official or inspector. The city has an LEPC through the county. The city does not have a civil engineer on staff, but can contract for engineering services when needed. The county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning, grant writing and grant administration services as it does not have staff for those capabilities. The city conducts mowing on vacant lots and charges \$300 per year per lot. Other infrastructure maintenance is conducted on an as-needed basis. The city has a mutual aid agreement for emergency services through the county-wide agreement. The city has an emergency siren located on top of the fire hall, but it is not adequate as it is manually activated. The city does not have any generators. The fire ISO rating for the city is unknown. The city does not have a fire index sign. Emergency services are not GIS capable. The city council reports hazard data to the emergency manager. The city does not have Firewise or StormReady Certification.

**The city of Litchville:** The city of Litchville has an active city council. The city does not have a chief building official or inspector. The city has an LEPC through the county. The city does not have a civil engineer on staff, but can contract for engineering services when needed. The county emergency manager is the floodplain administrator/manager. The city auditor has grant writing and administrative capabilities. The city can also contract with the SCDRC or a private firm for planning, grant writing and grant administration services. The city does not have any infrastructure maintenance programs, but conducts maintenance on trees, vegetation and the sanitary sewer system on an as-needed basis. Mutual aid agreements are signed with the cities of Kathryn and Sanborn, and the cities of LaMoure and Marion in neighboring LaMoure County. The city is also part of the county-wide mutual aid agreement for emergency services. The city has an emergency siren located on top of the water tower. The city has two generators; one for the sanitary sewer lift station and the other for the water tower to keep water circulating to avoid freezing in winter months. The fire ISO rating for the city is unknown. The city has a fire index sign located at the corner of Main Street. Emergency services are not GIS capable. The city auditor reports hazard data to the emergency manager. The city is not Firewise or StormReady certified.

**The city of Nome:** The city of Nome has an active city council. The city does not have a chief building official or inspector. The city has an LEPC through the county. The city does not have a civil engineer but can contract with a private firm for civil engineering services. The county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city does not have staff for grant writing and administration purposes and relies on the emergency manager or the SCDRC for planning services, grant writing and grant administration. The city performs infrastructure maintenance on an as-needed basis, with the exception of mowing. The city owns mowing equipment and pays an hourly wage for mowing of city lots. The city also has a contract with the city of Enderlin in neighboring Ransom County for mosquito spraying through a grant. Mutual aid agreements are signed with the city of Enderlin for fire protection. The city is also part of the county-wide mutual aid

agreement for emergency services. The city has an emergency siren located on top of the fire hall, but it is not adequate as it is manually activated. The city does not have any generators. The fire ISO rating for the city is unknown. The city does not have a fire index sign. Emergency services are not GIS capable. The city council reports hazard data to the emergency manager. The city is not Firewise certified. The city does not have StormReady Certification.

**The city of Oriska:** The city of Oriska has an active city council. The city does not have a chief building official or inspector. The city participates in the County LEPC. The city does not have a civil engineer on staff, but can contract with a private firm for engineering services when needed. The county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning services, grant writing and grant administration services. However, the city council and auditor have experience in grant writing and administration. The mayor can also assist in administration. The city does not have any infrastructure maintenance programs, but conducts maintenance on an as-needed basis. The city is part of the county-wide mutual aid agreement for emergency services. The city has an emergency siren located on top of the fire hall, but it is not adequate as it is manually activated. The city does not have any generators. The fire ISO rating for the city is nine. The city does not have a fire index sign. Emergency services are not GIS capable. However, city staff have smart phones and assist emergency services when needed. The city auditor reports hazard data to the emergency manager. The city does not have Firewise or StormReady Certification.

**The city of Pillsbury:** The city of Pillsbury has an active city council. The city does not have a chief building official or inspector. The city has an LEPC through the county. The city does not have a civil engineer, but contracts when services are needed. The county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning, grant writing and grant administration services. The city conducts graveling of city streets every two-to-three years and mows city and vacant lots. The city is part of the county-wide mutual aid agreement for emergency services. The city, however, is part of the Hope Fire Department, which is headquartered in neighboring Steele County. The city does not have an emergency siren or generators. The fire ISO rating for the city is unknown. The city does not have a fire index sign. It is unknown if emergency services are GIS capable or if hazard data is reported to the emergency manager. It is unknown if the city is Firewise or StormReady Certified.

**The city of Rogers:** The city of Rogers has an active city council. The city does not have a chief building official or inspector. The city has an LEPC through the county. The city does not have a civil engineer, but can contract with a private firm when services are needed. The county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning, grant writing and grant administration services. However, the city council and auditor have administration capabilities. Infrastructure maintenance is conducted on an as-needed basis. The city is part of the county-wide mutual aid agreement for emergency services. The city also has signed mutual aid agreements specifically with Dazey, Sanborn, Valley City and Wimbledon for fire protection. The city has two emergency sirens with both located at the fire hall and one being manually activated and the other activated by county dispatch. The city does not have any generators. The fire ISO rating for the city is 10. The city does not have a fire index sign.

Emergency services are not GIS capable. The fire chief and assistant fire chief report hazard data to the emergency manager. The city is not Firewise or StormReady Certified.

**The city of Sanborn:** The city of Sanborn has an active city council. The city does not have a chief building official or inspector. The city has an LEPC through the county. The city does not have a civil engineer, but can contract with a private firm when services are needed. The county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning, grant writing and grant administration services. However, the county's emergency manager is a member of the city council and can write and administer grants. The city council and auditor also have administration capabilities. Infrastructure maintenance is conducted on an as-needed basis. The city is part of the county-wide mutual aid agreement for emergency services. The city has an emergency siren located at the fire hall. The city has a generator at the water tower. The fire ISO rating for the city is six. The city has a fire index sign located at the fire hall. Emergency services are not GIS capable. The fire chief and assistant fire chief report hazard data to the emergency manager. The city is not Firewise or StormReady Certified.

**The city of Sibley:** The city of Sibley has an active city council. The city does not have a chief building official or inspector. The city has an LEPC through the county. The city does not have a civil engineer, but can contract with a private firm when services are needed. The county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning, grant writing and grant administration services. However, the auditor, mayor and city council have grant writing capabilities as an arbor day grant was written by staff and awarded. The city conducts an annual clean up with additional infrastructure maintenance conducted on an as-needed basis. The city is part of the county-wide mutual aid agreement for emergency services. The city has an emergency siren located at the fire hall, but it is not adequate as it is manually activated. The city does not have any generators. The fire ISO rating for the city is nine. The city does not have a fire index sign. Emergency services are not GIS capable. The fire chief reports hazard data to the emergency manager. The city is not Firewise or StormReady Certified.

**The city of Valley City:** The city of Valley City has an active city council. The city has a full-time chief building official/inspector who also serves as the floodplain administrator/manager. The city is also FEMA flood mapped. The city has an LEPC through the county. The city has an ongoing contract with a local engineering firm for engineering and planning services. Emergency management is available through the county. The police chief, city administrator, independent city committees, city beautification committee and various city employees have grant writing and administration capabilities. The local economic development corporation has a full-time grant writer. The city can also contract with the SCDRC for planning, grant writing and grant administration services. For infrastructure maintenance, the city's public works and street departments routinely conduct the following activities: street sweeping, street repair, pot-hole repair, chip-seal and pavement marking maintenance. The public works department also is responsible for mowing of lots and ditches. The city's police department has been deputized by the Barnes County Sheriff's Department. The city contracts with the county emergency manager for services during flood emergencies and occurrences of hazards. The police chief is also certified in incident command system and can train other city staff on the system. The city is also part of the county-wide mutual aid agreement for emergency services. The city has six emergency sirens. The sirens are located at the following locations:

- 900 block of 5th Ave NW
- East of Jefferson Elementary on the 300 block of 12th St. NE near Charlie Brown Baseball Field
- West Main at LaFarge Dakota
- Valley City Public Works Shop
- West Main at the 1000 block
- Grainger Hill near the technology center on the 600 block of 6th St. SE

The city also possesses generators at the following locations:

- Six portable generators at the police station
- One permanent generator at the master lift station
- One permanent generator at the water treatment plant
- One permanent generator at the fire department
- One permanent generator at the police department

The fire ISO rating for the city is four. The city has two wildland fire index signs; one located on west main and the other on east main near the John Deere shop. The police department vehicles have laptops that are air-carded and have mapping capabilities, but do not have automatic vehicle locators installed. The fire department has vehicles and services that are GIS capable. The police chief, fire chief and city staff report hazard data to the emergency manager. The city is not Firewise or StormReady Certified.

**The city of Wimbledon:** The city of Wimbledon has an active city council. The city does not have a chief building official or inspector. The city has an LEPC through the county. The county emergency manager is the floodplain administrator/manager. The city is not flood mapped and the county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning, grant writing and grant administration services. However, the auditor and mayor have grant writing and administration capabilities. The city conducts mowing of city and vacant lots with the cost special assessed to the lot owner. All other infrastructure maintenance programs are done on an as-needed basis. The city is part of the county-wide mutual aid agreement for emergency services. The city has an emergency siren located at the community center. The city owns one portable generator, which is stored at Agroline. The fire ISO rating for the city is eight. The city does not have a fire index sign. The fire responder vehicle is GPS capable, but all other emergency service are not GIS capable. The first responders use smart phones and are working with neighboring Stutsman County to get usable maps on the phones. It is unknown if hazard data is reported to the emergency manager. The city is not Firewise or StormReady Certified.

Table 7.2 shows the education and outreach capabilities of Barnes County and incorporated jurisdictions. Boxes marked with an “X” indicates the jurisdiction has or has access to the education and outreach capability for mitigation.

**Table 7.2 – Education and Outreach Capabilities**

Education and Outreach Mitigation Capability	Barnes Co.	Dazey	Fingal	Kathryn	Leal	Litchville	Nome	Oriska	Pillsbury	Rogers	Sanborn	Sibley	Valley City	Wimbledon
County/City Events	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Entities Providing Public Education	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Non-Profit Organizations	X												X	
Other	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Public-Private Partnerships	X												X	
School Programs	X					X		X					X	
Website with Hazard Education	X												X	

**Barnes County:** The NDSU/Barnes County Extension Service, the Girl Scouts, the Boy Scouts, and the 4-H are organizations providing education and outreach on hazards. The county’s emergency management department maintains a website with hazard education information. The NDSU/Barnes County Extension Service, Central Valley Health District, and City-County Health provide public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. Eagle Creek Software Services and John Deere Seeding Group participate in the Community Emergency Response Teams (CERTS). The county’s emergency manager conducts education on shelter-in-place, response to sirens, 911 and general hazard education to students at public school and the general public, and provides brochures, pamphlets and other materials available at the Barnes County Courthouse.

**The city of Dazey:** The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. The city does not have any entities providing public education on hazards, but has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county’s emergency manager conducts education and outreach on hazards in the city.

**The city of Fingal:** The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. The city

does not have any entities providing public education on hazards, but has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. However, the all school reunion held in the city provides an opportunity for hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

**The city of Kathryn:** The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. The city does not have any entities providing public education on hazards, but has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

**The city of Leal:** The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. However, Barnes County North is located approximately three miles west of the city where education and outreach is provided to students. The city does not have any entities providing public education on hazard, but has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

**The city of Litchville:** The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. Fire prevention week is conducted at the elementary school on an annual basis. The Litchville Fire District and Department conducts education aside from fire prevention week at the elementary school when necessary. The city also has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

**The city of Nome:** The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. The city does not have any entities providing public education on hazards, but has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not have existing events where hazard education is conducted. However, the annual 4<sup>th</sup> of July community picnic and fire display provides an opportunity for hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

**The city of Oriska:** The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. Fire prevention week is conducted at the elementary school on an annual basis in October by the Oriska Fire Department. The city also has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

**The city of Pillsbury:** The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. The city does not have any entities providing public education on hazards, but has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

**The city of Rogers:** The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. Adam Benson-Quinn conducts hazard education, safety drills and precaution workshops for employees, but not the general public. The city also has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not

conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

**The city of Sanborn:** The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. Didiers Ag Center conducts hazard education for employees, but not the general public. The city also has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city also has an annual "smoker" event where hazard education is provided. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

**The city of Sibley:** The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. The Sodbusters, a monthly social club, provides education and outreach on hazards. The city also has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

**The city of Valley City:** The NDSU/Barnes County Extension Service and City-County Health are based in Valley City and provide education and outreach on hazards. The city maintains a website with hazard education. A website with hazard education is also available through the county. School programs on hazard education are conducted at the elementary schools, junior high/high school and Valley City State University by the county's emergency manager, police chief, fire chief and city officials. The Valley City Police Department Police Chief provides education on active shooter and shelter-in-place at Valley City State University on an annual basis. The Valley City Fire Department District Fire Chief conducts fire safety and prevention at schools on an annual basis. The city also has access to Central Valley Health District for public education on hazards. The annual winter show held in the city and the Barnes County Air Show held every two years at the Barnes County Municipal Airport located on the city's northwest side are events where outreach on hazard education is conducted. The city does not conduct any events specific to hazard education. There are no public-private partnerships providing education and outreach on hazards. However, the city has had discussions with John Deere Seeding Group, the largest employer in the city and Barnes County, to partner with the city to form a public-private partnership to conduct hazard education for employees and the general public. The county's emergency manager conducts education and outreach on hazards in the city at schools, businesses, and city meetings.



**The city of Wimbledon:** The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does maintain a website with hazard education. A website with hazard education is also available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. However, Barnes County North is located southeast of the city approximately eight miles where education and outreach is provided to students. Agroline and Cenex conducts hazard education for employees, but not the general public. The city also has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county’s emergency manager conducts education and outreach on hazards in the city.

Table 7.3 shows the financial capabilities of Barnes County and incorporated jurisdictions. Boxes marked with an “X” indicates the jurisdiction has or has access to the financial capability for mitigation.

**Table 7.3 – Financial Capabilities**

Financial Mitigation Capability	Barnes Co.	Dazey	Fingal	Kathryn	Leal	Litchville	Nome	Oriska	Pillsbury	Rogers	Sanborn	Sibley	Valley City	Wimbledon
Building Permits	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Capital Improvements Fund	X		X	X			X						X	
Community Development Block Grant (CDBG)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
General Obligation Bonds/Special Tax			X	X		X					X		X	
Other	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Private Entities				X						X				
Sanitary Sewer Fee		X	X	X		X	X				X	X	X	X
Special Assessments for New Development	X												X	
Storm water Utility Fee													X	

**Barnes County:** Barnes County sets aside tax revenue for capital improvements in a fund specifically for county roads and bridges and maintains a schedule of capital improvement projects. The county does not have storm water utility or sanitary sewer fees. The county does not levy special assessments for new development, but can do so if warranted. However, the Barnes County Water Resource District can levy special assessments for drainage improvements. The county may incur debt through general obligation bonds or special tax bonds but has not done so as of 2014. The county issues building permits. However, individual townships, if zoned, may require separate building permits. The county has access to Community Development Block Grants (CDBG) through the SCDRC. Between 1983 and 2012, CDBG funding was provided for 30 infrastructure projects in the county and 10 city jurisdictions. The Barnes County Rural Water District, Barnes County Water Resource District, townships, and county school districts are other sources of funding for mitigation. The townships may assess a fee or special

assessment for infrastructure maintenance such as mowing roadside ditches or maintaining roads. State and federal sources can and have provided funding for mitigation.

**The city of Dazey:** The city does not set aside tax revenue for capital improvements, but does maintain a savings account. The city does not have storm water utility fee as it lacks a storm water system. The city does special assess \$10 per month for maintenance of the sanitary sewer system. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also has the ability to do so if warranted. The city issues building permits through the county. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

**The city of Fingal:** The city maintains a general fund and sets aside additional revenue in a separate account specifically for sewer projects. The city does not have storm water utility fee as it lacks a storm water system. The city does special assess \$7.75 per month on the garage and sewer bill for maintenance of the sanitary sewer system. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city incurred debt through a bond from the state for a recent sewer project. The city can incur debt through general obligation bonds or special tax bonds in the future if needed. The city issues building permits. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

**The city of Kathryn:** The city maintains a capital improvements fund through a special assessment of \$10 on the water bill every month. The city does not have storm water utility fee as it lacks a storm water system. The city does special assess \$21.50 per month on the garage and sewer bill for maintenance of the sanitary sewer system. The city took out a bond from the Bank of North Dakota for a sewer project. The city issues building permits. The city has access to CDBG funds through the SCDRC. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation. The city also rents out a former school house located south of the city to Valley City State University for \$250 per month for the Prairie Waters Research Program. This revenue can also be used for mitigation if needed.

**The city of Leal:** The city maintains a general fund and not a separate account for capital improvements. The city does not have storm water utility fee as it lacks a storm water system. The city does not assess any sanitary sewer fees despite having a sanitary sewer system. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also has the ability to do so if warranted. The city issues building permits through the county. The city has access to CDBG funds through the SCDRC. The city does not have any private entities provide funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

**The city of Litchville:** The city maintains a general fund and not a separate account for capital improvements. The city does not assess a storm water utility fee despite having a storm water system. The city uses revenue from the general fund for storm water improvements. The city does special assess \$17 per month on the property tax bill for maintenance of the sanitary sewer system. The city took out a

loan for a new lagoon. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city issues building permits. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

**The city of Nome:** The city has a city improvement account and pays for infrastructure projects from the account. The account is refunded through general revenue. The city does not assess a storm water utility fee as it does not have a storm water system. The city charges a sanitary sewer fee of \$8, plus a \$4 special fee for updating the sanitary sewer system, which is placed on the water/sewer/garbage bill. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also has the ability to do so if warranted. The city issues building permits for free. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

**The city of Oriska:** The city has a general fund and savings account that can help pay for infrastructure projects, but does not maintain an account specifically for infrastructure projects. The city does not assess a storm water utility fee as it lacks a storm water system. The city does not charge a sanitary sewer fee despite having a sanitary sewer system. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also has the ability to do so if warranted. The city issues building permits for \$5. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

**The city of Pillsbury:** The city does not set aside tax revenue for capital improvements, but does maintain a savings account, which can be used if necessary. The city does not have storm water utility fee as it lacks a storm water system. The city special assesses \$10 per month for maintenance of the sanitary sewer system. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also has the ability to do so if warranted. The city issues building permits through the county. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

**The city of Rogers:** The city does not set aside tax revenue for capital improvements and only has a general fund. The city does not have storm water utility fee as it lacks a storm water system. The city does not charge a sanitary sewer fee despite having a sanitary sewer system. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also has the ability to do so if warranted. The city issues building permits. The city has access to CDBG funds through the SCDRC. The Adam Benson-Quinn elevator provides funding to the city when needed, which can potentially be used for mitigation purposes. The surrounding township and county school districts are other sources of funding for mitigation.

**The city of Sanborn:** The city does not set aside tax revenue for capital improvements and only has a general fund. The city does not have storm water utility fee as it lacks a storm water system. The city does charge a monthly sanitary sewer fee which is placed on the water/sewer/garbage bill. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city issued a bond to pay for a new pump house in recent years and has the ability to incur debt through general obligation bonds or special tax bonds in the future if needed. The city issues building permits. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

**The city of Sibley:** The city does not set aside tax revenue for capital improvements and only has a general fund. The city does not have storm water utility fee as it lacks a storm water system. The city charges a monthly sanitary sewer fee of \$50, which is placed on the water/sewer/garbage bill. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also has the ability to do so if warranted. The city issues building permits. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

**The city of Valley City:** The city sets aside revenues for capital improvements and maintains a separate fund. Revenues from the police department through citations and court actions help fund capital improvements. The city has a storm water utility fee of \$1 per month that is placed on resident's utility bill. The city also maintains a separate line item on the budget for storm water funding. The city also maintains a \$5 contingency plan on sanitary sewer repair and replacement. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city requires developers to fund and install infrastructure such as water/sewer, streets and sidewalks. The city incurs debt through general obligation bonds or special tax bonds for public works and roads. Roads are financed through a general obligation bond, which is paid back through property tax revenue from properties that are either adjacent to or have a direct benefit from the road project. The city issues building permits. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

**The city of Wimbledon:** The city does not set aside tax revenue for capital improvements and only has a general fund. The city does not have storm water utility fee as it lacks a storm water system. The city charges a monthly sanitary sewer fee of \$8, plus \$1.15 per thousand gallons of water on the water/sewer garbage bill. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also has the ability to do so if warranted. The city issues building permits. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

In addition to the aforementioned financial capabilities of the county and city jurisdictions, the following local, regional, state and federal entities can be used as funding sources for mitigation.

- Barnes County Rural Water District
- Barnes County Water Resource District
- Bek Communications
- Cable Service, Inc. (CSI)
- Dakota Central Telecommunications (Daktel)
- Dakota Rural Water District
- Dickey Rural Networks (DRN)
- Federal Emergency Management Agency
- Inter-Community Telephone Company
- N.D. Department of Emergency Services
- Mid-Continent Communications
- Montana-Dakota Utilities
- Otter Tail Power Company
- Qwest

Table 7.4 shows the planning and regulatory capabilities of Barnes County and incorporated jurisdictions. Boxes marked with an “X” indicates the jurisdiction has or has access to the planning and regulatory capability. An asterisk (\*) indicates a capability in progress.

**Table 7.4 – Planning and Regulatory Capabilities**

Planning and Regulatory Mitigation Capability	Barnes Co.	Dazey	Fingal	Kathryn	Leal	Litchville	Nome	Oriska	Pillsbury	Rogers	Sanborn	Sibley	Valley City	Wimbledon
Building Codes			X	X	X		X	X			X		X	
Building Permits	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Capital Improvements Plan	X												X	
Community Wildfire Protection Program Plan	X													
Comprehensive Plan													X	
Continuity of Operations Plan	X													
Drought Management Plan												X		
Evacuation and Shelter Plan	X													
FEMA Flood Map	X			X		X							X	
Flood Damage Reduction Study				X										
Flood Insurance Study	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Flood Management Plan	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Flood Ordinance	X							*					X	
Impact Fees													X	
Pandemic Influenza Response Plan	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inspector													X	
Land Use Plan	X												X	
Local Emergency Operations Plan	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Planning Commission	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Shelter and Mass Care Plan	X													
Strategic Plan													X	
Storm Water Management Plan	X	*											X	
Subdivision Ordinance	X												X	X
Transportation Plan	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Water Conservation Plan													X	
Zoning	X			X	X							X	X	X

\*Denotes communities that are in progress of implementing planning and regulatory mitigation capability.

**Barnes County:** Barnes County does not have a comprehensive, strategic, drought management or water conservation plan. The planning and zoning administration maintains a land use plan. The county road department has a capital improvements plan and maintains a schedule of projects. The county has a local emergency operations, but does not have a continuity of operations plan. The transportation plan is included in road department capital improvements plan. The county has a flood management plan, community wildfire protection program plan, evacuation and shelter plan, and a shelter and mass care plan administered by the county emergency manager. The flood management plan is also in the county’s emergency operations plan. The county highway department, townships or individual cities are responsible for their own plans. The county has zoning that is current as of 2012. The planning and

zoning administration acts as the planning commission. The county does not have building codes. The county does not have an inspector. The county is FEMA flood mapped as of 2007. The county does not have a flood damage reduction study, but does have a flood insurance study. The county has flood ordinances and subdivision ordinances which are administered through the planning and zoning administration. The county does not have impact fees. The county issues building permits for building and development. The county also requires permits for septic systems, which is a code requirement. The cost of building permits is set up on a graduated scale based on building valuation. Central Valley Health and City-County Health also have a Pandemic Influenza Response Plan identifying points of dispensing sites in the county.

**The city of Dazey:** The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. However, the city is in progress of developing a storm water management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning, subdivision ordinances or impact fees. The city issues building permits through the county. The city council serves as the planning commission for the city. The city has not adopted building codes and does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

**The city of Fingal:** The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning in place, but considers development on a case-by-case basis. The city does not have subdivision ordinances or impact fees, but does issue building permits. The city council serves as the planning commission for the city. The city adopted state building codes, but does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

**The city of Kathryn:** The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city has zoning in place. The city does not have subdivision ordinances or impact fees, but does issue building permits. The city council serves as the planning commission for the city. The city adopted state building codes 15 years ago, but does not have an inspector. The city is FEMA flood mapped but does not have flood ordinances. However, the city does have a flood damage reduction study from 1987 that can be used for mitigation. The city also have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

**The city of Leal:** The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's

local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning, but utilizes the county zoning for regulation of development. The city does not have subdivision ordinances or impact fees. The city issues building permits through the county. The city council serves as the planning commission for the city. The city adopted the county's building codes, but does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

**The city of Litchville:** The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning, subdivision ordinances or impact fees. The city issues its own building permits. The city council serves as the planning commission for the city. The city has no adopted building codes and does not have an inspector. The city is FEMA flood mapped but does not have flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

**The city of Nome:** The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning, subdivision ordinances or impact fees. The city issues its own building permits for free. The city council serves as the planning commission for the city. The city adopted the state building codes in 2005/2006, but does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

**The city of Oriska:** The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning, subdivision ordinances or impact fees. The city issues building permits. The city council serves as the planning commission for the city. The city adopted the state building codes, but does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. However, the city is considering flood ordinances to address overland flooding issues. The city is covered under the County's Pandemic Influenza Response Plan.

**The city of Pillsbury:** The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning, subdivision ordinances or impact fees. The city issues building permits through the county. The



city council serves as the planning commission for the city. The city does not have building codes and does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

**The city of Rogers:** The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning, subdivision ordinances or impact fees. The city issues building permits for \$5. The city council serves as the planning commission for the city. The city does not have building codes and does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

**The city of Sanborn:** The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city recently updated its zoning, but does not have subdivision ordinances or impact fees. The city issues building permits for \$5. The city council serves as the planning commission for the city. The city adopted state building codes but does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

**The city of Sibley:** The city does not have a comprehensive, strategic, capital improvements, land use, water conservation or storm water plan. The city does have a drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city has zoning in place dating back to the 1960s. The city is considering updating its zoning in 2015. The city does not have subdivision ordinances or impact fees. The city issues building permits for development. The city council serves as the planning commission for the city. The city has not adopted state building codes and does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

**The city of Valley City:** The city has a land use and transportation plan, which includes its comprehensive and strategic plans. The city maintains a capital improvements construction and forecast plan that plans projects 10 years in advance. The city works with the N.D. Department of Transportation on urban roads in Valley City to plan repair and maintenance, and areas needing replacement. The city has a draft of a local emergency operations plan prepared by the police department, which is scheduled for finalizing in late 2014/early 2015. The city has a flood management plan highlighting hierarchies inside each city department and the chain of command internally for each department. The public works department for the city has a water conservation plan consisting of a one-notification system for alerting residents when water rationing is in place. The storm water management plan for the city is operated

through public works. The current planning and zoning for existing and new structures requires all storm water to be retained on site and slowly released into the system. The city renews the storm water management plans and planning and zoning ordinances every time a road is either redone or built. The city does not have a continuity of operations or drought management plan. The city has zoning in place and has ordinances that specifically manage development of housing. The city has a planning and zoning commission, which is appointed by the city council, and reports directly to the city commission. The adopted state buildings codes 15 years ago and has a full-time building inspector. The city is FEMA flood mapped and has flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. The emergency flood plan also includes flood ordinances and is updated on an annual basis. The city issues permits for building and development. In place of impact fees, the city requires new developments to collect storm water and retain it on site. The city is covered under the County's Pandemic Influenza Response Plan.

**The city of Wimbledon:** The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city has zoning in place as of 2009. The city does not have impact fees but does have trailer park subdivision ordinances in place. The city issues building permits for development. The city council serves as the planning commission for the city. The city has not adopted state building codes and does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

In addition to the aforementioned planning and regulatory capabilities of the county and city jurisdictions, strategic plans for townships can be used for mitigation purposes. However, as of 2014, there are no townships in Barnes County with adopted strategic plans.

In addition to strategic plans, townships that have zoning in place, including a zoning commission and a zoning administrator, can use zoning for mitigation purposes. In Barnes County, all townships follow the county's zoning. As of 2014, there are no townships in Barnes County with zoning in addition to the county's zoning. However, Eckelson Township has been discussing implementing additional zoning to address industrial development in Spiritwood Township in neighboring Stutsman County to the west.

**Mitigation Funding Sources**

Table 7.5 lists state and federal sources for mitigation. These sources have been identified to fund and administer mitigation projects in addition to the aforementioned local capabilities of the county and city jurisdictions.

**Table 7.5 – State and Federal Mitigation Funding Sources**

Name	Managing Agencies
AmeriCorps	Corporation for National & Community Service
Community Development Block Grant (CDBG)	US Housing and Urban Development North Dakota Department of Commerce
Economic Development Administration (EDA) Grants and Investments	US Economic Development Administration
Emergency Watershed Protection	US Natural Resources Conservation Service
Environmental Quality Incentives Program	US Natural Resources Conservation Service
Flood Mitigation Assistance Program (FMA)	North Dakota State Water Commission and FEMA
Hazard Mitigation Grant Program (HMGP)	North Dakota Department of Emergency Services and FEMA
Hazardous Fuels Mitigation Program	North Dakota Department of Transportation
Homeland Security Grants	North Dakota Department of Emergency Services, US Department of Justice, US Department of Homeland Security
Individual Assistance (IA)	FEMA, North Dakota Department of Emergency Services
Map Modernization Program	North Dakota State Water Commission and FEMA
National Fire Plan (NFP)	North Dakota Forest Service and US Forest Service
NRCS Conservation Programs	U.S.D.A. Natural Resources Conservation Service
Pre-Disaster Mitigation (PDM) Grants	North Dakota Department of Emergency Services and FEMA
Public Assistance (PA)	North Dakota Department of Emergency Services and FEMA
Repetitive Flood Claims (RFC) Grant	North Dakota State Water Commission and FEMA
Rural Fire Assistance (RFA) Grant	National Interagency Fire Center
SBA Pre-Disaster Mitigation Loan Program	US Small Business Administration (SBA)
Severe Repetitive Loss (SRL) Grant	North Dakota State Water Commission and FEMA
Small Flood Control Projects	US Army Corps of Engineers (USACE)
Streambank & Shoreline Protection	US Army Corps of Engineers (USACE)
Wetland Program Development Grants (WPDGs)	US Environmental Protection Agency

## 7.2 Mitigation Funding Sources

Funding sources from mitigation can come from a variety of resources. The following funding sources for the Federal Emergency Management Agency (FEMA) and other outlets are outlined below. These sources can fund and administer mitigation projects in addition to the local capabilities of the county and city jurisdictions. In addition to the financial capabilities of Barnes County, the following local, regional, state and federal entities can be used to obtain funding for mitigation.

- Ambulance Districts;
- Electric Cooperatives;
- Extension Service;
- Federal Emergency Management Agency (FEMA);
- Fire Districts;
- N.D. Dept. of Public Health;
- N.D. Dept. of Emergency Services;
- Park Districts;
- School Districts;
- Townships, and
- Utility providers.

### **FEMA Funding Sources**

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

Applicants who are eligible for the HMGP are state and local governments, certain nonprofit organizations or institutions that perform essential government services, and Indian tribes and authorized tribal organizations. Individuals or homeowners cannot apply directly for the HMGP; a local government must apply on their behalf.

**Flood Mitigation Assistance (FMA) Program.** The FMA combines the previous Repetitive Flood Claims and Severe Repetitive Loss Grants into one grant program. FMA provides funding to assist states and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the NFIP. The FMA is funded annually; no federal disaster declaration is required. Only NFIP insured homes and businesses are eligible for mitigation in this program. Funding for FMA is very limited and, as with the HMGP, individuals cannot apply directly for the program. Applications must come from local governments or other eligible organizations. The federal cost share for an FMA project is 75 percent. At least 25 percent of the total eligible costs must be provided by a non-federal source. Of this 25 percent, no more than half

can be provided as in-kind contributions from third parties. At minimum, a FEMA-approved local flood mitigation plan is required before a project can be approved. FMA funds are distributed from FEMA to the state.

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

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

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

### **Other Mitigation Funding Sources**

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

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

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

assisting with community assessments, helping the community create an action plan, assisting with an annual Firewise Day, assisting with local wildfire mitigation projects, and communicating with the state liaison and the national program to ensure a smooth application process. Counties that previously used Title III funds for other wildfire preparation activities such as the Fire Safe Councils or similar would be able to carry out many of the same activities as they had before. However, with the new language, counties would be required to show that funds used for these activities were carried out under the Firewise Communities program. More information: <https://tinyurl.com/67dthhg>

**Community Planning Assistance for Wildfire.** Established in 2015 by Headwaters Economics and Wildfire Planning International, Community Planning Assistance for Wildfire (CPAW) works with communities to reduce wildfire risks through improved land use planning. CPAW is a grant-funded program providing communities with professional assistance from foresters, planners, economists and wildfire risk modelers to integrate wildfire mitigation into the development planning process. All services and recommendations are site-specific and come at no cost to the community. More information: <http://planningforwildfire.org/what-we-do/>

**Urban and Community Forestry (UCF) Program.** A cooperative program of the U.S. Forest Service that focuses on the stewardship of urban natural resources. With 80 percent of the nation's population in urban areas, there are strong environmental, social, and economic cases to be made for the conservation of green spaces to guide growth and revitalize city centers and older suburbs. UCF responds to the needs of urban areas by maintaining, restoring, and improving urban forest ecosystems on more than 70 million acres. Through these efforts the program encourages and promotes the creation of healthier, more livable urban environments across the nation. These grant programs are focused on issues and landscapes of national importance and prioritized through state and regional assessments. More information: <http://www.fs.fed.us/managing-land/urban-forests/ucf>

**Western Wildland Urban Interface Grants.** The National Fire Plan (NFP) is a long-term strategy for reducing the effects of catastrophic wildfires throughout the nation. The Division of Forestry's NFP Program is implemented within the Division's Fire and Aviation Program through the existing USDA Forest Service, State & Private Forestry, State Fire Assistance Program.

Congress has provided increased funding assistance to states through the U.S. Forest Service State and Private Forestry programs since 2001. The focus of much of this additional funding was mitigating risk in WUI areas. In the West, the State Fire Assistance funding is available and awarded through a competitive process with emphasis on hazard fuel reduction, information and education, and community and homeowner action. This portion of the National Fire Plan was developed to assist interface communities manage the unique hazards they find around them. Long-term solutions to interface challenges require informing and educating people who live in these areas about what they and their local organizations can do to mitigate these hazards.

The 10-Year Comprehensive Strategy focuses on assisting people and communities in the WUI to moderate the threat of catastrophic fire through the four broad goals of improving prevention and suppression, reducing hazardous fuels, restoring fire-adapted ecosystems, and promoting community assistance. The Western States Wildland Urban Interface Grant may be used to apply for financial assistance towards hazardous fuels and educational projects within the four goals of: improved prevention, reduction of hazardous fuels, restoration of fire-adapted ecosystems and promotion of community assistance. Information: <https://www.westernforesters.org/wui-grants>

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

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

**NOAA Office of Education Grants.** The Office of Education supports formal, informal and non-formal education projects and programs through competitively awarded grants and cooperative agreements to a variety of educational institutions and organizations in the United States. More information: <http://www.noaa.gov/office-education/grants>

**NRCS Environmental Quality Incentives Program (EQUIP).** The Environmental Quality Incentives Program, administered through the NRCS, is a cost-share program that provides financial and technical assistance to agricultural producers to plan and implement conservation practices that improve soil, water, plant, animal, air and related natural resources on agricultural land and non-industrial private forestland. Owners of land in agricultural or forest production or persons who are engaged in livestock, agricultural or forest production on eligible land and that have a natural resource concern on that land may apply to participate in EQUIP. Eligible land includes cropland, rangeland, pastureland, non-industrial private forestland and other farm or ranch lands. EQUIP is another funding mechanism for landowner fuel reduction projects. More information: <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/equip/>

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

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

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

**U.S. Department of Homeland Security.** Enhances the ability of states, local and tribal jurisdictions, and other regional authorities in the preparation, prevention, and response to terrorist attacks and other

disasters, by distributing grant funds. Localities can use grants for planning, equipment, training and exercise needs. These grants include but are not limited to areas of Critical Infrastructure Protection Equipment and Training for First Responders, and Homeland Security Grants. More information: <http://www.dhs.gov/>

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

**Building Blocks for Sustainable Communities.** The EPA Office of Sustainable Communities sometimes offers grants to support activities that improve the quality of development and protect human health and the environment. When these grants are offered, they will always be announced on [www.grants.gov](http://www.grants.gov).



### 8. Jurisdictions

This chapter serves as a mini “Plan Within the Plan” and includes the following information for each incorporated city jurisdiction in Barnes County:

- 1. Profile and Inventory**
  - Location
  - Population & Vulnerable Population
  - Housing Units and Household Size
  - Businesses
  - New and Future Development
- 2. Risk Assessment**
  - Score Summary
  - Hazard Scoring Notes
- 3. Mitigation Strategy**
  - Problem Statement
  - Mitigation Projects
- 4. Mitigation Capabilities**
  - Capability Definitions
- 5. Integration into Planning Mechanisms**
- 6. Plan Maintenance**

This information provides the basis for the risk assessment shown in each jurisdiction profile. Comparative statistics of each jurisdiction in Barnes County are shown in Chapter 4, Profile and Inventory.

The incorporated cities in Barnes County are shown alphabetically in the following chapter.

- 8.1: City of Dazey
- 8.2: City of Fingal
- 8.3: City of Kathryn
- 8.4: City of Leal
- 8.5: City of Litchville
- 8.6: City of Nome
- 8.7: City of Oriska
- 8.8: City of Pillsbury
- 8.9: City of Rogers
- 8.10: City of Sanborn
- 8.11: City of Sibley
- 8.12: City of Valley City
- 8.13: City of Wimbledon

## 8.1 City of Dazey, North Dakota

The following profile includes information specific to the city of Dazey for mitigation planning purposes. The information included is as follows:

- Profile and Inventory;
- Risk Assessment;
- Hazard Scoring Notes;
- Mitigation Projects, and
- Capabilities for Mitigation.

### **Integration into Planning Mechanisms**

The process for integration of the mitigation plan into existing planning mechanisms is discussed at the bottom of each mitigation project in section 8.1.3, in section 8.1.4, and in Chapter 6, Mitigation Strategy.

### **Plan Maintenance**

Plan maintenance is shown in section 8.1.6.

### **Critical Facilities and Infrastructure**

Figure 8.1.1 is a map of the city of Dazey provided by Barnes County Emergency Management.

Figure 8.1.1 – City of Dazey, North Dakota



Source(s): Barnes County Emergency Management

**8.1.1 Profile and Inventory**

The location, total population, vulnerable populations, housing units and household size, businesses, critical facilities and infrastructure, new and future development, services, jurisdictional buildings, emergency response services and utilities are shown for the city of Dazey. Detailed narratives follow each section heading to profile the city.

Detailed information on public buildings, services provided, emergency response services and utilities can be found can be found in Chapter 3, Profile and Inventory.

**Location**

The city of Dazey is located on N.D. Highway 1, approximately 30 miles north-northwest of Valley City in Barnes County.

**Population**

Table 8.1.1 shows population trends for the city of Dazey from 1920 to 2010, with an estimate for 2019.

Per the 2010 U.S. Decennial Census, the city of Dazey has a population of 104 people, which is an increase of 13 people (14.3 percent) from 91 people in 2000.

**Table 8.1.1 – 1920 to 2010 City of Dazey, North Dakota Population Statistics**

1920	1930	1940	1950	1960	1970	1980	1990	2000	2010	2019 (est.)
293	251	215	196	226	128	143	129	91	104	93

Source(s): U.S. Decennial Census; American Community Survey, 5-Year Estimates

**Vulnerable Populations**

Age. Per the 2015 to 2019 American Community Survey 5-Year Estimate, the population of the city of Dazey consists of eight individuals under the age of 20 and two individuals aged 65 and older.

Daycares. There is one daycare in the city of Dazey.

Poverty. Per the 2015 to 2019 American Community Survey 5-Year Estimate, there are seven households in the city of Dazey that live below the poverty line.

Public Schools. There is not a public school in the city of Dazey. Children living in the city of Dazey and surrounding area attend the Barnes County North.

Senior Housing Developments/Care Centers. There are no age-restricted, senior housing developments, or care centers in the city of Dazey.

**Housing Units and Household Size**

The 2015 to 2019 American Community Survey 5-Year Estimate shows there is a total of 42 housing units in the city consisting of 39 single-family homes, three mobile/RV homes, and no multifamily homes. However, according to the Mayor Dazey, the city has 33 single-family homes, 12 mobile/RV homes, and no multifamily homes.

The 2015 to 2019 American Community Survey 5-Year Estimate shows there are 29 households in the city of Dazey resulting in an average household size of 1.17 people. However, according to the Mayor Dazey, the city has 30 households.

### **Businesses**

There are no major employers in the city of Dazey. Additional information on businesses and economic development in the city of Dazey or can be obtained by contacting the Valley City-Barnes County Development Group.

### **New and Future Development**

The following development has occurred since the 2014 mitigation plan.

#### New

- The U.S. Post Office closed in 2019.
- Three single-family homes and multiple smaller out-buildings destroyed or removed since 2015.
- Several mobile homes have been moved since 2015.

#### Future

- The city is evaluating zoning of land for new residential housing development.
- Raising of road grade from city to N.D. Highway 1 to allow for reliable access for emergency services.
- The city is pursuing grant options to try and update the pumphouse controls.
- The city is working with the Barnes County Water District to reduce the level of Ten Mile to reduce flooding.

### **Buildings, Critical Facilities and Infrastructure, and Services and Utilities Provided**

The following section profiles the housing units, services, emergency response services, jurisdictional buildings, and utilities of the city of Dazey. Tables 3.10 to 3.13 in Chapter 3, Profile and Inventory show a complete inventory of this information for Barnes County and incorporated jurisdictions. An “X” indicates if the jurisdiction offers the utility or service (either through contract or employees) or possesses the building or resource. Narratives detailing information for the county and incorporated jurisdictions accompany each table.

Structures. Housing units show where populations are located. Table 3.9 in Chapter 3, Profile and Inventory shows the number of single-family, mobile home structures, and multifamily and in Barnes County and incorporated jurisdictions. The following are key points for the city of Dazey:

- There are 39 single-family housing units comprising 93.0 percent of all housing units in the city of Dazey.
- There are three Mobile/Boat/RV/Van homes comprising seven percent of all housing units in the city of Dazey.

- There are no Multifamily housing units in the city of Dazey.

Critical Facilities. The following facilities were identified as critical in the city of Dazey.

- Barnes County Highway Shop
- Dazey City Hall/Community Center
- Dazey Fire Hall

Infrastructure. The following infrastructure was identified as critical in the city of Dazey.

- The city of Dazey has a sanitary sewer with two lagoon cells and a lift station.
- The city maintains an underground water storage tank for drinking/potable water and fire suppression.
- The city of Dazey has an inert landfill.
- The city of Dazey is located on N.D. Highway 1.

Emergency Response Services. The following emergency response services were identified in the city of Dazey.

- Barnes County Ambulance provides ambulance services to the city of Dazey.
- The Dazey Rural Fire Department provides fire protection services to the city of Dazey and the Dazey Rural Fire Protection District provides fire protection services to surrounding rural areas.
- The Barnes County Sheriff's Office provides law enforcement services to the city of Dazey.
- The Dazey Quick Response Unit (QRU) has seven first responders and two EMT's.
- The nearest hospital is the Cooperstown Medical Center in the city of Cooperstown in neighboring Griggs County, but Barnes County Ambulance transports patients to CHI-Mercy Hospital in Valley City.
- City-County Health District is in the city of Valley City and provides public health services to the city of Dazey.

Services and Utilities. The following services are provided in the city of Dazey.

- Sanitation Specialists provides garbage collection services to the city of Dazey.
- The city of Dazey maintains an inert landfill.
- The city of Dazey has its own sanitary sewer system consisting of one lift station and two lagoon cells. There are no active septic systems in the city limits.
- The city has a storm water system consisting of bricks and mortar.
- The Valley City Times- Record is the official newspaper of the city of Dazey.
- Barnes Rural Water District provides drinking/potable water to the city of Dazey. However, the city maintains infrastructure supply drinking/potable water directly to city residents.
- Electricity is provided by Otter Tail Power.
- Natural gas is not available in the city of Dazey.
- Fuel oil and propane are used as an alternative heating source and is provided by companies chosen by the individual consumer.
- BEK provides internet, phone, and TV.

### 8.1.2 Risk Assessment and Hazard Scoring Notes

Table 8.1.2 summarizes the risk assessment scoring of the city of Dazey. The risk assessment and hazard scoring notes for each hazard specific to the city are shown in Table 8.1.3. Risk assessment notes for impact, frequency, likelihood and vulnerability ubiquitous for jurisdictions in Barnes County are found in Chapter 4, Threat and Hazard Identification Assessment in each respective hazard profile.

**Table 8.1.2 – City of Dazey Jurisdiction Risk Assessment Scoring Summary**

<b>Risk Assessment</b>							<b>Jurisdiction: City of Dazey</b>						
<b><u>Natural Hazard</u></b>	<b><u>Impact</u></b>	<b><u>Frequency</u></b>	<b><u>Likelihood</u></b>	<b><u>Vulnerability</u></b>	<b><u>Capabilities</u></b>	<b><u>Total</u></b>							
Drought	4	2	2	3	2	<b>9</b>							
Fire – Urban/Structure Collapse	3	2	2	3	2	<b>8</b>							
Fire – Wildland (Rural)	4	3	3	4	2	<b>12</b>							
Flood	4	4	4	4	2	<b>14</b>							
Geologic Hazard	NA	NA	NA	NA	NA	<b>NA</b>							
Infectious Disease	2	2	3	3	2	<b>8</b>							
Severe Summer Weather	3	2	3	3	2	<b>9</b>							
Severe Winter Weather	4	4	4	4	2	<b>14</b>							
Space Weather	4	1	2	4	2	<b>9</b>							
<b><u>Adversarial Threats</u></b>													
Civil Disturbance	4	1	2	3	1	<b>9</b>							
Criminal, Terrorist or Nation-State Attack	4	1	2	3	1	<b>9</b>							
Cyberattack	4	1	2	3	1	<b>9</b>							
<b><u>Technological Threats</u></b>													
Dam Failure	NA	NA	NA	NA	NA	<b>NA</b>							
Hazardous Material Release	4	2	3	3	1	<b>11</b>							
Transportation Incident	3	2	3	2	2	<b>8</b>							

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 8.1.3 – City of Dazey Jurisdiction Risk Assessment

	<b>Civil Disturbance</b>	
<b>Impact</b>	<ul style="list-style-type: none"> <li>Blocked Roads</li> <li>Business Interruptions</li> <li>Delayed Emergency Response</li> <li>Financial Hardship/Strain (public)</li> </ul>	<ul style="list-style-type: none"> <li>HAZMAT Release – oil trains and natural gas pipeline</li> <li>Human Injury/Death</li> <li>Property Damage (Structure)</li> <li>Property Damage (Vehicle)</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>Never an occurrence of a major incident</li> </ul>	<ul style="list-style-type: none"> <li>DAPL protesters were not active in the city</li> </ul>
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No railroad infrastructure or pipelines</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No railroad infrastructure or pipelines</li> </ul>



Table 8.1.3 – City of Dazey Jurisdiction Risk Assessment – Continued

Criminal, Terrorist, Nation-State Attack			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> <li>• Human Injury/Death</li> <li>• Property Damage (Structure)</li> <li>• Property Damage (Vehicle)</li> </ul> <ul style="list-style-type: none"> <li>• <b>Threats to city water supply</b></li> <li>• Mass Casualties/Fatalities</li> <li>• Loss of Communication Systems</li> <li>• Disease Outbreak/Mass Infections</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No occurrences</li> <li>• Miscellaneous property damage occurring in the city on an occasional basis</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No railroad infrastructure or pipelines</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No railroad infrastructure or pipelines</li> </ul>
<u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No railroad infrastructure or pipelines</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No railroad infrastructure or pipelines</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No railroad infrastructure or pipelines</li> </ul>
<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No railroad infrastructure or pipelines</li> </ul>		

Table 8.1.3 – City of Dazey Jurisdiction Risk Assessment – Continued

	Cyberattack	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> </ul>	<ul style="list-style-type: none"> <li>• Human Injury/Death</li> <li>• School Closure</li> <li>• <b>Loss of Communication Systems</b></li> <li>• Identity Theft – loss of wages and/or assets</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never an occurrence of a major attack</li> </ul>	
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>•</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No railroad infrastructure or pipelines</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Elderly population relying largely on landlines for communication purposes, remote medical care and equipment monitoring</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No railroad infrastructure or pipelines</li> </ul>

Table 8.1.3 – City of Dazey Jurisdiction Risk Assessment - Continued

		Drought	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Loss of Economy</li> <li>• Loss of Livestock</li> <li>• Loss of Wildlife Habitat (decreased wildlife populations)</li> <li>• Increase in Wildland Fire Potential</li> </ul>	<ul style="list-style-type: none"> <li>• Water quality compromised from stock dams</li> <li>• Diminished soil quality – salinity will increase</li> <li>• Negative impact on mental health of producers and fire responders – “community impact”</li> <li>• Local producers forced to sell off herds which can last for several years</li> <li>• Population loss as people moved away due to loss of economy</li> </ul>	
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Severe Drought of 1961/1962, 1988/1989 to 1991/1992</li> <li>• Summer of 2017, local producers forced to sell off portions of their herds</li> </ul>	<ul style="list-style-type: none"> <li>• End of July through winter of 2016 – county reached severe drought status</li> <li>• Severe drought in summer/fall of 2020</li> </ul>	
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Dry/wet cycle every five to eight years</li> <li>• Climatic patterns will result in an eventual drought of significance</li> <li>• Lack of precipitation</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Heavy precipitation</li> </ul>	
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Wildlife &amp; hunting economy</li> <li>• Agriculture economy</li> <li>• Elderly population</li> <li>• Flat terrain/open topography contributes to conditions</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• City does not have a fire index sign</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Financial assistance programs made available by the state and federal government</li> <li>• Burn Ban by county emergency management</li> <li>• Fire Index monitoring and mapping from NDDDES</li> <li>• Advanced communications such as internet and TV</li> <li>• 25,000-gallon underground storage tank</li> </ul>	

Table 8.1.3 – City of Dazey Jurisdiction Risk Assessment - Continued

Fire – Urban Fire/Structure Collapse			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• HAZMAT Release</li> </ul> <ul style="list-style-type: none"> <li>• Human Injury/Death</li> <li>• Increase Fire Potential</li> <li>• <b>Property damage on a significant scale if impacting downtown structures</b></li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Occurrences of structures/vehicles being impacted every five years</li> <li>• House on fire early 1990s</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Age of structures on main street</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> <li>• No railroad infrastructure</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Age of structures on main street</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> <li>• No railroad infrastructure</li> </ul>
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<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Age of structures</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• <b>Fire Hall does not have a permanent or portable generator</b></li> <li>• <b>Prolonged response times due to limited fire staff during the daytime</b></li> <li>• <b>Presence of abandoned properties</b></li> <li>• <b>Lack of building codes and enforcement</b></li> <li>• <b>Lack of street signage for emergency services</b></li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> <li>• No railroad infrastructure</li> <li>• 25,000-gallon underground storage tank for fire suppression</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Age of structures</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• <b>Fire Hall does not have a permanent or portable generator</b></li> <li>• <b>Prolonged response times due to limited fire staff during the daytime</b></li> <li>• <b>Presence of abandoned properties</b></li> <li>• <b>Lack of building codes and enforcement</b></li> <li>• <b>Lack of street signage for emergency services</b></li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> <li>• No railroad infrastructure</li> <li>• 25,000-gallon underground storage tank for fire suppression</li> </ul>
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Table 8.1.3 – City of Dazey Jurisdiction Risk Assessment – Continued

Fire – Rural & Wildland			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Crop Loss</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• Increase Fire Potential</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Mass Casualties</li> <li>• <b>Losses could be on a significant scale if impacting a major producer or farmstead</b></li> <li>• <b>Loss of farm equipment and assets</b></li> <li>• <b>Loss of Livestock</b></li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Significant fire once every five years</li> <li>• Approximately four wildland fires occurring annually</li> <li>• Controlled burns becoming out of control approximately 25 percent of the time</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> <li>• No railroad traversing city limits</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> <li>• No railroad traversing city limits</li> </ul>
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Table 8.1.3 – City of Dazey Jurisdiction Risk Assessment – Continued

Flood			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• <b>Blocked Roads:</b> access road to N.D. Highway 1</li> <li>• Delayed Emergency Response</li> <li>• Flooding (Highway &amp; Structure)</li> <li>• Human Injury/Death</li> <li>• Property Damage / Sewer Backup</li> <li>• <b>Runoff from buildings causes overland flooding</b></li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Bi-annual occurrences of localized flooding of nearby township roads and highways</li> <li>• <b>Annual overland flooding of city park</b></li> <li>• Flash flooding occurs from heavy precipitation</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Dry seasons and low precipitation</li> <li>• City performs storm water maintenance</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Dry seasons and low precipitation</li> <li>• City performs storm water maintenance</li> </ul>
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Table 8.1.3 – City of Dazey Jurisdiction Risk Assessment – Continued

Geologic Hazard			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Delayed Emergency Response</li> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> <li>• Loss of Power</li> <li>• Property Damage</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No incidents involving geologic hazards in or near city limits</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul>
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<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> <li>• Flat topography - no steep terrain where landslides could occur</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> <li>• Flat topography - no steep terrain where landslides could occur</li> </ul>
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Table 8.1.3 – City of Dazey Jurisdiction Risk Assessment – Continued

Hazardous Material Release			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Delayed Emergency Response / Increased Fire Potential</li> <li>• Environmental Degradation</li> <li>• Evacuation (localized)</li> <li>• Explosion</li> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> <li>• Loss of Potable Water</li> <li>• Loss of Power</li> <li>• Property Damage</li> <li>• Increased risk of HAZMAT release and/or transportation incidents due to increased oil train traffic and trucks</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Small incidents of leaking anhydrous tanks bi-annually</li> <li>• Never any major spills reported</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> <li>• No railroads or pipelines</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> <li>• No railroads or pipelines</li> </ul>
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<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy and related industries</li> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• <b>No hospital or medical clinic in city limits</b></li> <li>• <b>Manual-activated emergency siren</b></li> <li>• <b>Lack of street signage for emergency services</b></li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Fire departments have some HAZMAT training</li> <li>• <b>Manual-activated emergency siren</b></li> <li>• No railroads or pipelines</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy and related industries</li> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• <b>No hospital or medical clinic in city limits</b></li> <li>• <b>Manual-activated emergency siren</b></li> <li>• <b>Lack of street signage for emergency services</b></li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Fire departments have some HAZMAT training</li> <li>• <b>Manual-activated emergency siren</b></li> <li>• No railroads or pipelines</li> </ul>
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Table 8.1.3 – City of Dazey Jurisdiction Risk Assessment – Continued

	Infectious Disease	
Impact	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Human Injury/Death</li> <li>• Livestock Loss</li> <li>• Loss of Economy</li> <li>• Mass Casualties</li> </ul>	<ul style="list-style-type: none"> <li>• Strain on local medical resources (ambulance)</li> <li>• Loss of medical staff due to sickness</li> <li>• Loss of Potable Water</li> <li>• <b>Financial cost to public health resources</b></li> </ul>
Frequency	<ul style="list-style-type: none"> <li>• Annual occurrences of death, primarily among the elderly</li> <li>• Occurrence of disease - 1 in 3 for people annually</li> <li>• Annual occurrences of influenza cases in the local population</li> </ul>	<ul style="list-style-type: none"> <li>• <b>The COVID-19 Pandemic of 2020 resulted in mass quarantine and sheltering of the local population and temporary closure of businesses</b></li> </ul>
Likelihood	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• Dependent on weather for animals and crops</li> <li>• Presence of abandoned properties and overgrown lots</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> </ul>
Vulnerability	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• Presence of abandoned properties and overgrown lots</li> <li>• <b>No hospital or medica clinic</b></li> <li>• <b>No vet clinic in city limits</b></li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> <li>• Immunizations &amp; medications of local population</li> <li>• <b>No care center in the city</b></li> <li>• <b>No public school</b></li> </ul>

Table 8.1.3 – City of Dazey Jurisdiction Risk Assessment – Continued

Severe Summer Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• <b>Blocked Roads:</b> Access road to N.D. Highway 1</li> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – heat exhaustion</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> </ul> <ul style="list-style-type: none"> <li>• Vehicle Damage</li> <li>• Loss of Livestock</li> <li>• Loss of Crops</li> <li>• Loss of Power/Downed Power Lines -</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Property damage from tornados/straight-line winds in summer 2017 and 2019</li> <li>• Windstorms occurring annually</li> </ul> <ul style="list-style-type: none"> <li>• Annual occurrences of hailstorms</li> <li>• Two or three significant storms producing damage to trees and property annually</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• <b>Lack of permanent generator at pumphouse, lift station, community center, and fire hall</b></li> <li>• <b>Lack of building codes and enforcement</b></li> <li>• <b>Manual-activated emergency siren</b></li> <li>• <b>Lack of street signage for emergency services</b></li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• <b>Manual-activated emergency siren</b></li> <li>• <b>No public school</b></li> <li>• No railroad infrastructure</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• <b>Lack of permanent generator at pumphouse, lift station, community center, and fire hall</b></li> <li>• <b>Lack of building codes and enforcement</b></li> <li>• <b>Manual-activated emergency siren</b></li> <li>• <b>Lack of street signage for emergency services</b></li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• <b>Manual-activated emergency siren</b></li> <li>• <b>No public school</b></li> <li>• No railroad infrastructure</li> </ul>
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Table 8.1.3 – City of Dazey Jurisdiction Risk Assessment – Continued

Severe Winter Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – wind chill</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> <li>• Loss of Crops</li> <li>• Loss of Livestock</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> <li>• Vehicle Damage</li> <li>• <b>Infrastructure Degradation – frost heaving causing roads to buckle resulting in closure</b></li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• March 2017 snowstorm resulted in blocked roads throughout the city</li> <li>• Spring snowstorm of 2019</li> <li>• Annual occurrences of power loss from storms</li> <li>• Two or three significant blizzards producing damage to trees and property annually</li> <li>• In 1997, lost power for 3 days</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• <b>Lack of permanent generator at pumphouse, lift station, community center, and fire hall</b></li> <li>• <b>Lack of building codes and enforcement</b></li> <li>• <b>Manual-activated emergency siren</b></li> <li>• <b>Lack of street signage for emergency services</b></li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes</li> <li>• <b>Manual-activated emergency siren</b></li> <li>• <b>No public school</b></li> <li>• No railroad infrastructure</li> <li>• City has tractor with snow scoop</li> <li>• City has a snow blower</li> </ul> </td> </tr> </table>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• <b>Lack of permanent generator at pumphouse, lift station, community center, and fire hall</b></li> <li>• <b>Lack of building codes and enforcement</b></li> <li>• <b>Manual-activated emergency siren</b></li> <li>• <b>Lack of street signage for emergency services</b></li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes</li> <li>• <b>Manual-activated emergency siren</b></li> <li>• <b>No public school</b></li> <li>• No railroad infrastructure</li> <li>• City has tractor with snow scoop</li> <li>• City has a snow blower</li> </ul>
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Table 8.1.3 – City of Dazey Jurisdiction Risk Assessment – Continued

Space Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Loss of operation of the city hall, fire hall, lift station, etc.</li> <li>• Loss/outage of medical devices at private residences</li> <li>• Property damage from sewer backups due to loss of lift station</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never a recorded occurrence in Barnes County or North Dakota</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Dependent on solar activity and the 11-year solar cycle</li> <li>• Likely to occur once every 500 years per the 2018 N.D. Enhanced Mitigation MAOP</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> <li>• Lack of permanent generator at pumphouse, lift station, community center, and fire hall</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> <li>• Lack of permanent generator at pumphouse, lift station, community center, and fire hall</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> </ul>
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Table 8.1.3 – City of Dazey Jurisdiction Risk Assessment – Continued

Transportation Incident			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• <b>Blocked roads from inadequate road clearing</b></li> <li>• Human Injury/Death</li> <li>• Increased Fire Potential</li> <li>• Loss of Transportation/Accessibility</li> <li>• Mass Casualties/Fatalities</li> </ul> <ul style="list-style-type: none"> <li>• Delayed Emergency Response</li> <li>• HAZMAT Release</li> <li>• Livestock Loss</li> <li>• Business Interruptions</li> <li>• Property Damage</li> <li>• <b>Could be catastrophic if involving a school bus filled with children and a truck carrying hazardous materials</b></li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Annual occurrences of accidents involving cars and/or farm equipment</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Intoxicated drivers</li> <li>• <b>High truck traffic from agriculture-related traffic</b></li> <li>• Farmer has private landing strip</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• No commercial passenger airport</li> <li>• Decrease in oil trains (from a frequency of one per hour) one the DAPL opened in 2017</li> <li>• No railroad infrastructure</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Intoxicated drivers</li> <li>• <b>High truck traffic from agriculture-related traffic</b></li> <li>• Farmer has private landing strip</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• No commercial passenger airport</li> <li>• Decrease in oil trains (from a frequency of one per hour) one the DAPL opened in 2017</li> <li>• No railroad infrastructure</li> </ul>
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### 8.1.3 Mitigation Strategy

The Barnes County Multi-Jurisdictional Multi-Hazard Plan Update includes a mitigation strategy consisting of seven goals in Chapter 6. The following problem statement and mitigation projects address the mitigation needs of the city of Dazey. It should be noted that some mitigation projects that pertain to all jurisdictions are included to encourage county-wide collaboration.

#### **Problem Statement**

Located in a closed basin, the city of Dazey experiences overland flooding causing damage to property, critical facilities, and infrastructure. The city lacks generators at critical facilities and infrastructure and the emergency siren is manually activated. The city's pumphouse controls are failing, the walls of the sanitary lagoon are impacted from ground saturation, the storm sewer is undersized, and the fire hall is too small to accommodate modern trucks and equipment. The city has started a capital improvement plan and needs to complete it. With little to no capabilities, the city is dependent on outside sources for mitigation.

Engineering to upgrade/retrofit critical facilities and infrastructure, improved drainage, installation of generators at critical facilities and infrastructure, upgrading of the outdoor early warning system, and updating of planning and regulatory capabilities are a priority for the city.

**City of Dazey Project 1: Install permanent generators at critical facilities and infrastructure.**

Description/Benefit		Test existing generators and create regularly scheduled maintenance system. Install new generators to establish permanent source of backup power to maintain continued operation of the following critical facilities and infrastructure.					
		<u>Install New</u> <ul style="list-style-type: none"> <li>• Pumphouse</li> <li>• Lift station</li> <li>• Community center</li> <li>• Fire hall</li> </ul>					
Hazards Addressed		All hazards					
Affected Jurisdiction(s)		City of Dazey					
Project Status		Ongoing and Continue					
Priority		Very High					
Responsible Agency		City Council, Emergency Services, Public Works					
Partners		Emergency Management, Public Utilities					
Completion Timeframe		2 to 3 years			Cost	Project-specific	
Funding Source		Public Utilities, Regional Council, RD. FEMA Pre-Disaster Mitigation Grant Program (PDM). State Homeland Security grants.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>			<u>Plan Element Utilized</u>			<u>Process for Integration</u>	
Barnes County LEOP & Mitigation Plan Barnes County THIRA Dazey Capital Improvement Plan			Capability Assessment, Hazard History, Risk Assessment			Include in city and/or fire department's budget. Apply for grant funding or purchase directly using existing sales tax revenue or budgets. Approval city council or board.	

**City of Dazey Project 2: Upgrade manually-activated outdoor emergency siren.**

Description/Benefit	The city’s outdoor emergency siren is manually activated and needs to be upgraded to provide radio-activation/dispatch-activation.						
Hazards Addressed	All						
Affected Jurisdiction(s)	City of Dazey						
Project Status	Ongoing and Continue						
Priority	Very High						
Responsible Agency	City Council, Emergency Services						
Partners	County Commission, Emergency Management, NDAC, NDLC, Regional Council						
Completion Timeframe	2 to 3 years	Cost	Up to \$25,000 for a new siren				
Funding Source	Local budgets. N.D. League of Cities. State Homeland Security Grants. NDDDES.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Dazey Capital Improvement Plan		Capability Assessment, Hazard History, Risk Assessment			Include in city and/or fire department’s capital improvement plan. Apply for grant funding or purchase directly using existing sales tax revenue or budgets. Approval city council or board.		



**City of Dazey Project 3: Establish permanent drainage from the city park to the slough east of the city to eliminate occurrences of overland flooding.**

Description/Benefit		Reduction of damage to critical facilities and infrastructure from annual flooding to assure access for emergency services and continued operation of public infrastructure.					
Hazards Addressed		Flood, Infectious Disease, Severe Summer Weather, Severe Winter Weather					
Affected Jurisdiction(s)		City of Dazey					
Project Status		Ongoing and Continue					
Priority		High					
Responsible Agency		City Council, Public Works					
Partners		Water Resource District, DWR					
Completion Timeframe		2 to 3 years	Cost	Project-specific			
Funding Source		Local budgets. DWR.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	3	3	31
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Dazey Capital Improvement Plan		Capability Assessment, Hazard History, Risk Assessment			Work with water resource district and/or engineering firms to establish appropriate actions. Implement.		

**City of Dazey Project 4: Conduct engineering studies to upgrade and/or retrofit critical facilities and infrastructure.**

Description/Benefit	<p>The city’s pumphouse controls are failing and need to be updated. A failure would jeopardize the city’s drinking/potable water and fire suppression.</p> <p>The walls on the city’s sanitary lagoon are weakened from ground saturation and need to be retrofitted.</p> <p>The storm sewer that runs from city park to the slough east of the city needs to be upgraded. It is comprised of brick and mortar and has ground water infiltration.</p> <p>The city needs a new fire hall to accommodate larger trucks.</p>						
Hazard/Threat Addressed	Drought, Fire, Flood (overland), HAZMAT, Severe Summer Weather, Severe Winter Weather (All)						
Affected Jurisdiction(s)	City of Dazey						
Project Status	New						
Priority	High						
Responsible Agency	City Council, engineering firms, Public Works						
Partners	Emergency Management, Emergency Services, FEMA, NDDES, Public Health, engineering firms, private contractors, DWR						
Completion Timeframe	Ongoing	Cost	Project-specific				
Funding Source	FEMA’s Building Resilient Infrastructure and Communities (BRIC). Local budgets. NDDEQ. Prairie Dog Fund. DWR.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	2	3	5	2	4	26
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Commission studies through a formal bidding process. Select contractor. Apply for grant funding to execute or budget in local budgets.		

**City of Dazey Project 5: Update/expand existing and/or create new planning and regulatory capabilities to address existing and new development to strengthen local planning processes.**

Description/Benefit	The city of Dazey needs a capital improvement plan to strategize investments in critical facilities and infrastructure.  A list of plans, policies, codes and ordinances is shown in Chapter 7, Capability Assessment.						
Hazard/Threat Addressed	All						
Affected Jurisdiction(s)	City of Dazey						
Project Status	New						
Priority	Medium						
Responsible Agency	City Council						
Partners	Emergency Management, Emergency Services, NDDC, NDACo, NDLC, Public Works						
Completion Timeframe	Ongoing	Cost	\$0 to \$100,000 / Staff-time				
Funding Source	Local budgets. Local, state and federal grants. Private sector.						
<b>Values: 1 is low (negative impact and/or too costly) – Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	3	5	5	5	5	33
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
All		Capability Assessment, Hazard History, Risk Assessment			Develop, review, and approve by county commission and city councils.		

### 8.1.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: administrative and technical, education and outreach, financial, and planning and regulatory. Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. **Tables comparing the mitigation capabilities of the city of Dazey with all other jurisdictions in Barnes County can be found below and in Chapter 7, County Mitigation Capability Assessment.**

- Administrative and Technical: Identification of administrative and technical capabilities, which include staff, their skills and tools for mitigation planning to implement specific mitigation actions.
- Education and Outreach: Identification of education and outreach programs, and methods already in place to implement mitigation activities and communicate hazard-related information.
- Financial: Identification of access to or eligibility to use funding resources for hazard mitigation for jurisdictions.
- Planning and Regulatory: Jurisdictional plans, policies, codes, and ordinances adopted and in place that prevent and reduce the impacts of hazards.

#### City of Dazey Mitigation Capabilities

Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. Information on the capabilities of the city was gathered at its jurisdictional meeting, committee meetings, and interviews during the planning process.

#### Administrative and Technical

The following narrative details the administrative and technical capabilities of the city of Dazey.

The city of Dazey has an active city council. The city does not have a chief building official or inspector. The city has an LEPC through the county. The city does not have a civil engineer on staff but does have the option to contract for engineering services when needed. The county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning, grant writing and grant administration services. The city conducts infrastructure maintenance on an as-needed basis. The city council has grant writing capability. The fire district/department staff have administration capabilities for mitigation. In addition to the county-wide mutual aid agreement, the city has mutual aid for emergency services with Rogers, Sanborn and Wimbledon, and Hannaford in neighboring Griggs County. The city has an emergency siren located on top of the community center, but it is not adequate as it is manually activated. The fire district/department has four portable generators for backup power but does not have any permanent generators. The fire ISO rating is nine. The city does not have a fire index sign. The fire district/department does not have GIS capabilities, but staff have smart phones with location and mapping applications. The mayor and fire district/department chief reports hazard data to the emergency manager. The city does not have Firewise or StormReady Certification.

### **Education and Outreach**

The following narrative details the education and outreach capabilities of the city of Dazey.

The city does not have non-profit organizations providing education on hazards but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. The city does not have any entities providing public education on hazards but has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

### **Financial**

The following narrative details the financial capabilities of the city of Dazey.

The city does not set aside tax revenue for capital improvements but does maintain a savings account. The city does not have storm water utility fee as it lacks a storm water system. The city does special assess \$10 per month for maintenance of the sanitary sewer system. The city does not levy special assessments for new development but can do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also can do so if warranted. The city issues building permits through the county. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

### **Planning and Regulatory**

The following narrative details the planning and regulatory capabilities of the city of Dazey.

The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. However, the city is in progress of developing a storm water management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning, subdivision ordinances or impact fees. The city issues building permits through the county. The city council serves as the planning commission for the city. The city has not adopted building codes and does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

### **8.1.5 Integration of Mitigation Plan into Planning Mechanisms**

Integration of the plan into current planning mechanisms is critical in mitigation to communicate the needs of each jurisdiction to achieve an all-inclusive mitigation strategy. The process for integration of the mitigation plan is included after each mitigation project, which shows the planning mechanism utilized, the plan element used for integration and the process for integration.

### **8.1.6 Plan Maintenance**

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.

## 8.2 City of Fingal, North Dakota

The following profile includes information specific to the city of Fingal for mitigation planning purposes. The information included is as follows:

- Profile and Inventory;
- Risk Assessment;
- Hazard Scoring Notes;
- Mitigation Projects, and
- Capabilities for Mitigation.

### **Integration into Planning Mechanisms**

The process for integration of the mitigation plan into existing planning mechanisms is discussed at the bottom of each mitigation project in section 8.2.3, in section 8.2.4, and in Chapter 6, Mitigation Strategy.

### **Plan Maintenance**

Plan maintenance is shown in section 8.2.6.

### **Critical Facilities and Infrastructure**

Figure 8.2.1 is a map of the city of Fingal provided by Barnes County Emergency Management.

Figure 8.2.1 – City of Fingal, North Dakota



Source(s): Barnes County Emergency Management



### 8.2.1 Profile and Inventory

The location, total population, vulnerable populations, housing units and household size, businesses, critical facilities and infrastructure, new and future development, services, jurisdictional buildings, emergency response services and utilities are shown for the city of Fingal. Detailed narratives follow each section heading to profile the city.

Detailed information on public buildings, services provided, emergency response services and utilities can be found can be found in Chapter 3, Profile and Inventory.

#### Location

The city of Fingal is located on N.D. State Highway 32, approximately 22 miles south-southeast of Valley City in Barnes County.

#### Population

Table 8.2.1 shows population trends for the city of Fingal from 1920 to 2010, with an estimate for 2019.

Per the 2010 U.S. Decennial Census, the city of Fingal has a population of 197 people, which is a decrease of 36 people (27.1 percent) from 133 people in 2000.

**Table 8.2.1 – 1920 to 2010 City of Fingal, North Dakota Population Statistics**

1920	1930	1940	1950	1960	1970	1980	1990	2000	2010	2019 (est.)
--	324	300	210	190	166	151	138	133	97	86

Source(s): U.S. Decennial Census; American Community Survey, 5-Year Estimates

#### Vulnerable Populations

Age. Per the 2015 to 2019 American Community Survey 5-Year Estimate, the population of the city of Fingal consists of 20 individuals under the age of 20 and 13 individuals aged 65 and older.

Daycares. There are no daycares in the city of Fingal.

Poverty. Per the 2015 to 2019 American Community Survey 5-Year Estimate, there are 22 households in the city of Fingal that live below the poverty line.

Public Schools. There is not a public school in the city of Fingal. The school closed in 2000.

Senior Housing Developments/Care Centers. There are no age-restricted, senior housing developments, or care centers in the city of Fingal.

#### Housing Units and Household Size

The 2015 to 2019 American Community Survey 5-Year Estimate shows there is a total of 68 housing units in the city consisting of 63 single-family homes, five mobile/RV homes, and no multifamily homes.

The 2015 to 2019 American Community Survey 5-Year Estimate shows there are 58 households in the city of Fingal resulting in an average household size of 1.90 people.

### **Businesses**

There are no major employers in the city of Fingal. Additional information on businesses and economic development in the city of Fingal or can be obtained by contacting the Valley City-Barnes County Development Group.

### **New and Future Development**

New development is considered any development occurring since the 2015 Barnes County Multi-Hazard Mitigation Plan. Future development is considered any development that is planned, pending, or proposed. No new and future development was identified at the time of this plan update.

### **Buildings, Critical Facilities and Infrastructure, and Services and Utilities Provided**

The following section profiles the housing units, services, emergency response services, jurisdictional buildings, and utilities of the city of Fingal. Tables 3.10 to 3.13 in Chapter 3, Profile and Inventory show a complete inventory of this information for Barnes County and incorporated jurisdictions. An “X” indicates if the jurisdiction offers the utility or service (either through contract or employees) or possesses the building or resource. Narratives detailing information for the county and incorporated jurisdictions accompany each table.

Structures. Housing units show where populations are located. Table 3.9 in Chapter 3, Profile and Inventory shows the number of single-family, mobile home structures, and multifamily and in Barnes County and incorporated jurisdictions. The following are key points for the city of Fingal:

- There are 63 single-family housing units comprising 92.6 percent of all housing units in the city of Fingal.
- There are five Mobile/Boat/RV/Van homes comprising 7.4 percent of all housing units in the city of Fingal.
- There are no Multifamily housing units in the city of Fingal.

Critical Facilities. The following facilities were identified as critical in the city of Fingal.

- Fingal City Hall/Community Center
- Fingal City Shop
- Fingal Fire Hall
- Holy Trinity Catholic Church (serves as the official storm shelter)
- U.S. Post Office

Infrastructure. The following infrastructure was identified as critical in the city of Fingal.

- The city of Fingal has a sanitary sewer with two lagoon cells and a lift station.
- The city of Fingal does not have an inert landfill.
- The city of Fingal is adjacent to N.D. Highway 32.

Emergency Response Services. The following emergency response services were identified in the city of Fingal.

- Barnes County Ambulance provides ambulance services to the city of Fingal.
- The Fingal Volunteer Department provides fire protection services to the city of Fingal and surrounding rural areas.
- The Barnes County Sherriff's Office provides law enforcement services to the city of Fingal.
- The city has two first responders.
- The nearest hospital is CHI-Mercy Hospital in Valley City.
- City-County Health District is in the city of Valley City and provides public health services to the city of Fingal.

Services and Utilities. The following services are provided in the city of Fingal.

- Fat Man Garbage provides garbage collection services to the city of Fingal.
- The city of Fingal does not maintain an inert landfill.
- The city of Fingal has its own sanitary sewer system consisting of one lift station and two lagoon cells. There are no septic systems in the city limits.
- The city has a storm water system consisting of drainage ditches, culverts, and piping.
- The Valley City Times- Record is the official newspaper of the city of Fingal.
- Barnes Rural Water District provides drinking/potable water to the city of Fingal.
- Electricity is provided by Otter Tail Power.
- Natural gas is not available in the city of Fingal.
- Fuel oil, propane, and electricity are used as an alternative heating source and is provided by companies chosen by the individual consumer.
- BEK provides phone and internet.

## 8.2.2 Risk Assessment and Hazard Scoring Notes

Table 8.2.2 summarizes the risk assessment scoring of the city of Fingal. The risk assessment and hazard scoring notes for each hazard specific to the city are shown in Table 8.2.3. Risk assessment notes for impact, frequency, likelihood and vulnerability ubiquitous for jurisdictions in Barnes County are found in Chapter 4, Threat and Hazard Identification Assessment in each respective hazard profile.

**Table 8.2.2 – City of Fingal Jurisdiction Risk Assessment Scoring Summary**

<b>Risk Assessment</b>							<b>Jurisdiction: City of Fingal</b>					
<b><u>Natural Hazard</u></b>	<b><u>Impact</u></b>	<b><u>Frequency</u></b>	<b><u>Likelihood</u></b>	<b><u>Vulnerability</u></b>	<b><u>Capabilities</u></b>	<b><u>Total</u></b>						
Drought	4	3	3	3	1	<b>12</b>						
Fire – Urban/Structure Collapse	3	3	3	4	1	<b>12</b>						
Fire – Wildland (Rural)	3	3	3	3	1	<b>11</b>						
Flood	3	3	3	4	1	<b>12</b>						
Geologic Hazard	NA	NA	NA	NA	NA	<b>NA</b>						
Infectious Disease	2	2	2	4	1	<b>9</b>						
Severe Summer Weather	4	3	3	3	1	<b>12</b>						
Severe Winter Weather	4	4	4	4	1	<b>15</b>						
Space Weather	4	1	2	3	1	<b>9</b>						
<b><u>Adversarial Threats</u></b>												
Civil Disturbance	4	1	3	3	1	<b>11</b>						
Criminal, Terrorist or Nation-State Attack	4	1	3	3	1	<b>11</b>						
Cyberattack	4	1	2	3	1	<b>9</b>						
<b><u>Technological Threats</u></b>												
Dam Failure	NA	NA	NA	NA	NA	<b>NA</b>						
Hazardous Material Release	4	3	4	4	1	<b>14</b>						
Transportation Incident	4	3	4	4	1	<b>14</b>						

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 8.2.3 – City of Fingal Jurisdiction Risk Assessment

	<b>Civil Disturbance</b>	
<b>Impact</b>	<ul style="list-style-type: none"> <li>Blocked Roads</li> <li>Business Interruptions</li> <li>Delayed Emergency Response</li> <li>Financial Hardship/Strain (public)</li> </ul>	<ul style="list-style-type: none"> <li>HAZMAT Release – oil trains and natural gas pipeline</li> <li>Human Injury/Death</li> <li>Property Damage (Structure)</li> <li>Property Damage (Vehicle)</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>Never an occurrence of a major incident</li> </ul>	<ul style="list-style-type: none"> <li>DAPL protesters were not active in the city</li> </ul>
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> <li>Presence of railroad infrastructure</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No pipelines</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> <li>Presence of railroad infrastructure</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No pipelines</li> </ul>

Table 8.2.3 – City of Fingal Jurisdiction Risk Assessment – Continued

Criminal, Terrorist, Nation-State Attack			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> <li>• Human Injury/Death</li> <li>• Property Damage (Structure)</li> <li>• Property Damage (Vehicle)</li> </ul> <ul style="list-style-type: none"> <li>• <b>Threats to city water supply</b></li> <li>• Mass Casualties/Fatalities</li> <li>• Loss of Communication Systems</li> <li>• Disease Outbreak/Mass Infections</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No occurrences</li> <li>• Miscellaneous property damage occurring in the city on an occasional basis</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul> </td> <td style="width: 50%; border: none; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>
<u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul> </td> <td style="width: 50%; border: none; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>
<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>		

Table 8.2.3 – City of Fingal Jurisdiction Risk Assessment – Continued

Cyberattack			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> <li>• Human Injury/Death</li> <li>• School Closure</li> <li>• <b>Loss of Communication Systems</b></li> <li>• Identity Theft – loss of wages and/or assets</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never an occurrence of a major attack</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Presence of railroad infrastructure</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No pipelines</li> </ul>
<u>More Likely</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No pipelines</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Elderly population relying largely on landlines for communication purposes, remote medical care and equipment monitoring</li> <li>• Presence of railroad infrastructure</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Elderly population relying largely on landlines for communication purposes, remote medical care and equipment monitoring</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No pipelines</li> </ul>
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Table 8.2.3 – City of Fingal Jurisdiction Risk Assessment - Continued

	Drought	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Loss of Economy</li> <li>• Loss of Livestock</li> <li>• Loss of Wildlife Habitat (decreased wildlife populations)</li> <li>• Increase in Wildland Fire Potential</li> </ul>	<ul style="list-style-type: none"> <li>• Water quality compromised from stock dams</li> <li>• Diminished soil quality – salinity will increase</li> <li>• Negative impact on mental health of producers and fire responders – “community impact”</li> <li>• Local producers forced to sell off herds which can last for several years</li> <li>• Population loss as people moved away due to loss of economy</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Severe Drought of 1961/1962, 1988/1989 to 1991/1992</li> <li>• Summer of 2017, local producers forced to sell off portions of their herds</li> </ul>	<ul style="list-style-type: none"> <li>• End of July through winter of 2016 – county reached severe drought status</li> <li>• Severe drought in summer/fall of 2020</li> </ul>
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Dry/wet cycle every five to eight years</li> <li>• Climatic patterns will result in an eventual drought of significance</li> <li>• Lack of precipitation</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Heavy precipitation</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Wildlife &amp; hunting economy</li> <li>• Agriculture economy</li> <li>• Elderly population</li> <li>• Flat terrain/open topography contributes to conditions</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• City does not have a water tower</li> <li>• City does not have a fire index sign</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Financial assistance programs made available by the state and federal government</li> <li>• Burn Ban by county emergency management</li> <li>• Fire Index monitoring and mapping from NDDDES</li> <li>• Advanced communications such as internet and TV</li> </ul>



Table 8.2.3 – City of Fingal Jurisdiction Risk Assessment - Continued

Fire – Urban Fire/Structure Collapse	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• HAZMAT Release</li> </ul> <ul style="list-style-type: none"> <li>• Human Injury/Death</li> <li>• Increase Fire Potential</li> <li>• <b>Property damage on a significant scale if impacting downtown structures</b></li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Occurrences of structures/vehicles being impacted every five years</li> </ul> <ul style="list-style-type: none"> <li>• Dome/Trailer house burned down spring 2014</li> <li>• Single-family home abandoned experienced fire damage in 2007</li> </ul>
<b>Likelihood</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• <b>Railroad infrastructure traversing city limits</b></li> </ul> </div> <div style="width: 45%;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> </ul> </div> </div>
<b>Vulnerability</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Age of structures</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• <b>Prolonged response times due to limited fire staff during the daytime</b></li> <li>• <b>Railroad infrastructure traversing city limits</b></li> <li>• <b>Fire hydrants have low water pressure</b></li> </ul> </div> <div style="width: 45%;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> </ul> </div> </div>

Table 8.2.3 – City of Fingal Jurisdiction Risk Assessment – Continued

Fire – Rural & Wildland			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Crop Loss</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• Increase Fire Potential</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Mass Casualties</li> <li>• <b>Losses could be on a significant scale if impacting a major producer or farmstead</b></li> <li>• <b>Loss of farm equipment and assets</b></li> <li>• <b>Loss of Livestock</b></li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Farmers do controlled burning which can become out of control at times</li> <li>• No reports of lightning impacting</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> <li>• <b>Railroad infrastructure traversing through city limits</b></li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> <li>• <b>Railroad infrastructure traversing through city limits</b></li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> </ul>
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Table 8.2.3 – City of Fingal Jurisdiction Risk Assessment – Continued

	Flood	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• <b>Blocked Roads: 4<sup>th</sup> Ave due to improper drainage</b></li> <li>• Delayed Emergency Response</li> <li>• Flooding (Highway &amp; Structure)</li> <li>• Human Injury/Death</li> <li>• Property Damage / Sewer Backup</li> <li>• <b>Runoff from buildings causes overland flooding</b></li> </ul>	
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Bi-annual occurrences of localized flooding of nearby township roads and highways</li> </ul>	<ul style="list-style-type: none"> <li>• Flash flooding occurs from heavy precipitation</li> </ul>
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Dry seasons and low precipitation</li> <li>• City performs storm water drainage maintenance</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> <li>• City does not have flood ordinances</li> <li>• Ground seepage is inundating the city lagoon</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Alternate routes were identified for townships roads</li> <li>• City performs storm water drainage maintenance</li> </ul>

Table 8.2.3 – City of Fingal Jurisdiction Risk Assessment – Continued

	Geologic Hazard	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Delayed Emergency Response</li> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of Power</li> <li>• Property Damage</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No incidents involving geologic hazards in or near city limits</li> </ul>	
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul>

Table 8.2.3 – City of Fingal Jurisdiction Risk Assessment – Continued

Hazardous Material Release			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Delayed Emergency Response / Increased Fire Potential</li> <li>• Environmental Degradation</li> <li>• Evacuation (localized)</li> <li>• Explosion</li> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> <li>• Loss of Potable Water</li> <li>• Loss of Power</li> <li>• Property Damage</li> <li>• Increased risk of HAZMAT release and/or transportation incidents due to increased oil train traffic and trucks</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Small incidents of leaking anhydrous tanks bi-annually</li> <li>• Never any major spills reported</li> <li>• Never a pipeline leak</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines</li> <li>• <b>Railroad infrastructure traversing through city limits</b></li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> <li>• Zoning and building codes</li> <li>• Decrease in oil trains (from a frequency of one per hour) one the DAPL opened in 2017</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines</li> <li>• <b>Railroad infrastructure traversing through city limits</b></li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> <li>• Zoning and building codes</li> <li>• Decrease in oil trains (from a frequency of one per hour) one the DAPL opened in 2017</li> </ul>
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<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy and related industries</li> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines</li> <li>• <b>No hospital or medical clinic in city limits</b></li> <li>• <b>Manual-activated emergency siren</b></li> <li>• <b>Railroad infrastructure traversing through city limits</b></li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Designated truck route in the city of Fingal</li> <li>• Fire departments have some HAZMAT training</li> <li>• <b>Manual-activated emergency siren</b></li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy and related industries</li> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines</li> <li>• <b>No hospital or medical clinic in city limits</b></li> <li>• <b>Manual-activated emergency siren</b></li> <li>• <b>Railroad infrastructure traversing through city limits</b></li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Designated truck route in the city of Fingal</li> <li>• Fire departments have some HAZMAT training</li> <li>• <b>Manual-activated emergency siren</b></li> </ul>
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Table 8.2.3 – City of Fingal Jurisdiction Risk Assessment – Continued

	Infectious Disease	
Impact	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Human Injury/Death</li> <li>• Livestock Loss</li> <li>• Loss of Economy</li> <li>• Mass Casualties</li> </ul>	<ul style="list-style-type: none"> <li>• Strain on local medical resources (ambulance)</li> <li>• Loss of medical staff due to sickness</li> <li>• Loss of Potable Water</li> <li>• <b>Financial cost to public health resources</b></li> </ul>
Frequency	<ul style="list-style-type: none"> <li>• Annual occurrences of death, primarily among the elderly</li> <li>• Occurrence of disease - 1 in 3 for people annually</li> <li>• Annual occurrences of influenza cases in the local population</li> </ul>	<ul style="list-style-type: none"> <li>• <b>The COVID-19 Pandemic of 2020 resulted in mass quarantine and sheltering of the local population and temporary closure of businesses</b></li> </ul>
Likelihood	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• Dependent on weather for animals and crops</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> </ul>
Vulnerability	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• <b>No hospital or medical clinic</b></li> <li>• <b>No vet clinic in city limits</b></li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> <li>• Immunizations &amp; medications of local population</li> <li>• <b>No care center in the city</b></li> <li>• <b>No public school</b></li> </ul>

Table 8.2.3 – City of Fingal Jurisdiction Risk Assessment – Continued

Severe Summer Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• <b>Blocked Roads:</b> North entrance from N.D. Highway 32</li> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – heat exhaustion</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> <li>• Vehicle Damage</li> <li>• Loss of Livestock</li> <li>• Loss of Crops</li> <li>• Loss of Power/Downed Power Lines -</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Heavy rain from time to time during summer months</li> <li>• High winds and strong storms each summer season</li> <li>• Climate trends</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High winds cause the power outages which impacts the lift station</li> <li>• Ground seepage is inundating the city lagoon</li> <li>• Lack of building code enforcement</li> <li>• <b>Manual-activated emergency siren</b></li> <li>• <b>Lack of redundancy in power grid</b></li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• <b>Manual-activated emergency siren</b></li> <li>• <b>No public school</b></li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High winds cause the power outages which impacts the lift station</li> <li>• Ground seepage is inundating the city lagoon</li> <li>• Lack of building code enforcement</li> <li>• <b>Manual-activated emergency siren</b></li> <li>• <b>Lack of redundancy in power grid</b></li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• <b>Manual-activated emergency siren</b></li> <li>• <b>No public school</b></li> </ul>
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Table 8.2.3 – City of Fingal Jurisdiction Risk Assessment – Continued

Severe Winter Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• <b>Blocked Roads:</b> North entrance from N.D. Highway 32</li> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – wind chill</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> <li>• Loss of Crops</li> <li>• Loss of Livestock</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> <li>• Vehicle Damage</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Happens yearly, weather and climate in the area</li> <li>• High winds and ground blizzard conditions</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at city hall, fire hall and lift station</li> <li>• Lack of building code enforcement</li> <li>• <b>Manual-activated emergency siren</b></li> <li>• <b>Railroad infrastructure traversing through city limits</b></li> <li>• <b>Lack of redundancy in power grid</b></li> </ul> </td> <td style="width: 50%; border: none; vertical-align: top;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• <b>Manual-activated emergency siren</b></li> <li>• <b>No public school</b></li> <li>• Good city shop located in the city with snow blower, other equipment</li> </ul> </td> </tr> </table>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at city hall, fire hall and lift station</li> <li>• Lack of building code enforcement</li> <li>• <b>Manual-activated emergency siren</b></li> <li>• <b>Railroad infrastructure traversing through city limits</b></li> <li>• <b>Lack of redundancy in power grid</b></li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• <b>Manual-activated emergency siren</b></li> <li>• <b>No public school</b></li> <li>• Good city shop located in the city with snow blower, other equipment</li> </ul>
<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at city hall, fire hall and lift station</li> <li>• Lack of building code enforcement</li> <li>• <b>Manual-activated emergency siren</b></li> <li>• <b>Railroad infrastructure traversing through city limits</b></li> <li>• <b>Lack of redundancy in power grid</b></li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• <b>Manual-activated emergency siren</b></li> <li>• <b>No public school</b></li> <li>• Good city shop located in the city with snow blower, other equipment</li> </ul>		



Table 8.2.3 – City of Fingal Jurisdiction Risk Assessment – Continued

Space Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Loss of operation of the city hall, fire hall, lift station, etc.</li> <li>• Loss/outage of medical devices at private residences</li> <li>• Property damage from sewer backups due to loss of lift station</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never a recorded occurrence in Barnes County or North Dakota</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Dependent on solar activity and the 11-year solar cycle</li> <li>• Likely to occur once every 500 years per the 2018 N.D. Enhanced Mitigation MAOP</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> </ul>
<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> </ul>		

Table 8.2.3 – City of Fingal Jurisdiction Risk Assessment – Continued

Transportation Incident	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• <b>Blocked roads from inadequate road clearing</b></li> <li>• Human Injury/Death</li> <li>• Increased Fire Potential</li> <li>• Loss of Transportation/Accessibility</li> <li>• Mass Casualties/Fatalities</li> </ul> <ul style="list-style-type: none"> <li>• Delayed Emergency Response</li> <li>• HAZMAT Release</li> <li>• Livestock Loss</li> <li>• Business Interruptions</li> <li>• Property Damage</li> <li>• <b>Could be catastrophic if involving a school bus filled with children and a truck carrying hazardous materials</b></li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Annual occurrences of accidents involving cars and/or farm equipment</li> <li>• 10 years ago, heavy fog caused a motorist to hit a train on Highway 32</li> </ul>
<b>Likelihood</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Intoxicated drivers</li> <li>• <b>High truck traffic from agriculture-related traffic</b></li> <li>• <b>Railroad infrastructure traversing through city limits</b></li> <li>• </li> </ul> </div> <div style="width: 45%;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• No commercial passenger airport</li> <li>• Decrease in oil trains (from a frequency of one per hour) one the DAPL opened in 2017</li> </ul> </div> </div>
<b>Vulnerability</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Intoxicated drivers</li> <li>• <b>High truck traffic from agriculture-related traffic</b></li> <li>• <b>No hospital or medical clinic</b></li> <li>• <b>Railroad infrastructure traversing through city limits</b></li> </ul> </div> <div style="width: 45%;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• No commercial passenger airport</li> <li>• <b>Presence of designated truck routes through city limits</b></li> </ul> </div> </div>

### 8.2.3 Mitigation Strategy

The Barnes County Multi-Jurisdictional Multi-Hazard Plan Update includes a mitigation strategy consisting of seven goals in Chapter 6. The following problem statement and mitigation projects address the mitigation needs of the city of Fingal. It should be noted that some mitigation projects that pertain to all jurisdictions are included to encourage county-wide collaboration.

#### **Problem Statement**

The city of Fingal experiences overland flooding on city streets due to poor drainage. Changes in agriculture practices of surrounding farmland has increased runoff causing additional flooding issues in the city. Critical facilities and infrastructure are vulnerable to flooding and lack generators. The city's emergency siren is manually-activated. Transportation accidents are another issue as the city has seen an increase in truck and rail traffic. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Engineering to upgrade/retrofit critical facilities and infrastructure, improved drainage, installation of generators are critical facilities and infrastructure, and upgrading of the outdoor early warning system are a priority for the city.

**City of Fingal Project 1: Install permanent generators at critical facilities and infrastructure.**

Description/Benefit	Test existing generators and create regularly scheduled maintenance system. Install new generators to establish permanent source of backup power to maintain continued operation of the following critical facilities and infrastructure.  <u>Install New</u> <ul style="list-style-type: none"> <li>• Community center</li> <li>• Lift station</li> </ul>						
Hazards Addressed	All hazards						
Affected Jurisdiction(s)	City of Fingal						
Project Status	Ongoing and Continue						
Priority	Very High						
Responsible Agency	City Council, Emergency Services, Public Works,						
Partners	Emergency Management, Public Utilities						
Completion Timeframe	2 to 3 years	Cost	Project-specific				
Funding Source	Public Utilities, Regional Council, RD. FEMA Pre-Disaster Mitigation Grant Program (PDM). State Homeland Security grants.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	3	5	33
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Include in city and/or fire department's budget. Apply for grant funding or purchase directly using existing sales tax revenue or budgets. Approval city council or board.		

**City of Fingal Project 2: Upgrade manually-activated outdoor emergency siren.**

Description/Benefit		The city’s outdoor emergency siren is manually activated and needs to be upgraded to provide radio-activation/dispatch-activation.					
Hazards Addressed		All					
Affected Jurisdiction(s)		City of Fingal					
Project Status		New					
Priority		Very High					
Responsible Agency		City Council, Emergency Services					
Partners		County Commission, Emergency Management, NDAC, NDLC, Regional Council					
Completion Timeframe		2 to 3 years	Cost	Up to \$25,000 for a new siren			
Funding Source		Local budgets. N.D. League of Cities. State Homeland Security Grants. NDDDES.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Include in city and/or fire department’s capital improvement plan. Apply for grant funding or purchase directly using existing sales tax revenue or budgets. Approval city council or board.		

**City of Fingal Project 3: Create and implement drainage ditch maintenance system for drain at County Road 34 and 1<sup>st</sup> Avenue near railroad crossing.**

Description/Benefit		Maintain flow of runoff to eliminate standing water blocking roads to maintain access for city residents and emergency services and continued operation of public infrastructure. Control growth of vegetation to minimize fire hazard and spread of disease.					
Hazards Addressed		Flood, Infectious Disease, Severe Summer Weather, Severe Winter Weather					
Affected Jurisdiction(s)		City of Fingal					
Project Status		Ongoing and Continue					
Priority		Medium					
Responsible Agency		City Council, Public Works					
Partners		Water Resource District, DWR					
Completion Timeframe		2 to 3 years	Cost	Project-specific			
Funding Source		Local budgets.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	3	3	31
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Work with water board and/or engineering firms to establish appropriate actions. Implement.		

**City of Fingal Project 4: Conduct engineering studies to upgrade and/or retrofit critical facilities and infrastructure.**

Description/Benefit	Grade separate roads and highways from railroad crossings and/or install crossing arms.						
Hazard/Threat Addressed	Drought, Fire, Flood (overland), HAZMAT, Severe Summer Weather, Severe Winter Weather (All)						
Affected Jurisdiction(s)	City of Fingal						
Project Status	Ongoing and Continue						
Priority	High						
Responsible Agency	City Council, engineering firms, Public Works						
Partners	Emergency Management, Emergency Services, FEMA, NDDDES, engineering firms, private contractors						
Completion Timeframe	Ongoing	Cost	Project-specific				
Funding Source	FEMA’s Building Resilient Infrastructure and Communities (BRIC).						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	5	2	4	29
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Commission studies through a formal bidding process. Select contractor. Apply for grant funding to execute or budget in local budgets.		

## 8.2.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: administrative and technical, education and outreach, financial, and planning and regulatory. Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. **Tables comparing the mitigation capabilities of the city of Fingal with all other jurisdictions in Barnes County can be found below and in Chapter 7, County Mitigation Capability Assessment.**

- Administrative and Technical: Identification of administrative and technical capabilities, which include staff, their skills and tools for mitigation planning to implement specific mitigation actions.
- Education and Outreach: Identification of education and outreach programs, and methods already in place to implement mitigation activities and communicate hazard-related information.
- Financial: Identification of access to or eligibility to use funding resources for hazard mitigation for jurisdictions.
- Planning and Regulatory: Jurisdictional plans, policies, codes, and ordinances adopted and in place that prevent and reduce the impacts of hazards.

### City of Fingal Mitigation Capabilities

Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. Information on the capabilities of the city was gathered at its jurisdictional meeting, committee meetings, and interviews during the planning process.

#### Administrative and Technical

The following narrative details the administrative and technical capabilities of the city of Fingal.

The city of Fingal has an active city council. The city does not have a chief building official or inspector. The county LEPC serves the city. The city does not have a civil engineer on staff, but contracts with a private firm for infrastructure maintenance. The county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning, grant writing and grant administration services. The city maintains a contract with a sewer superintendent from Fargo to maintain the lift station on an annual basis. The city owns a mower and mows city property and vacant lots. The city charges \$50 per lot per mowing instance with charges placed on the water/sewer bill. The city auditor has grant writing capability. The city can also rely on the county emergency manager or the SCDRC for grant writing and administration. Mutual aid for emergency services is provided through the county-wide agreement. The city has an emergency siren located on the roof of the fire hall. The city has a portable generator for the lift station behind the community center. The portable generator is stored in the bus barn. The city does not have any permanent generators for backup power. The ISO rating for the city is unknown. The city does not have a fire index sign. Emergency services are not GIS capable. The fire chief reports hazard data to the emergency manager. It is unknown if the city is Firewise or StormReady Certified.



### **Education and Outreach**

The following narrative details the education and outreach capabilities of the city of Fingal.

The city does not have non-profit organizations providing education on hazards but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. The city does not have any entities providing public education on hazards but has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. However, all school reunion held in the city provides an opportunity for hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

### **Financial**

The following narrative details the financial capabilities of the city of Fingal.

The city maintains a general fund and sets aside additional revenue in a separate account specifically for sewer projects. The city does not have storm water utility fee as it lacks a storm water system. The city does special assess \$7.75 per month on the garbage and sewer bill for maintenance of the sanitary sewer system. The city does not levy special assessments for new development but can do so if warranted. The city incurred debt through a bond from the state for a recent sewer project. The city can incur debt through general obligation bonds or special tax bonds in the future if needed. The city issues building permits. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

### **Planning and Regulatory**

The following narrative details the planning and regulatory capabilities of the city of Fingal.

The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning in place but considers development on a case-by-case basis. The city does not have subdivision ordinances or impact fees but does issue building permits. The city council serves as the planning commission for the city. The city adopted state building codes but does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

### **8.2.5 Integration of Mitigation Plan into Planning Mechanisms**

Integration of the plan into current planning mechanisms is critical in mitigation to communicate the needs of each jurisdiction to achieve an all-inclusive mitigation strategy. The process for integration of the mitigation plan is included after each mitigation project, which shows the planning mechanism utilized, the plan element used for integration and the process for integration.

### **8.2.6 Plan Maintenance**

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.

### **8.3 City of Kathryn, North Dakota**

The following profile includes information specific to the city of Kathryn for mitigation planning purposes. The information included is as follows:

- Profile and Inventory;
- Risk Assessment;
- Hazard Scoring Notes;
- Mitigation Projects, and
- Capabilities for Mitigation.

#### **Integration into Planning Mechanisms**

The process for integration of the mitigation plan into existing planning mechanisms is discussed at the bottom of each mitigation project in section 8.3.3, in section 8.3.4, and in Chapter 6, Mitigation Strategy.

#### **Plan Maintenance**

Plan maintenance is shown in section 8.3.6.

#### **Critical Facilities and Infrastructure**

Figure 8.3.1 is a map of the city of Kathryn provided by Barnes County Emergency Management.

Figure 8.3.1 – City of Kathryn, North Dakota



Source(s): Barnes County Emergency Management

### 8.3.1 Profile and Inventory

The location, total population, vulnerable populations, housing units and household size, businesses, critical facilities and infrastructure, new and future development, services, jurisdictional buildings, emergency response services and utilities are shown for the city of Kathryn. Detailed narratives follow each section heading to profile the city.

Detailed information on public buildings, services provided, emergency response services and utilities can be found in Chapter 3, Profile and Inventory.

#### Location

The city of Kathryn is located on Barnes County Highway 21, approximately 18 miles south of Valley City in Barnes County.

#### Population

Table 8.3.1 shows population trends for the city of Kathryn from 1920 to 2010, with an estimate for 2019.

Per the 2010 U.S. Decennial Census, the city of Kathryn has a population of 52 people, which is a decrease of 11 people (17.5 percent) from 63 people in 2000.

**Table 8.3.1 – 1920 to 2010 City of Kathryn, North Dakota Population Statistics**

1920	1930	1940	1950	1960	1970	1980	1990	2000	2010	2019 (est.)
289	224	229	200	142	109	95	72	63	52	48

Source(s): U.S. Decennial Census; American Community Survey, 5-Year Estimates

#### Vulnerable Populations

Age. Per the 2015 to 2019 American Community Survey 5-Year Estimate, the population of the city of Kathryn consists of four individuals under the age of 20 and 11 individuals aged 65 and older.

Daycares. There are no daycares in the city of Kathryn.

Poverty. Per the 2015 to 2019 American Community Survey 5-Year Estimate, there is one household in the city of Kathryn that live below the poverty line.

Public Schools. There is not a public school in the city of Kathryn.

Senior Housing Developments/Care Centers. There are no age-restricted, senior housing developments, or care centers in the city of Kathryn.

#### Housing Units and Household Size

The 2015 to 2019 American Community Survey 5-Year Estimate shows there is a total of 32 housing units in the city consisting entirely of single-family homes.

The 2015 to 2019 American Community Survey 5-Year Estimate shows there are 25 households in the city of Kathryn resulting in an average household size of 1.84 people.

### **Businesses**

There are no major employers in the city of Kathryn. Additional information on businesses and economic development in the city of Kathryn or can be obtained by contacting the Valley City-Barnes County Development Group.

### **New and Future Development**

New development is considered any development occurring since the 2015 Barnes County Multi-Hazard Mitigation Plan. Future development is considered any development that is planned, pending, or proposed. No new and future development was identified at the time of this plan update.

### **Buildings, Critical Facilities and Infrastructure, and Services and Utilities Provided**

The following section profiles the housing units, services, emergency response services, jurisdictional buildings, and utilities of the city of Kathryn. Tables 3.10 to 3.13 in Chapter 3, Profile and Inventory show a complete inventory of this information for Barnes County and incorporated jurisdictions. An “X” indicates if the jurisdiction offers the utility or service (either through contract or employees) or possesses the building or resource. Narratives detailing information for the county and incorporated jurisdictions accompany each table.

Structures. Housing units show where populations are located. Table 3.9 in Chapter 3, Profile and Inventory shows the number of single-family, mobile home structures, and multifamily and in Barnes County and incorporated jurisdictions. The following are key points for the city of Kathryn:

- There are 63 single-family housing units comprising 100.0 percent of all housing units in the city of Kathryn.
- There are no Mobile/Boat/RV/Van homes or Multifamily housing units in the city of Kathryn.

Critical Facilities. The following facilities were identified as critical in the city of Kathryn.

- Barnes County Shop
- Kathryn City Hall/Community Center/City Shop
- Kathryn Fire Hall (also serves as a storm shelter)
- U.S. Post Office

Infrastructure. The following infrastructure was identified as critical in the city of Kathryn.

- The city of Kathryn has a sanitary sewer with two lagoon cells and a lift station.
- The city of Kathryn does not have an inert landfill.
- The city of Kathryn is located on Barnes County Highway 21

Emergency Response Services. The following emergency response services were identified in the city of Kathryn.

- Barnes County Ambulance provides ambulance services to the city of Kathryn.

- The Kathryn Fire Department provides fire protection services to the city of Kathryn. The Oak Hill Fire District provides Fire Protection to areas surrounding the city. Both fire protection services share the same fire hall.
- The Barnes County Sherriff's Office provides law enforcement services to the city of Kathryn.
- The city has one first responder.
- The nearest hospital is CHI-Mercy Hospital in Valley City.
- City-County Health District is in the city of Valley City and provides public health services to the city of Kathryn.

Services and Utilities. The following services are provided in the city of Kathryn.

- Fraedrich Transport provides garbage collection services to the city of Kathryn.
- The city of Kathryn does not maintain an inert landfill.
- The city of Kathryn has its own sanitary sewer system consisting of one lift station and two lagoon cells. There are no septic systems in the city limits. The lift station is located on the east side of the city on 2<sup>nd</sup> Avenue.
- The city has a storm water system consisting of drainage ditches, culverts, and piping.
- The Litchville Bulletin is the official newspaper of the city of Kathryn.
- Barnes Rural Water District provides drinking/potable water to the city of Kathryn. The city switched to rural water in 2015.
- Electricity is provided by Otter Tail Power.
- Natural gas is not available in the city of Kathryn.
- Fuel oil, propane, and electricity are used as an alternative heating source and is provided by companies chosen by the individual consumer.
- Dickey Rural Networks (DRN) provides phone and internet.

### 8.3.2 Risk Assessment and Hazard Scoring Notes

Table 8.3.2 summarizes the risk assessment scoring of the city of Kathryn. The risk assessment and hazard scoring notes for each hazard specific to the city are shown in Table 8.3.3. Risk assessment notes for impact, frequency, likelihood and vulnerability ubiquitous for jurisdictions in Barnes County are found in Chapter 4, Threat and Hazard Identification Assessment in each respective hazard profile.

**Table 8.3.2 – City of Kathryn Jurisdiction Risk Assessment Scoring Summary**

<b>Risk Assessment</b>							<b>Jurisdiction: City of Kathryn</b>						
<b><u>Natural Hazard</u></b>	<b><u>Impact</u></b>	<b><u>Frequency</u></b>	<b><u>Likelihood</u></b>	<b><u>Vulnerability</u></b>	<b><u>Capabilities</u></b>	<b><u>Total</u></b>							
Drought	3	3	3	3	2	<b>10</b>							
Fire – Urban/Structure Collapse	2	2	3	3	2	<b>8</b>							
Fire – Wildland (Rural)	2	2	2	3	2	<b>7</b>							
Flood	3	2	3	3	2	<b>9</b>							
Geologic Hazard	4	3	3	4	1	<b>13</b>							
Infectious Disease	2	2	2	3	2	<b>7</b>							
Severe Summer Weather	3	2	2	2	2	<b>7</b>							
Severe Winter Weather	3	3	3	2	2	<b>9</b>							
Space Weather	4	1	2	3	1	<b>9</b>							
<b><u>Adversarial Threats</u></b>													
Civil Disturbance	2	2	1	1	2	<b>4</b>							
Criminal, Terrorist or Nation-State Attack	2	2	1	1	2	<b>4</b>							
Cyberattack	4	1	2	3	1	<b>9</b>							
<b><u>Technological Threats</u></b>													
Dam Failure	4	3	3	3	1	<b>12</b>							
Hazardous Material Release	2	2	2	2	1	<b>7</b>							
Transportation Incident	1	2	2	2	1	<b>6</b>							

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)



Table 8.3.3 – City of Kathryn Jurisdiction Risk Assessment

	<b>Civil Disturbance</b>	
<b>Impact</b>	<ul style="list-style-type: none"> <li>Blocked Roads</li> <li>Business Interruptions</li> <li>Delayed Emergency Response</li> <li>Financial Hardship/Strain (public)</li> </ul>	<ul style="list-style-type: none"> <li>HAZMAT Release – oil trains and natural gas pipeline</li> <li>Human Injury/Death</li> <li>Property Damage (Structure)</li> <li>Property Damage (Vehicle)</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>Never an occurrence of a major incident</li> </ul>	<ul style="list-style-type: none"> <li>DAPL protesters were not active in the city</li> </ul>
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No railroad infrastructure or pipelines</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No railroad infrastructure or pipelines</li> </ul>

Table 8.3.3 – City of Kathryn Jurisdiction Risk Assessment – Continued

Criminal, Terrorist, Nation-State Attack			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> <li>• Human Injury/Death</li> <li>• Property Damage (Structure)</li> <li>• Property Damage (Vehicle)</li> </ul> <ul style="list-style-type: none"> <li>• <b>Threats to city water supply</b></li> <li>• Mass Casualties/Fatalities</li> <li>• Loss of Communication Systems</li> <li>• Disease Outbreak/Mass Infections</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No occurrences</li> <li>• Miscellaneous property damage occurring in the city on an occasional basis</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No railroad infrastructure or pipelines</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No railroad infrastructure or pipelines</li> </ul>
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<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No railroad infrastructure or pipelines</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No railroad infrastructure or pipelines</li> </ul>
<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No railroad infrastructure or pipelines</li> </ul>		

Table 8.3.3 – City of Kathryn Jurisdiction Risk Assessment – Continued

	Cyberattack	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> </ul>	<ul style="list-style-type: none"> <li>• Human Injury/Death</li> <li>• School Closure</li> <li>• Loss of Communication Systems</li> <li>• Identity Theft – loss of wages and/or assets</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never an occurrence of a major attack</li> </ul>	
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No railroad infrastructure or pipelines</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Elderly population relying largely on landlines for communication purposes, remote medical care and equipment monitoring</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No railroad infrastructure or pipelines</li> </ul>

Table 8.3.3 – City of Kathryn Jurisdiction Risk Assessment - Continued

Drought	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Loss of Economy</li> <li>• Loss of Livestock</li> <li>• Loss of Wildlife Habitat (decreased wildlife populations)</li> <li>• Increase in Wildland Fire Potential</li> </ul> <ul style="list-style-type: none"> <li>• Water quality compromised from stock dams</li> <li>• Diminished soil quality – salinity will increase</li> <li>• Negative impact on mental health of producers and fire responders – “community impact”</li> <li>• Local producers forced to sell off herds which can last for several years</li> <li>• Population loss as people moved away due to loss of economy</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Severe Drought of 1961/1962, 1988/1989 to 1991/1992</li> <li>• Summer of 2017, local producers forced to sell off portions of their herds</li> </ul> <ul style="list-style-type: none"> <li>• End of July through winter of 2016 – county reached severe drought status</li> <li>• Severe drought in summer/fall of 2020</li> </ul>
<b>Likelihood</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Dry/wet cycle every five to eight years</li> <li>• Climatic patterns will result in an eventual drought of significance</li> <li>• Lack of precipitation</li> </ul> </div> <div style="width: 45%;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Heavy precipitation</li> </ul> </div> </div>
<b>Vulnerability</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Wildlife &amp; hunting economy</li> <li>• Agriculture economy</li> <li>• Elderly population</li> <li>• Flat terrain/open topography contributes to conditions</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• City does not have a water tower</li> <li>• City does not have a fire index sign</li> </ul> </div> <div style="width: 45%;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Financial assistance programs made available by the state and federal government</li> <li>• Burn Ban by county emergency management</li> <li>• Fire Index monitoring and mapping from NDDDES</li> <li>• Advanced communications such as internet and TV</li> <li>• City has 28,000-gallon reservoir but has issues with leaking</li> </ul> </div> </div>

Table 8.3.3 – City of Kathryn Jurisdiction Risk Assessment - Continued

Fire – Urban Fire/Structure Collapse			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• HAZMAT Release</li> </ul> <ul style="list-style-type: none"> <li>• Human Injury/Death</li> <li>• Increase Fire Potential</li> <li>• Property damage on a significant scale if impacting downtown structures</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Occurrences of structures/vehicles being impacted every five years</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>•</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> <li>• No railroad infrastructure</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>•</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> <li>• No railroad infrastructure</li> </ul>
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Table 8.3.3 – City of Kathryn Jurisdiction Risk Assessment – Continued

Fire – Rural & Wildland			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Crop Loss</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• Increase Fire Potential</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Mass Casualties</li> <li>• Losses could be on a significant scale if impacting a major producer or farmstead</li> <li>• Loss of farm equipment and assets</li> <li>• Loss of Livestock</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Significant fire once every five years</li> <li>• Approximately four wildland fires occurring annually</li> <li>• Controlled burns becoming out of control approximately 25 percent of the time</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> <li>• No railroad infrastructure</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> <li>• No railroad infrastructure</li> </ul>
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Table 8.3.3 – City of Kathryn Jurisdiction Risk Assessment – Continued

Flood			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• <b><u>Blocked Roads:</u></b></li> <li>• Delayed Emergency Response</li> <li>• Flooding (Highway &amp; Structure)</li> <li>• Human Injury/Death</li> <li>• Property Damage / Sewer Backup</li> <li>• <b>Runoff from buildings causes overland flooding</b></li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Only happens when a lot of precipitation or snow in the winter</li> <li>• Depends largely on the weather</li> <li>• Sump pumps are constantly running</li> <li>• Flash flooding occurs from heavy precipitation</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Dry seasons and low precipitation</li> <li>• City performs storm water drainage maintenance</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Dry seasons and low precipitation</li> <li>• City performs storm water drainage maintenance</li> </ul>
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<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> <li>• City is not enrolled in the NFIP</li> <li>• City does not have flood ordinances</li> <li>• Creek levels are high in the spring and flows into the cracked sewer line and overflows the lift station</li> <li>• Lack of building code enforcement</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Adopted building codes</li> <li>• Alternate routes were identified for townships roads</li> <li>• City performs storm water drainage maintenance</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> <li>• City is not enrolled in the NFIP</li> <li>• City does not have flood ordinances</li> <li>• Creek levels are high in the spring and flows into the cracked sewer line and overflows the lift station</li> <li>• Lack of building code enforcement</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Adopted building codes</li> <li>• Alternate routes were identified for townships roads</li> <li>• City performs storm water drainage maintenance</li> </ul>
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Table 8.3.3 – City of Kathryn Jurisdiction Risk Assessment – Continued

Geologic Hazard			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Delayed Emergency Response</li> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> <li>• Loss of Power</li> <li>• Property Damage</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No incidents involving geologic hazards in or near city limits</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul>
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Table 8.3.3 – City of Kathryn Jurisdiction Risk Assessment – Continued

Hazardous Material Release			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Delayed Emergency Response / Increased Fire Potential</li> <li>• Environmental Degradation</li> <li>• Evacuation (localized)</li> <li>• Explosion</li> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> <li>• Loss of Potable Water</li> <li>• Loss of Power</li> <li>• Property Damage</li> <li>• Increased risk of HAZMAT release and/or transportation incidents due to increased oil train traffic and trucks</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Small incidents of leaking anhydrous tanks bi-annually</li> <li>• Never any major spills reported</li> <li>• Never a pipeline leak</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> <li>• No railroad infrastructure</li> <li>• Signs prohibit trucks from entering city limits-decreases likelihood</li> <li>• No anhydrous tanks – decreases likelihood, no chemicals at all</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> <li>• No railroad infrastructure</li> <li>• Signs prohibit trucks from entering city limits-decreases likelihood</li> <li>• No anhydrous tanks – decreases likelihood, no chemicals at all</li> </ul>
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Table 8.3.3 – City of Kathryn Jurisdiction Risk Assessment – Continued

Infectious Disease			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Human Injury/Death</li> <li>• Livestock Loss</li> <li>• Loss of Economy</li> <li>• Mass Casualties</li> <li>• Strain on local medical resources (ambulance)</li> <li>• Loss of medical staff due to sickness</li> <li>• Loss of Potable Water</li> <li>• Financial cost to public health resources</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Annual occurrences of death, primarily among the elderly</li> <li>• Occurrence of disease - 1 in 3 for people annually</li> <li>• Annual occurrences of influenza cases in the local population</li> <li>• The COVID-19 Pandemic of 2020 resulted in mass quarantine and sheltering of the local population and temporary closure of businesses</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• Dependent on weather for animals and crops</li> <li>• Transporting of animals across state lines</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• Dependent on weather for animals and crops</li> <li>• Transporting of animals across state lines</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> </ul>
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Table 8.3.3 – City of Kathryn Jurisdiction Risk Assessment – Continued

Severe Summer Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – heat exhaustion</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> <li>• Vehicle Damage</li> <li>• Loss of Livestock</li> <li>• Loss of Crops</li> <li>• Loss of Power/Downed Power Lines -</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Heavy rain from time to time during summer months</li> <li>• Couple high winds and strong storms per summer season</li> <li>• Annual occurrences of hailstorms</li> <li>• Two or three significant storms producing damage to trees and property annually</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Manual-activated emergency siren</li> <li>• Lack of permanent at lift station and fire hall</li> <li>• Lack of storm water drainage system</li> <li>• Lack of building code enforcement</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> <li>• Barnes County shop located in the city</li> <li>• Adopted building codes</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Manual-activated emergency siren</li> <li>• Lack of permanent at lift station and fire hall</li> <li>• Lack of storm water drainage system</li> <li>• Lack of building code enforcement</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> <li>• Barnes County shop located in the city</li> <li>• Adopted building codes</li> </ul>
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Table 8.3.3 – City of Kathryn Jurisdiction Risk Assessment – Continued

Severe Winter Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – wind chill</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> <li>• Loss of Crops</li> <li>• Loss of Livestock</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> <li>• Vehicle Damage</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Happens yearly, weather and climate in the area</li> <li>• High winds and ground blizzard conditions</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of building code enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Lack of permanent at lift station and fire hall</li> <li>• Lack of building code enforcement</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> <li>• Barnes County shop located in the city</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of building code enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Lack of permanent at lift station and fire hall</li> <li>• Lack of building code enforcement</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> <li>• Barnes County shop located in the city</li> </ul>
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Table 8.3.3 – City of Kathryn Jurisdiction Risk Assessment – Continued

Space Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Loss of operation of the city hall, fire hall, lift station, etc.</li> <li>• Loss/outage of medical devices at private residences</li> <li>• Property damage from sewer backups due to loss of lift station</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never a recorded occurrence in Barnes County or North Dakota</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Dependent on solar activity and the 11-year solar cycle</li> <li>• Likely to occur once every 500 years per the 2018 N.D. Enhanced Mitigation MAOP</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> <li>• Lack of generators at the fire hall and lift station</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> <li>• Lack of generators at the fire hall and lift station</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> </ul>
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Table 8.3.3 – City of Kathryn Jurisdiction Risk Assessment – Continued

	Transportation Incident	
Impact	<ul style="list-style-type: none"> <li>Blocked roads from inadequate road clearing</li> <li>Human Injury/Death</li> <li>Increased Fire Potential</li> <li>Loss of Transportation/Accessibility</li> <li>Mass Casualties/Fatalities</li> </ul>	<ul style="list-style-type: none"> <li>Delayed Emergency Response</li> <li>HAZMAT Release</li> <li>Livestock Loss</li> <li>Business Interruptions</li> <li>Property Damage</li> <li><b>Could be catastrophic if involving a school bus filled with children and a truck carrying hazardous materials</b></li> </ul>
Frequency	<ul style="list-style-type: none"> <li>Annual occurrences of accidents involving cars and/or farm equipment</li> </ul>	<ul style="list-style-type: none"> <li>Motorcycles accident on the highway on the 4<sup>th</sup> of July on gravel road south of town-2014</li> </ul>
Likelihood	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Intoxicated drivers</li> <li>High truck traffic from agriculture-related traffic</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>No commercial passenger airport</li> <li>Decrease in oil trains (from a frequency of one per hour) one the DAPL opened in 2017</li> <li>No railroad infrastructure</li> </ul>
Vulnerability	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Intoxicated drivers</li> <li>High truck traffic from agriculture-related traffic</li> <li>No hospital or medical clinic</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>No commercial passenger airport</li> <li>No railroad infrastructure</li> </ul>

### 8.3.3 Mitigation Strategy

The Barnes County Multi-Jurisdictional Multi-Hazard Plan Update includes a mitigation strategy consisting of seven goals in Chapter 6. The following problem statement and mitigation projects address the mitigation needs of the city of Kathryn. It should be noted that some mitigation projects that pertain to all jurisdictions are included to encourage county-wide collaboration.

#### **Problem Statement**

Located in proximity to Clausen Springs Dam, which experienced major erosion in 2009 and resulted in evacuation of the city, the city of Kathryn is vulnerable to a dam failure event. The Clausen Springs Dam and the Sheyenne River Valley National Scenic Byway attract recreation and temporary populations during summer months. The city is also located in a low point with respect to surrounding topography and is near the Sheyenne River, which contributes to overland flooding issues. The emergency siren on the fire hall is manually activated. The city of Kathryn's water supply is furnished by a spring-fed reservoir above the city and potable water is piped into the city. Two hazards threaten the city's water supply: geologic hazard, specifically landslide, and drought. The geologic hazard of landslide has caused the city of Kathryn to experience numerous water supply line breaks over the years. The sewer line from the lagoon to the city lift station was broke by a rural water contractor in 2015 and needs to be upgraded. The city had to rebuild the line which cost \$150,000 and the city took out a loan. In addition, the reduced amount of rainfall has reduced the amount of water flowing into the collection site threatening the availability of potable water. The city receives tax revenue from rental income on a former schoolhouse occupied by Valley City State University for research purposes. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Education and outreach, flood control measures, installation of new and upgrading of water infrastructure, installation of a generator for backup power, engineering studies for upgrading/retrofitting of critical facilities and infrastructure, and an upgraded emergency siren are a priority for the city.

**City of Kathryn Project 1: Install permanent generators at critical facilities and infrastructure.**

Description/Benefit	Test existing generators and create regularly scheduled maintenance system. Install new generators to establish permanent source of backup power to maintain continued operation of the following critical facilities and infrastructure.  <u>Install New</u> <ul style="list-style-type: none"> <li>• Kathryn Fire Hall</li> <li>• Lift station</li> </ul>						
Hazards Addressed	All hazards						
Affected Jurisdiction(s)	City of Kathryn						
Project Status	Ongoing and Continue						
Priority	Very High						
Responsible Agency	City Council, Emergency Services, Public Works						
Partners	Emergency Management, Public Utilities						
Completion Timeframe	2 to 3 years	Cost	Project-specific				
Funding Source	Public Utilities, Regional Council, RD. FEMA Pre-Disaster Mitigation Grant Program (PDM). State Homeland Security grants.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Include in city and/or fire department's budget. Apply for grant funding or purchase directly using existing sales tax revenue or budgets. Approval city council or board.		



**City of Kathryn Project 2: Upgrade manually-activated outdoor emergency siren.**

Description/Benefit		The city’s outdoor emergency siren is manually activated and needs to be upgraded to provide radio-activation/dispatch-activation.					
Hazards Addressed		All					
Affected Jurisdiction(s)		City of Kathryn					
Project Status		Ongoing and Continue					
Priority		Very High					
Responsible Agency		City Council, Emergency Services					
Partners		County Commission, Emergency Management, NDAC, NDLC, Regional Council					
Completion Timeframe		2 to 3 years	Cost	Up to \$25,000 for a new siren			
Funding Source		Local budgets. N.D. League of Cities. State Homeland Security Grants. NDDDES.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Include in city and/or fire department’s capital improvement plan. Apply for grant funding or purchase directly using existing sales tax revenue or budgets. Approval city council or board.		

**City of Kathryn Project 3: Create and implement maintenance system for Spring Creek.**

Description/Benefit	Maintain flow of runoff to eliminate standing water and flooding of people’s homes. To control growth of vegetation to minimize fire hazard, spread of disease, and impacts of severe weather.		
Hazards Addressed	Flood, Infectious Disease, Severe Summer Weather, Severe Winter Weather		
Affected Jurisdiction(s)	City of Kathryn		
Project Status	Ongoing and Continue		
Priority	High		
Responsible Agency	City Council, Public Works		
Partners	Emergency Management, Township Board, DWR		
Completion Timeframe	2 to 3 years	Cost	\$5,000+
Funding Source	Local budgets. State and federal grants. DWR.		

**Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)**

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	3	4	5	32

**Integration of Mitigation Plan Requirements into Local Planning Mechanisms**

<u>Planning Mechanisms Utilized</u>	<u>Plan Element</u>	<u>Process for Integration</u>
Barnes County LEOP & Mitigation Plan Barnes County THIRA	Capability Assessment, Hazard History, Risk Assessment	Meet with responsible agencies and partners to discuss what appropriate measures are needed. Develop plan. Adopt by city council and county water resource district.

**City of Kathryn Project 4: Conduct engineering studies to upgrade and/or retrofit critical facilities and infrastructure.**

Description/Benefit		<p>The lift station for the sanitary sewer system needs to be upgraded as the current lift station is nearing its end of useful life.</p> <p>The sewer line from the lagoon to the city lift station was broke by a rural water contractor in 2015 and needs to be upgraded. The city had to rebuild the line which cost \$150,000 and the city took out a loan. The city of Kathryn got sued for \$16,000 for a water easement by a local resident.</p> <p>The city lacks water storage and a delivery system for fire suppression. The existing fire hydrant system was abandoned in 2015 when rural water was connected to the city for drinking/potable water. An engineering study identifying options needs to be conducted.</p>					
Hazard/Threat Addressed		Drought, Fire, Flood (overland), HAZMAT, Severe Summer Weather, Severe Winter Weather (All)					
Affected Jurisdiction(s)		City of Kathryn					
Project Status		New/Ongoing and Continue					
Priority		High					
Responsible Agency		City Council, engineering firms, Public Works					
Partners		Emergency Management, Emergency Services, FEMA, NDDES, engineering firms, private contractors, SWC					
Completion Timeframe		Ongoing	Cost	Project-specific			
Funding Source		FEMA’s Building Resilient Infrastructure and Communities (BRIC). Local budgets. NDDEQ. Prairie Dog Fund.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	2	3	5	2	4	26
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Commission studies through a formal bidding process. Select contractor. Apply for grant funding to execute or budget in local budgets.		

### 8.3.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: administrative and technical, education and outreach, financial, and planning and regulatory. Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. **Tables comparing the mitigation capabilities of the city of Kathryn with all other jurisdictions in Barnes County can be found below and in Chapter 7, County Mitigation Capability Assessment.**

- Administrative and Technical: Identification of administrative and technical capabilities, which include staff, their skills and tools for mitigation planning to implement specific mitigation actions.
- Education and Outreach: Identification of education and outreach programs, and methods already in place to implement mitigation activities and communicate hazard-related information.
- Financial: Identification of access to or eligibility to use funding resources for hazard mitigation for jurisdictions.
- Planning and Regulatory: Jurisdictional plans, policies, codes, and ordinances adopted and in place that prevent and reduce the impacts of hazards.

#### City of Kathryn Mitigation Capabilities

Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. Information on the capabilities of the city was gathered at its jurisdictional meeting, committee meetings, and interviews during the planning process.

#### Administrative and Technical

The following narrative details the administrative and technical capabilities of the city of Kathryn.

The city of Kathryn has an active city council. The city does not have a chief building official or inspector. The county LEPC serves the city. The city does not have a civil engineer on staff but can contract for engineering services when needed. The county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city can contract with the SCDRC or another entity for planning, grant writing and grant administration services. The city does not have any infrastructure maintenance programs but does conduct maintenance on an as-needed basis. Mutual aid agreements are signed with the cities of Fingal, Litchville, Nome, and Fort Ransom in neighboring Ransom County, and is also covered under the county-wide mutual aid agreement. The city has an emergency siren located on top of the fire hall, but it is not adequate as it is manually activated. The city does not have a generator for backup power. The fire ISO rating for the city is eight. The city does not have a fire index sign. Emergency services are not GIS capable. However, the fire district/department does have radios connected to county dispatch for improved communication. The fire district/department chief reports hazard data to the emergency manager. The city does not have Firewise or StormReady Certification.

### **Education and Outreach**

The following narrative details the education and outreach capabilities of the city of Kathryn.

The city does not have non-profit organizations providing education on hazards but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. The city does not have any entities providing public education on hazards but has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

### **Financial**

The following narrative details the financial capabilities of the city of Kathryn.

The city maintains a capital improvements fund through a special assessment of \$10 on the water bill every month. The city does not have storm water utility fee as it lacks a storm water system. The city does special assess \$21.50 per month on the garbage and sewer bill for maintenance of the sanitary sewer system. The city took out a bond from the Bank of North Dakota for a sewer project. The city issues building permits. The city has access to CDBG funds through the SCDRC. The city does not levy special assessments for new development but can do so if warranted. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation. The city also rents out a former schoolhouse located south of the city to Valley City State University for \$250 per month for the Prairie Waters Research Program. This revenue can also be used for mitigation if needed.

### **Planning and Regulatory**

The following narrative details the planning and regulatory capabilities of the city of Kathryn.

The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city has zoning in place. The city does not have subdivision ordinances or impact fees but does issue building permits. The city council serves as the planning commission for the city. The city adopted state building codes 15 years ago but does not have an inspector. The city is FEMA flood mapped but does not have flood ordinances. However, the city does have a flood damage reduction study from 1987 that can be used for mitigation. The city also have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

### **8.3.5 Integration of Mitigation Plan into Planning Mechanisms**

Integration of the plan into current planning mechanisms is critical in mitigation to communicate the needs of each jurisdiction to achieve an all-inclusive mitigation strategy. The process for integration of the mitigation plan is included after each mitigation project, which shows the planning mechanism utilized, the plan element used for integration and the process for integration.

### **8.3.6 Plan Maintenance**

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.

## 8.4 City of Leal, North Dakota

The following profile includes information specific to the city of Leal for mitigation planning purposes. The information included is as follows:

- Profile and Inventory;
- Risk Assessment;
- Hazard Scoring Notes;
- Mitigation Projects, and
- Capabilities for Mitigation.

### **Integration into Planning Mechanisms**

The process for integration of the mitigation plan into existing planning mechanisms is discussed at the bottom of each mitigation project in section 8.4.3, in section 8.4.4, and in Chapter 6, Mitigation Strategy.

### **Plan Maintenance**

Plan maintenance is shown in section 8.4.6.

### **Critical Facilities and Infrastructure**

Figure 8.4.1 is a map of the city of Leal provided by Barnes County Emergency Management.

Figure 8.4.1 – City of Leal, North Dakota



Source(s): Barnes County Emergency Management



### 8.4.1 Profile and Inventory

The location, total population, vulnerable populations, housing units and household size, businesses, critical facilities and infrastructure, new and future development, services, jurisdictional buildings, emergency response services and utilities are shown for the city of Leal. Detailed narratives follow each section heading to profile the city.

Detailed information on public buildings, services provided, emergency response services and utilities can be found in Chapter 3, Profile and Inventory.

#### Location

The city of Leal is located on N.D. Highway 9, approximately 30 miles northwest of Valley City in Barnes County.

#### Population

Table 8.4.1 shows population trends for the city of Leal from 1920 to 2010, with an estimate for 2019.

Per the 2010 U.S. Decennial Census, the city of Leal has a population of 20 people, which is a decrease of 36 people (44.4 percent) from 36 people in 2000.

**Table 8.4.1 – 1920 to 2010 City of Leal, North Dakota Population Statistics**

1920	1930	1940	1950	1960	1970	1980	1990	2000	2010	2019 (est.)
88	105	102	72	70	41	45	35	36	20	18

Source(s): U.S. Decennial Census; American Community Survey, 5-Year Estimates

#### Vulnerable Populations

Age. Per the 2015 to 2019 American Community Survey 5-Year Estimate, the population of the city of Leal consists of no individuals under the age of 20 and three individuals aged 65 and older.

Daycares. There are no daycares in the city of Leal.

Poverty. Per the 2015 to 2019 American Community Survey 5-Year Estimate, there are 10 households in the city of Leal that live below the poverty line.

Public Schools. There is not a public school in the city of Leal.

Senior Housing Developments/Care Centers. There are no age-restricted, senior housing developments, or care centers in the city of Leal.

#### Housing Units and Household Size

The 2015 to 2019 American Community Survey 5-Year Estimate shows there is a total of 10 housing units in the city consisting entirely of single-family homes.

The 2015 to 2019 American Community Survey 5-Year Estimate shows there are 10 households in the city of Leal resulting in an average household size of 1.60 people.

### **Businesses**

There are no major employers in the city of Leal. Additional information on businesses and economic development in the city of Leal or can be obtained by contacting the Valley City-Barnes County Development Group.

### **New and Future Development**

New development is considered any development occurring since the 2015 Barnes County Multi-Hazard Mitigation Plan. Future development is considered any development that is planned, pending, or proposed. No new or future development was identified at the time of this update.

### **Buildings, Critical Facilities and Infrastructure, and Services and Utilities Provided**

The following section profiles the housing units, services, emergency response services, jurisdictional buildings, and utilities of the city of Leal. Tables 3.10 to 3.13 in Chapter 3, Profile and Inventory show a complete inventory of this information for Barnes County and incorporated jurisdictions. An “X” indicates if the jurisdiction offers the utility or service (either through contract or employees) or possesses the building or resource. Narratives detailing information for the county and incorporated jurisdictions accompany each table.

Structures. Housing units show where populations are located. Table 3.9 in Chapter 3, Profile and Inventory shows the number of single-family, mobile home structures, and multifamily and in Barnes County and incorporated jurisdictions. The following are key points for the city of Leal:

- There are 63 single-family housing units comprising 100.0 percent of all housing units in the city of Leal.
- There are no Mobile/Boat/RV/Van homes or Multifamily housing units in the city of Leal.

Critical Facilities. The following facilities were identified as critical in the city of Leal.

- Leal Fire Hall (also serves as city hall and a storm shelter)

Infrastructure. The following infrastructure was identified as critical in the city of Leal.

- The city of Leal does not have a sanitary sewer system. Residents utilize septic systems.
- The city of Leal is located on N.D. Highway 9.

Emergency Response Services. The following emergency response services were identified in the city of Leal.

- Barnes County Ambulance provides ambulance services to the city of Leal.
- The city contracts with the Dazey Fire Department and District to provide fire protection to the city and surrounding area. The city, however, possesses a fire truck and has a fire hall.
- The Barnes County Sheriff's Office provides law enforcement services to the city of Leal.
- The city has one first responder. The first responder takes calls from Jamestown or Valley City and is certified through the Wimbledon Fire Department.
- The nearest hospital is CHI-Mercy Hospital in Valley City.

- City-County Health District is in the city of Valley City and provides public health services to the city of Leal.

Services and Utilities. The following services are provided in the city of Leal.

- Dakota Sanitation provides garbage collection services to the city of Leal.
- The city of Leal does not maintain an inert landfill, but inert debris are disposed of east of the city.
- The city of Leal does not have a sanitary sewer system. Residents utilize septic systems.
- The city has a storm water system consisting of drainage ditches.
- The Valley City Times-Record is the official newspaper of the city of Leal.
- Barnes Rural Water District provides drinking/potable water to the city of Leal.
- Electricity is provided by Otter Tail Power.
- Natural gas is not available in the city of Leal.
- Fuel oil, propane, and electricity are used as an alternative heating source and is provided by companies chosen by the individual consumer.
- BEK provides phone and internet.

**8.4.2 Risk Assessment and Hazard Scoring Notes**

Table 8.4.2 summarizes the risk assessment scoring of the city of Leal. The risk assessment and hazard scoring notes for each hazard specific to the city are shown in Table 8.4.3. Risk assessment notes for impact, frequency, likelihood and vulnerability ubiquitous for jurisdictions in Barnes County are found in Chapter 4, Threat and Hazard Identification Assessment in each respective hazard profile.

**Table 8.4.2 – City of Leal Jurisdiction Risk Assessment Scoring Summary**

<b>Risk Assessment</b>							<b>Jurisdiction: City of Leal</b>					
<b><u>Natural Hazard</u></b>	<b><u>Impact</u></b>	<b><u>Frequency</u></b>	<b><u>Likelihood</u></b>	<b><u>Vulnerability</u></b>	<b><u>Capabilities</u></b>	<b><u>Total</u></b>						
Drought	2	2	1	1	3	<b>3</b>						
Fire – Urban/Structure Collapse	2	2	2	3	1	<b>8</b>						
Fire – Wildland (Rural)	4	2	2	3	1	<b>10</b>						
Flood	4	2	3	3	2	<b>10</b>						
Geologic Hazard	NA	NA	NA	NA	NA	<b>NA</b>						
Infectious Disease	2	2	2	1	2	<b>5</b>						
Severe Summer Weather	4	3	3	3	2	<b>11</b>						
Severe Winter Weather	3	3	4	4	2	<b>12</b>						
Space Weather	4	1	2	3	1	<b>9</b>						
<b><u>Adversarial Threats</u></b>												
Civil Disturbance	4	2	2	3	2	<b>9</b>						
Criminal, Terrorist or Nation-State Attack	4	2	2	3	2	<b>9</b>						
Cyberattack	4	1	2	3	1	<b>9</b>						
<b><u>Technological Threats</u></b>												
Dam Failure	NA	NA	NA	NA	NA	<b>NA</b>						
Hazardous Material Release	4	2	4	4	1	<b>13</b>						
Transportation Incident	4	2	3	4	2	<b>11</b>						

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 8.4.3 – City of Leal Jurisdiction Risk Assessment

	<b>Civil Disturbance</b>	
<b>Impact</b>	<ul style="list-style-type: none"> <li>Blocked Roads</li> <li>Business Interruptions</li> <li>Delayed Emergency Response</li> <li>Financial Hardship/Strain (public)</li> </ul>	<ul style="list-style-type: none"> <li>HAZMAT Release – oil trains and natural gas pipeline</li> <li>Human Injury/Death</li> <li>Property Damage (Structure)</li> <li>Property Damage (Vehicle)</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>Never an occurrence of a major incident</li> </ul>	<ul style="list-style-type: none"> <li>DAPL protesters were not active in the city</li> </ul>
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> <li>Presence of railroad infrastructure</li> <li>Presence of public school</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No pipelines</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> <li>Presence of railroad infrastructure</li> <li>Presence of public school</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No pipelines</li> </ul>

Table 8.4.3 – City of Leal Jurisdiction Risk Assessment – Continued

Criminal, Terrorist, Nation-State Attack			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> <li>• Human Injury/Death</li> <li>• Property Damage (Structure)</li> <li>• Property Damage (Vehicle)</li> </ul> <ul style="list-style-type: none"> <li>• <b>Threats to city water supply</b></li> <li>• Mass Casualties/Fatalities</li> <li>• Loss of Communication Systems</li> <li>• Disease Outbreak/Mass Infections</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No occurrences</li> <li>• Miscellaneous property damage occurring in the city on an occasional basis</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>
<u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>
<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>		

Table 8.4.3 – City of Leal Jurisdiction Risk Assessment – Continued

Cyberattack			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> <li>• Human Injury/Death</li> <li>• School Closure</li> <li>• <b>Loss of Communication Systems</b></li> <li>• Identity Theft – loss of wages and/or assets</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never an occurrence of a major attack</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Presence of railroad infrastructure</li> <li>• Presence of public school nearby</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Presence of railroad infrastructure</li> <li>• Presence of public school nearby</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No pipelines</li> </ul>
<u>More Likely</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Presence of railroad infrastructure</li> <li>• Presence of public school nearby</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No pipelines</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Elderly population relying largely on landlines for communication purposes, remote medical care and equipment monitoring</li> <li>• Presence of railroad infrastructure</li> <li>• Presence of public school nearby</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Elderly population relying largely on landlines for communication purposes, remote medical care and equipment monitoring</li> <li>• Presence of railroad infrastructure</li> <li>• Presence of public school nearby</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No pipelines</li> </ul>
<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Elderly population relying largely on landlines for communication purposes, remote medical care and equipment monitoring</li> <li>• Presence of railroad infrastructure</li> <li>• Presence of public school nearby</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No pipelines</li> </ul>		

Table 8.4.3 – City of Leal Jurisdiction Risk Assessment - Continued

		Drought	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Loss of Economy</li> <li>• Loss of Livestock</li> <li>• Loss of Wildlife Habitat (decreased wildlife populations)</li> <li>• Increase in Wildland Fire Potential</li> </ul>	<ul style="list-style-type: none"> <li>• Water quality compromised from stock dams</li> <li>• Diminished soil quality – salinity will increase</li> <li>• Negative impact on mental health of producers and fire responders – “community impact”</li> <li>• Local producers forced to sell off herds which can last for several years</li> <li>• Population loss as people moved away due to loss of economy</li> </ul>	
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Severe Drought of 1961/1962, 1988/1989 to 1991/1992</li> <li>• Summer of 2017, local producers forced to sell off portions of their herds</li> </ul>	<ul style="list-style-type: none"> <li>• End of July through winter of 2016 – county reached severe drought status</li> <li>• Severe drought in summer/fall of 2020</li> </ul>	
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Dry/wet cycle every five to eight years</li> <li>• Climatic patterns will result in an eventual drought of significance</li> <li>• Lack of precipitation</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Heavy precipitation</li> </ul>	
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Wildlife &amp; hunting economy</li> <li>• Agriculture economy</li> <li>• Elderly population</li> <li>• Flat terrain/open topography contributes to conditions</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• City does not have a water tower</li> <li>• City does not have a fire index sign</li> <li>• Sloughs by railroad tracks-never mowed and could become start and spread if the wind is right</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Financial assistance programs made available by the state and federal government</li> <li>• Burn Ban by county emergency management</li> <li>• Fire Index monitoring and mapping from NDDDES</li> <li>• Advanced communications such as internet and TV</li> <li>• Mowing through special assessment to keep vegetation under control</li> <li>• Residents have backup individual wells</li> <li>• City receives drinking/potable water from Barnes Rural Water District</li> </ul>	



Table 8.4.3 – City of Leal Jurisdiction Risk Assessment - Continued

Fire – Urban Fire/Structure Collapse			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• HAZMAT Release</li> </ul> <ul style="list-style-type: none"> <li>• Human Injury/Death</li> <li>• Increase Fire Potential</li> <li>• Property damage on a significant scale if impacting downtown structures</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Occurrences of structures/vehicles being impacted every five years</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Age of structures on main street</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• Railroad infrastructure traversing city limits</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Adopted building codes</li> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Age of structures on main street</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• Railroad infrastructure traversing city limits</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Adopted building codes</li> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> </ul>
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<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Age of structures</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• Fire Hall does not have a permanent or portable generator</li> <li>• Prolonged response times due to limited fire staff during the daytime</li> <li>• City Auditor’s Office conducts business on paper and maintains hard copy records</li> <li>• Railroad infrastructure traversing city limits</li> <li>• Lack of building code enforcement</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Adopted building codes</li> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Age of structures</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• Fire Hall does not have a permanent or portable generator</li> <li>• Prolonged response times due to limited fire staff during the daytime</li> <li>• City Auditor’s Office conducts business on paper and maintains hard copy records</li> <li>• Railroad infrastructure traversing city limits</li> <li>• Lack of building code enforcement</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Adopted building codes</li> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> </ul>
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Table 8.4.3 – City of Leal Jurisdiction Risk Assessment – Continued

Fire – Rural & Wildland			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Crop Loss</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• Increase Fire Potential</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Mass Casualties</li> <li>• Losses could be on a significant scale if impacting a major producer or farmstead</li> <li>• Loss of farm equipment and assets</li> <li>• Loss of Livestock</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Significant fire once every five years</li> <li>• Approximately four wildland fires occurring annually</li> <li>• Controlled burns becoming out of control approximately 25 percent of the time</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> <li>• Railroad infrastructure traversing through city limits</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> <li>• Railroad infrastructure traversing through city limits</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> </ul>
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<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> <li>• Large fire district – strained coverage/resources</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of fire breaks around city limits</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Removal of CRP</li> <li>• Summer and winter weather with heavy precipitation</li> <li>• MOUs with neighboring fire departments</li> <li>• Burn bans by county emergency management for areas outside city limits</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> <li>• Large fire district – strained coverage/resources</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of fire breaks around city limits</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Removal of CRP</li> <li>• Summer and winter weather with heavy precipitation</li> <li>• MOUs with neighboring fire departments</li> <li>• Burn bans by county emergency management for areas outside city limits</li> </ul>
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Table 8.4.3 – City of Leal Jurisdiction Risk Assessment – Continued

		Flood	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• <b>Blocked Roads:</b> road traversing under CP railroad</li> <li>• Delayed Emergency Response</li> <li>• Flooding (Highway &amp; Structure)</li> <li>• Human Injury/Death</li> <li>• Property Damage / Sewer Backup</li> <li>• Runoff from buildings causes overland flooding</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Bi-annual occurrences of localized flooding of nearby township roads and highways</li> </ul>	<ul style="list-style-type: none"> <li>• Flash flooding occurs from heavy precipitation</li> <li>• Overland flooding from 2009 flood-water came from 10-mile lake which is one mile away</li> </ul>	
<b>Likelihood</b>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Dry seasons and low precipitation</li> <li>• City performs storm water drainage maintenance</li> </ul>	
<b>Vulnerability</b>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> <li>• Overland flooding from 2009 flood-water came from 10-mile lake which is one mile away</li> <li>• East end of town receives heavy flooding from spring melt, drainage of water, etc.</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Culvert installed on Railway Avenue decreases likelihood of standing water</li> </ul>	

Table 8.4.3 – City of Leal Jurisdiction Risk Assessment – Continued

	<b>Geologic Hazard</b>	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Delayed Emergency Response</li> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of Power</li> <li>• Property Damage</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No incidents involving geologic hazards in or near city limits</li> </ul>	
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul>

Table 8.4.3 – City of Leal Jurisdiction Risk Assessment – Continued

Hazardous Material Release			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Delayed Emergency Response / Increased Fire Potential</li> <li>• Environmental Degradation</li> <li>• Evacuation (localized)</li> <li>• Explosion</li> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> <li>• Loss of Potable Water</li> <li>• Loss of Power</li> <li>• Property Damage</li> <li>• Increased risk of HAZMAT release and/or transportation incidents due to increased oil train traffic and trucks</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Small incidents of leaking anhydrous tanks bi-annually</li> <li>• Never any major spills reported</li> <li>• Never a pipeline leak</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines nearby</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Agrium Ammonia storage two miles east of town</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines nearby</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Agrium Ammonia storage two miles east of town</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> </ul>
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<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy and related industries</li> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines nearby</li> <li>• No hospital or medical clinic in city limits</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Designated truck route in the city of Leal</li> <li>• Fire departments have some HAZMAT training</li> <li>• Manual-activated emergency siren</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy and related industries</li> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines nearby</li> <li>• No hospital or medical clinic in city limits</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Designated truck route in the city of Leal</li> <li>• Fire departments have some HAZMAT training</li> <li>• Manual-activated emergency siren</li> </ul>
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Table 8.4.3 – City of Leal Jurisdiction Risk Assessment – Continued

	Infectious Disease	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Human Injury/Death</li> <li>• Livestock Loss</li> <li>• Loss of Economy</li> <li>• Mass Casualties</li> </ul>	<ul style="list-style-type: none"> <li>• Strain on local medical resources (ambulance)</li> <li>• Loss of medical staff due to sickness</li> <li>• Loss of Potable Water</li> <li>• Financial cost to public health resources</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Annual occurrences of death, primarily among the elderly</li> <li>• Occurrence of disease - 1 in 3 for people annually</li> <li>• Annual occurrences of influenza cases in the local population</li> </ul>	<ul style="list-style-type: none"> <li>• The COVID-19 Pandemic of 2020 resulted in mass quarantine and sheltering of the local population and temporary closure of businesses</li> </ul>
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• Dependent on weather for animals and crops</li> <li>• Transporting of animals across state lines</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• Transporting of animals across state lines</li> <li>• No hospital or medical clinic</li> <li>• No vet clinic in city limits</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> <li>• Immunizations &amp; medications of local population</li> <li>• No care center in the city</li> <li>• No public school</li> </ul>

Table 8.4.3 – City of Leal Jurisdiction Risk Assessment – Continued

Severe Summer Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – heat exhaustion</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> <li>• Vehicle Damage</li> <li>• Loss of Livestock</li> <li>• Loss of Crops</li> <li>• Loss of Power/Downed Power Lines -</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Heavy rain from time to time during summer months</li> <li>• Hail 3 miles south in 2014</li> <li>• Some high winds and strong storms per summer season</li> <li>• Annual occurrences of hailstorms</li> <li>• Two or three significant storms producing damage to trees and property annually</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of building code enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of building code enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> </ul>
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Table 8.4.3 – City of Leal Jurisdiction Risk Assessment – Continued

Severe Winter Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – wind chill</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> <li>• Loss of Crops</li> <li>• Loss of Livestock</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> <li>• Vehicle Damage</li> <li>• Infrastructure Degradation</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• March 2017 snowstorm resulted in blocked roads throughout the city</li> <li>• Spring snowstorm of 2019</li> <li>• Annual occurrences of power loss from storms</li> <li>• Two or three significant blizzards producing damage to trees and property annually</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of building code enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> <li>• City has a portable generator</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of building code enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> <li>• City has a portable generator</li> </ul>
<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of building code enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> <li>• City has a portable generator</li> </ul>		



Table 8.4.3 – City of Leal Jurisdiction Risk Assessment – Continued

Space Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Loss of operation of the city hall, fire hall, lift station, etc.</li> <li>• Loss/outage of medical devices at private residences</li> <li>• Property damage from sewer backups due to loss of lift station</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never a recorded occurrence in Barnes County or North Dakota</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Dependent on solar activity and the 11-year solar cycle</li> <li>• Likely to occur once every 500 years per the 2018 N.D. Enhanced Mitigation MAOP</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> <li>• City Auditor’s Office conducts business on paper and maintains hard copy records</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> <li>• City Auditor’s Office conducts business on paper and maintains hard copy records</li> </ul>
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Table 8.4.3 – City of Leal Jurisdiction Risk Assessment – Continued

Transportation Incident			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• <b>Blocked roads from inadequate road clearing</b></li> <li>• Human Injury/Death</li> <li>• Increased Fire Potential</li> <li>• Loss of Transportation/Accessibility</li> <li>• Mass Casualties/Fatalities</li> </ul> <ul style="list-style-type: none"> <li>• Delayed Emergency Response</li> <li>• HAZMAT Release</li> <li>• Livestock Loss</li> <li>• Business Interruptions</li> <li>• Property Damage</li> <li>• Could be catastrophic if involving a school bus filled with children and a truck carrying hazardous materials</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Annual occurrences of accidents involving cars and/or farm equipment</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Intoxicated drivers</li> <li>• <b>High truck traffic from agriculture-related traffic</b></li> <li>• <b>Railroad infrastructure traversing through city limits</b></li> <li>• </li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• No commercial passenger airport</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Intoxicated drivers</li> <li>• <b>High truck traffic from agriculture-related traffic</b></li> <li>• <b>Railroad infrastructure traversing through city limits</b></li> <li>• </li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• No commercial passenger airport</li> </ul>
<u>More Likely</u> <ul style="list-style-type: none"> <li>• Intoxicated drivers</li> <li>• <b>High truck traffic from agriculture-related traffic</b></li> <li>• <b>Railroad infrastructure traversing through city limits</b></li> <li>• </li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• No commercial passenger airport</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Intoxicated drivers</li> <li>• <b>High truck traffic from agriculture-related traffic</b></li> <li>• <b>No hospital or medical clinic</b></li> <li>• <b>Railroad infrastructure traversing through city limits</b></li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• No commercial passenger airport</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Intoxicated drivers</li> <li>• <b>High truck traffic from agriculture-related traffic</b></li> <li>• <b>No hospital or medical clinic</b></li> <li>• <b>Railroad infrastructure traversing through city limits</b></li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• No commercial passenger airport</li> </ul>
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### 8.4.3 Mitigation Strategy

The Barnes County Multi-Jurisdictional Multi-Hazard Plan Update includes a mitigation strategy consisting of seven goals in Chapter 6. The following problem statement and mitigation projects address the mitigation needs of the city of Leal. It should be noted that some mitigation projects that pertain to all jurisdictions are included to encourage county-wide collaboration.

#### **Problem Statement**

The city of Leal experiences overland flooding from 10 Mile Lake due to surrounding topography and inadequate drainage, which impacts infrastructure. The culvert under the CPR railroad line is suspected to have collapsed, further exacerbating flooding issues. The city has a manually-activated emergency siren instead of a siren activated by county-dispatch. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Improved drainage/flood control measures and an upgraded outdoor emergency system are a priority for the city.

**City of Leal Project 1: Upgrade culvert under CP railroad line to improve drainage.**

Description/Benefit		Improve drainage and eliminate overland flooding issues that causes damage to infrastructure and people’s homes. Maintain flow of runoff to control growth of vegetation to minimize fire hazard and spread of disease.					
Hazards Addressed		All					
Affected Jurisdiction(s)		City of Leal					
Project Status		Ongoing and Continue					
Priority		High					
Responsible Agency		City Council, Emergency Services					
Partners		County Commission, Emergency Management, NDAC, NDLC, Regional Council					
Completion Timeframe		2 to 3 years	Cost	TBD			
Funding Source		Local budgets. CP Railroad.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Work with CP railroad to secure funding and implement upgrades.		

**City of Leal Project 2: Upgrade manually-activated outdoor emergency siren.**

Description/Benefit	The city’s outdoor emergency siren is manually activated and needs to be upgraded to provide radio-activation capabilities.						
Hazards Addressed	All						
Affected Jurisdiction(s)	City of Leal						
Project Status	New						
Priority	Very High						
Responsible Agency	City Council, Emergency Services						
Partners	County Commission, Emergency Management NDAC, NDLC, Regional Council						
Completion Timeframe	2 to 3 years	Cost	Up to \$25,000 for a new siren				
Funding Source	Local budgets. N.D. League of Cities. State Homeland Security Grants. NDDDES.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Include in city and/or fire department’s capital improvement plan. Apply for grant funding or purchase directly using existing sales tax revenue or budgets. Approval city council or board.		

#### 8.4.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: administrative and technical, education and outreach, financial, and planning and regulatory. Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. **Tables comparing the mitigation capabilities of the city of Leal with all other jurisdictions in Barnes County can be found below and in Chapter 7, County Mitigation Capability Assessment.**

- Administrative and Technical: Identification of administrative and technical capabilities, which include staff, their skills and tools for mitigation planning to implement specific mitigation actions.
- Education and Outreach: Identification of education and outreach programs, and methods already in place to implement mitigation activities and communicate hazard-related information.
- Financial: Identification of access to or eligibility to use funding resources for hazard mitigation for jurisdictions.
- Planning and Regulatory: Jurisdictional plans, policies, codes, and ordinances adopted and in place that prevent and reduce the impacts of hazards.

#### City of Leal Mitigation Capabilities

Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. Information on the capabilities of the city was gathered at its jurisdictional meeting, committee meetings, and interviews during the planning process.

#### Administrative and Technical

The following narrative details the administrative and technical capabilities of the city of Leal.

The city of Leal has an active city council. The city does not have a chief building official or inspector. The county LEPC serves the city. The city does not have a civil engineer on staff but can contract for engineering services when needed. The county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning, grant writing and grant administration services as it does not have staff for those capabilities. The city conducts mowing on vacant lots and charges \$300 per year per lot. Other infrastructure maintenance is conducted on an as-needed basis. The city has a mutual aid agreement for emergency services through the county-wide agreement. The city has an emergency siren located on top of the fire hall, but it is not adequate as it is manually activated. The city does not have any generators. The fire ISO rating for the city is unknown. The city does not have a fire index sign. Emergency services are not GIS capable. The city council reports hazard data to the emergency manager. The city does not have Firewise or StormReady Certification.

### **Education and Outreach**

The following narrative details the education and outreach capabilities of the city of Leal.

The city does not have non-profit organizations providing education on hazards but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. However, Barnes County North is located approximately three miles west of the city where education and outreach is provided to students. The city does not have any entities providing public education on hazard but has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

### **Financial**

The following narrative details the financial capabilities of the city of Leal.

The city maintains a general fund and not a separate account for capital improvements. The city does not have storm water utility fee as it lacks a storm water system. The city does not assess any sanitary sewer fees despite having a sanitary sewer system. The city does not levy special assessments for new development but can do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also can do so if warranted. The city issues building permits through the county. The city has access to CDBG funds through the SCDRC. The city does not have any private entities provide funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

### **Planning and Regulatory**

The following narrative details the planning and regulatory capabilities of the city of Leal.

The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning but utilizes the county zoning for regulation of development. The city does not have subdivision ordinances or impact fees. The city issues building permits through the county. The city council serves as the planning commission for the city. The city adopted the county's building codes but does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

### **8.4.5 Integration of Mitigation Plan into Planning Mechanisms**

Integration of the plan into current planning mechanisms is critical in mitigation to communicate the needs of each jurisdiction to achieve an all-inclusive mitigation strategy. The process for integration of the mitigation plan is included after each mitigation project, which shows the planning mechanism utilized, the plan element used for integration and the process for integration.

### **8.4.6 Plan Maintenance**

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.



## 8.5 City of Litchville, North Dakota

The following profile includes information specific to the city of Litchville for mitigation planning purposes. The information included is as follows:

- Profile and Inventory;
- Risk Assessment;
- Hazard Scoring Notes;
- Mitigation Projects, and
- Capabilities for Mitigation.

### **Integration into Planning Mechanisms**

The process for integration of the mitigation plan into existing planning mechanisms is discussed at the bottom of each mitigation project in section 8.5.3, in section 8.5.4, and in Chapter 6, Mitigation Strategy.

### **Plan Maintenance**

Plan maintenance is shown in section 8.5.6.

### **Critical Facilities and Infrastructure**

Figure 8.5.1 is a map of the city of Litchville provided by Barnes County Emergency Management.

Figure 8.5.1 – City of Litchville, North Dakota



Source(s): Barnes County Emergency Management

**8.5.1 Profile and Inventory**

The location, total population, vulnerable populations, housing units and household size, businesses, critical facilities and infrastructure, new and future development, services, jurisdictional buildings, emergency response services and utilities are shown for the city of Litchville. Detailed narratives follow each section heading to profile the city.

Detailed information on public buildings, services provided, emergency response services and utilities can be found can be found in Chapter 3, Profile and Inventory.

**Location**

The city of Litchville is located on Barnes County Highway 11, approximately 30 miles south-southwest of Valley City in Barnes County.

**Population**

Table 8.5.1 shows population trends for the city of Litchville from 1920 to 2010, with an estimate for 2019.

Per the 2010 U.S. Decennial Census, the city of Litchville has a population of 172 people, which is a decrease of 19 people (9.9 percent) from 191 people in 2000.

**Table 8.5.1 – 1920 to 2010 City of Litchville, North Dakota Population Statistics**

1920	1930	1940	1950	1960	1970	1980	1990	2000	2010	2019 (est.)
528	410	430	408	345	294	251	205	191	172	150

Source(s): U.S. Decennial Census; American Community Survey, 5-Year Estimates

**Vulnerable Populations**

Age. Per the 2015 to 2019 American Community Survey 5-Year Estimate, the population of the city of Litchville consists of 62 individuals under the age of 20 and 28 individuals aged 65 and older.

Daycares. There are no daycares in the city of Litchville.

Poverty. Per the 2015 to 2019 American Community Survey 5-Year Estimate, there are 22 households in the city of Litchville that live below the poverty line.

Public Schools. The Litchville-Marion School is separate into two separate schools with the elementary school in the city of Litchville with the high school in the city of Marion in neighboring LaMoure County. As of the 2020-2021 fall enrollment, 126 students are enrolled in grades K-12.

Senior Housing Developments/Care Centers. There are no age-restricted, senior housing developments, or care centers in the city of Litchville.

**Housing Units and Household Size**

The 2015 to 2019 American Community Survey 5-Year Estimate shows there is a total of 121 housing units in the city consisting of 102 single-family homes, no mobile/RV homes, and 17 multifamily homes.

The 2015 to 2019 American Community Survey 5-Year Estimate shows there are 89 households in the city of Litchville resulting in an average household size of 2.26 people.

### **Businesses**

There are no major employers in the city of Litchville. Additional information on businesses and economic development in the city of Litchville or can be obtained by contacting the Valley City-Barnes County Development Group.

### **New and Future Development**

New development is considered any development occurring since the 2015 Barnes County Multi-Hazard Mitigation Plan. Future development is considered any development that is planned, pending, or proposed. No new and future development was identified at the time of this plan update.

### **Buildings, Critical Facilities and Infrastructure, and Services and Utilities Provided**

The following section profiles the housing units, services, emergency response services, jurisdictional buildings, and utilities of the city of Litchville. Tables 3.10 to 3.13 in Chapter 3, Profile and Inventory show a complete inventory of this information for Barnes County and incorporated jurisdictions. An “X” indicates if the jurisdiction offers the utility or service (either through contract or employees) or possesses the building or resource. Narratives detailing information for the county and incorporated jurisdictions accompany each table.

Structures. Housing units show where populations are located. Table 3.9 in Chapter 3, Profile and Inventory shows the number of single-family, mobile home structures, and multifamily and in Barnes County and incorporated jurisdictions. The following are key points for the city of Litchville:

- There are 102 single-family housing units comprising 84.3 percent of all housing units in the city of Litchville.
- There are two Mobile/Boat/RV/Van homes comprising 1.7 percent of all housing units in the city of Litchville
- There are 17 Multifamily housing units comprising 14.0 percent of all housing units in the city of Litchville.

Critical Facilities. The following facilities were identified as critical in the city of Litchville.

- Barnes County Shop.
- Litchville City Hall/Community Center (also serves as a storm shelter).
- Litchville Fire Hall.
- U.S. Post Office.

Infrastructure. The following infrastructure was identified as critical in the city of Litchville.

- The city of Litchville has a sanitary sewer system with two lagoon cells and a lift station. There are no septic systems in the city of Litchville.
- The city is of Litchville is located on Barnes County Highway 11.

- Litchville-Marion Elementary School.

Emergency Response Services. The following emergency response services were identified in the city of Litchville.

- Barnes County Ambulance provides ambulance services to the city of Litchville.
- The Litchville Fire Department provide fire protection to the city and surrounding area.
- The Barnes County Sherriff's Office provides law enforcement services to the city of Litchville.
- The city has eight first responders.
- The nearest hospital is CHI-Mercy Hospital in Valley City.
- City-County Health District is in the city of Valley City and provides public health services to the city of Litchville.

Services and Utilities. The following services are provided in the city of Litchville.

- Sanitation Specialists provides garbage collection services to the city of Litchville.
- The city of Litchville does not maintain an inert landfill.
- The city of Litchville has a sanitary sewer system with two lagoon cells and a lift station. There are no septic systems in the city of Litchville.
- The city has a storm water system consisting of drainage ditches.
- The Litchville Bulletin is the official newspaper of the city of Litchville.
- Barnes Rural Water District provides drinking/potable water to the city of Litchville.
- Electricity is provided by Otter Tail Power.
- Natural gas is not available in the city of Litchville.
- Fuel oil, propane, and electricity are used as an alternative heating source and is provided by companies chosen by the individual consumer.
- Dickey Rural Networks provides phone and internet.

### 8.5.2 Risk Assessment and Hazard Scoring Notes

Table 8.5.2 summarizes the risk assessment scoring of the city of Litchville. The risk assessment and hazard scoring notes for each hazard specific to the city are shown in Table 8.5.3. Risk assessment notes for impact, frequency, likelihood and vulnerability ubiquitous for jurisdictions in Barnes County are found in Chapter 4, Threat and Hazard Identification Assessment in each respective hazard profile.

**Table 8.5.2 – City of Litchville Jurisdiction Risk Assessment Scoring Summary**

<b>Risk Assessment</b>							<b>Jurisdiction: City of Litchville</b>						
<b><u>Natural Hazard</u></b>	<b><u>Impact</u></b>	<b><u>Frequency</u></b>	<b><u>Likelihood</u></b>	<b><u>Vulnerability</u></b>	<b><u>Capabilities</u></b>	<b><u>Total</u></b>							
Drought	3	2	2	2	3	<b>6</b>							
Fire – Urban/Structure Collapse	1	1	2	3	2	<b>5</b>							
Fire – Wildland (Rural)	2	2	2	2	3	<b>5</b>							
Flood	2	2	2	2	2	<b>6</b>							
Geologic Hazard	NA	NA	NA	NA	NA	<b>NA</b>							
Infectious Disease	1	2	2	1	3	<b>3</b>							
Severe Summer Weather	3	3	4	3	1	<b>12</b>							
Severe Winter Weather	2	3	1	2	3	<b>5</b>							
Space Weather	4	1	2	3	1	<b>9</b>							
<b><u>Adversarial Threats</u></b>													
Civil Disturbance	1	1	1	1	2	<b>2</b>							
Criminal, Terrorist or Nation-State Attack	1	1	1	1	2	<b>2</b>							
Cyberattack	4	1	2	3	1	<b>9</b>							
<b><u>Technological Threats</u></b>													
Dam Failure	NA	NA	NA	NA	NA	<b>NA</b>							
Hazardous Material Release	3	2	1	2	3	<b>5</b>							
Transportation Incident	1	1	1	2	3	<b>2</b>							

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 8.5.3 – City of Litchville Jurisdiction Risk Assessment

	<b>Civil Disturbance</b>	
<b>Impact</b>	<ul style="list-style-type: none"> <li>Blocked Roads</li> <li>Business Interruptions</li> <li>Delayed Emergency Response</li> <li>Financial Hardship/Strain (public)</li> </ul>	<ul style="list-style-type: none"> <li>HAZMAT Release – oil trains and natural gas pipeline</li> <li>Human Injury/Death</li> <li>Property Damage (Structure)</li> <li>Property Damage (Vehicle)</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>Never an occurrence of a major incident</li> </ul>	<ul style="list-style-type: none"> <li>DAPL protesters were not active in the city</li> </ul>
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No railroad infrastructure or pipelines</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No railroad infrastructure or pipelines</li> </ul>

Table 8.5.3 – City of Litchville Jurisdiction Risk Assessment – Continued

Criminal, Terrorist, Nation-State Attack			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> <li>• Human Injury/Death</li> <li>• Property Damage (Structure)</li> <li>• Property Damage (Vehicle)</li> </ul> <ul style="list-style-type: none"> <li>• <b>Threats to city water supply</b></li> <li>• Mass Casualties/Fatalities</li> <li>• Loss of Communication Systems</li> <li>• Disease Outbreak/Mass Infections</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No occurrences</li> <li>• Miscellaneous property damage occurring in the city on an occasional basis</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No railroad infrastructure or pipelines</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No railroad infrastructure or pipelines</li> </ul>
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Table 8.5.3 – City of Litchville Jurisdiction Risk Assessment – Continued

	Cyberattack	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> </ul>	<ul style="list-style-type: none"> <li>• Human Injury/Death</li> <li>• School Closure</li> <li>• <b>Loss of Communication Systems</b></li> <li>• Identity Theft – loss of wages and/or assets</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never an occurrence of a major attack</li> </ul>	
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• No public School</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No railroad infrastructure or pipelines</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Elderly population relying largely on landlines for communication purposes, remote medical care and equipment monitoring</li> <li>• Presence of public school</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No railroad infrastructure or pipelines</li> </ul>

Table 8.5.3 – City of Litchville Jurisdiction Risk Assessment - Continued

Drought	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Loss of Economy</li> <li>• Loss of Livestock</li> <li>• Loss of Wildlife Habitat (decreased wildlife populations)</li> <li>• Increase in Wildland Fire Potential</li> </ul> <ul style="list-style-type: none"> <li>• Water quality compromised from stock dams</li> <li>• Diminished soil quality – salinity will increase</li> <li>• Negative impact on mental health of producers and fire responders – “community impact”</li> <li>• Local producers forced to sell off herds which can last for several years</li> <li>• Population loss as people moved away due to loss of economy</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Severe Drought of 1961/1962, 1988/1989 to 1991/1992</li> <li>• Summer of 2017, local producers forced to sell off portions of their herds</li> </ul> <ul style="list-style-type: none"> <li>• End of July through winter of 2016 – county reached severe drought status</li> <li>• Severe drought in summer/fall of 2020</li> </ul>
<b>Likelihood</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Dry/wet cycle every five to eight years</li> <li>• Climatic patterns will result in an eventual drought of significance</li> <li>• Lack of precipitation</li> </ul> </div> <div style="width: 45%;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Heavy precipitation</li> </ul> </div> </div>
<b>Vulnerability</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Wildlife &amp; hunting economy</li> <li>• Agriculture economy</li> <li>• Elderly population</li> <li>• Flat terrain/open topography contributes to conditions</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• City does not have a fire index sign</li> </ul> </div> <div style="width: 45%;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Financial assistance programs made available by the state and federal government</li> <li>• Burn Ban by county emergency management</li> <li>• Fire Index monitoring and mapping from NDDDES</li> <li>• Advanced communications such as internet and TV</li> <li>• City has a water tower</li> <li>• Back up water supply of 50,000-gallon tank</li> <li>• City receives drinking/potable water from Barnes Rural Water District</li> </ul> </div> </div>

Table 8.5.3 – City of Litchville Jurisdiction Risk Assessment - Continued

Fire – Urban Fire/Structure Collapse			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• HAZMAT Release</li> </ul> <ul style="list-style-type: none"> <li>• Human Injury/Death</li> <li>• Increase Fire Potential</li> <li>• Property damage on a significant scale if impacting downtown structures</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Occurrences of structures/vehicles being impacted every five years</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Age of structures on main street</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> <li>• Back up water supply of 50,000-gallon tank</li> <li>• No railroad infrastructure through city limits</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Age of structures on main street</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> <li>• Back up water supply of 50,000-gallon tank</li> <li>• No railroad infrastructure through city limits</li> </ul>
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Table 8.5.3 – City of Litchville Jurisdiction Risk Assessment – Continued

Fire – Rural & Wildland			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Crop Loss</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• Increase Fire Potential</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Mass Casualties</li> <li>• Losses could be on a significant scale if impacting a major producer or farmstead</li> <li>• Loss of farm equipment and assets</li> <li>• Loss of Livestock</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Significant fire once every five years</li> <li>• Approximately four wildland fires occurring annually</li> <li>• Controlled burns becoming out of control approximately 25 percent of the time</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> </ul>
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<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> <li>• Large fire district – strained coverage/resources</li> <li>• <b>Lack of fire breaks around city limits</b></li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Removal of CRP</li> <li>• Summer and winter weather with heavy precipitation</li> <li>• MOUs with neighboring fire departments</li> <li>• Burn bans by county emergency management for areas outside city limits</li> <li>• Back up water supply of 50,000-gallon tank</li> <li>• No railroad infrastructure through city limits</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> <li>• Large fire district – strained coverage/resources</li> <li>• <b>Lack of fire breaks around city limits</b></li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Removal of CRP</li> <li>• Summer and winter weather with heavy precipitation</li> <li>• MOUs with neighboring fire departments</li> <li>• Burn bans by county emergency management for areas outside city limits</li> <li>• Back up water supply of 50,000-gallon tank</li> <li>• No railroad infrastructure through city limits</li> </ul>
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Table 8.5.3 – City of Litchville Jurisdiction Risk Assessment – Continued

Flood			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• <b>Blocked Roads:</b> Intersection of 5<sup>th</sup> St. and 4<sup>th</sup> Ave, NP Ave from 3<sup>rd</sup> St. to 4<sup>th</sup> St., City Park, drainage riving on the north-northwest side of the city from the intersection of 2<sup>nd</sup> St. and 5<sup>th</sup> Ave to the intersection of 4<sup>th</sup> St. and 1<sup>st</sup> Ave.</li> <li>• Delayed Emergency Response</li> <li>• Flooding (Highway &amp; Structure)</li> <li>• Human Injury/Death</li> <li>• Property Damage / Sewer Backup</li> <li>• Runoff from buildings causes overland flooding</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• When raining heavy, roads become blocked and is expected</li> <li>• Each year it occurs</li> <li>• Sump pumps are constantly running on a wet year</li> <li>• Flash flooding occurs from heavy precipitation</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Dry seasons and low precipitation</li> <li>• City performs storm water drainage maintenance</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Dry seasons and low precipitation</li> <li>• City performs storm water drainage maintenance</li> </ul>
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<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> <li>• Local topography of the city with closed basins</li> <li>• City does not have flood ordinances</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Alternate routes were identified for townships roads</li> <li>• City performs storm water drainage maintenance</li> <li>• Public school is located on high ground</li> <li>• City is enrolled in the FIP</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> <li>• Local topography of the city with closed basins</li> <li>• City does not have flood ordinances</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Alternate routes were identified for townships roads</li> <li>• City performs storm water drainage maintenance</li> <li>• Public school is located on high ground</li> <li>• City is enrolled in the FIP</li> </ul>
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Table 8.5.3 – City of Litchville Jurisdiction Risk Assessment – Continued

	<b>Geologic Hazard</b>	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Delayed Emergency Response</li> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of Power</li> <li>• Property Damage</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No incidents involving geologic hazards in or near city limits</li> </ul>	
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul>

Table 8.5.3 – City of Litchville Jurisdiction Risk Assessment – Continued

Hazardous Material Release			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Delayed Emergency Response / Increased Fire Potential</li> <li>• Environmental Degradation</li> <li>• Evacuation (localized)</li> <li>• Explosion</li> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> <li>• Loss of Potable Water</li> <li>• Loss of Power</li> <li>• Property Damage</li> <li>• Increased risk of HAZMAT release and/or transportation incidents due to increased oil train traffic and trucks</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Small incidents of leaking anhydrous tanks bi-annually</li> <li>• Never any major spills reported</li> <li>• Never a pipeline leak</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> <li>• No railroad infrastructure through city limits</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> <li>• No railroad infrastructure through city limits</li> <li>• No pipelines</li> </ul>
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Table 8.5.3 – City of Litchville Jurisdiction Risk Assessment – Continued

Infectious Disease			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Human Injury/Death</li> <li>• Livestock Loss</li> <li>• Loss of Economy</li> <li>• Mass Casualties</li> <li>• Strain on local medical resources (ambulance)</li> <li>• Loss of medical staff due to sickness</li> <li>• Loss of Potable Water</li> <li>• Financial cost to public health resources</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Annual occurrences of death, primarily among the elderly</li> <li>• Occurrence of disease - 1 in 3 for people annually</li> <li>• Annual occurrences of influenza cases in the local population</li> <li>• The COVID-19 Pandemic of 2020 resulted in mass quarantine and sheltering of the local population and temporary closure of businesses</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• Dependent on weather for animals and crops</li> <li>• Transporting of animals across state lines</li> <li>• Abandoned properties can lead to rodent infestation</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> <li>• City mows most lawns and keeps vegetation under control</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• Dependent on weather for animals and crops</li> <li>• Transporting of animals across state lines</li> <li>• Abandoned properties can lead to rodent infestation</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> <li>• City mows most lawns and keeps vegetation under control</li> </ul>
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Table 8.5.3 – City of Litchville Jurisdiction Risk Assessment – Continued

Severe Summer Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• <b>Blocked Roads:</b> Intersection of 5<sup>th</sup> St. and 4<sup>th</sup> Ave, NP Ave from 3<sup>rd</sup> St. to 4<sup>th</sup> St., City Park, drainage riving on the north-northwest side of the city from the intersection of 2<sup>nd</sup> St. and 5<sup>th</sup> Ave to the intersection of 4<sup>th</sup> St. and 1<sup>st</sup> Ave.</li> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – heat exhaustion</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> </ul> <ul style="list-style-type: none"> <li>• Vehicle Damage</li> <li>• Loss of Livestock</li> <li>• Loss of Crops</li> <li>• Loss of Power/Downed Power Lines -</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Heavy rain from time to time</li> <li>• Not much hail recently</li> <li>• Some high winds and strong storms per summer season</li> <li>• Straight line winds about 6 to 7 years ago-lots of trees blew down</li> </ul> <ul style="list-style-type: none"> <li>• Annual occurrences of hailstorms</li> <li>• Two or three significant storms producing damage to trees and property annually</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at city hall, fire hall, lift station, and public school</li> <li>• Lack of building codes and enforcement</li> <li>• Manual-activated emergency siren</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes</li> <li>• Manual-activated emergency siren</li> <li>• No railroad infrastructure through city limits</li> </ul> </td> </tr> </table>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at city hall, fire hall, lift station, and public school</li> <li>• Lack of building codes and enforcement</li> <li>• Manual-activated emergency siren</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes</li> <li>• Manual-activated emergency siren</li> <li>• No railroad infrastructure through city limits</li> </ul>
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Table 8.5.3 – City of Litchville Jurisdiction Risk Assessment – Continued

Severe Winter Weather	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• <b>Blocked Roads:</b> Intersection of 5<sup>th</sup> St. and 4<sup>th</sup> Ave, NP Ave from 3<sup>rd</sup> St. to 4<sup>th</sup> St., City Park, drainage riving on the north-northwest side of the city from the intersection of 2<sup>nd</sup> St. and 5<sup>th</sup> Ave to the intersection of 4<sup>th</sup> St. and 1<sup>st</sup> Ave.</li> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – wind chill</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> </ul> <ul style="list-style-type: none"> <li>• Loss of Crops</li> <li>• Loss of Livestock</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> <li>• Vehicle Damage</li> <li>• Infrastructure Degradation</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• March 2017 snowstorm resulted in blocked roads throughout the city</li> <li>• Spring snowstorm of 2019</li> <li>• Annual occurrences of power loss from storms</li> <li>• Two or three significant blizzards producing damage to trees and property annually</li> </ul> <ul style="list-style-type: none"> <li>• Happens yearly, weather and climate in the area</li> <li>• High winds and ground blizzard conditions</li> </ul>
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> </ul> <ul style="list-style-type: none"> <li>• Removal of shelter belts and vegetation leads to more ground blizzard conditions-happening outside of town but nowhere near city limits</li> </ul>
<b>Vulnerability</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at community center, fire hall, lift station, and public school</li> <li>• Lack of building codes and enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Lack of adequate storm water drainage system</li> <li>• Presence of public school</li> </ul> </div> <div style="width: 45%;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Manual-activated emergency siren</li> <li>• No railroad infrastructure through city limits</li> </ul> </div> </div>

Table 8.5.3 – City of Litchville Jurisdiction Risk Assessment – Continued

Space Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Loss of operation of the city hall, fire hall, lift station, etc.</li> <li>• Loss/outage of medical devices at private residences</li> <li>• Property damage from sewer backups due to loss of lift station</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never a recorded occurrence in Barnes County or North Dakota</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Dependent on solar activity and the 11-year solar cycle</li> <li>• Likely to occur once every 500 years per the 2018 N.D. Enhanced Mitigation MAOP</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> <li>• Lack of permanent generator at community center, fire hall, lift station, and public school</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> <li>• Lack of permanent generator at community center, fire hall, lift station, and public school</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> </ul>
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Table 8.5.3 – City of Litchville Jurisdiction Risk Assessment – Continued

	Transportation Incident	
<b>Impact</b>	<ul style="list-style-type: none"> <li>Blocked roads from inadequate road clearing</li> <li>Human Injury/Death</li> <li>Increased Fire Potential</li> <li>Loss of Transportation/Accessibility</li> <li>Mass Casualties/Fatalities</li> </ul>	<ul style="list-style-type: none"> <li>Delayed Emergency Response</li> <li>HAZMAT Release</li> <li>Livestock Loss</li> <li>Business Interruptions</li> <li>Property Damage</li> <li>Could be catastrophic if involving a school bus filled with children and a truck carrying hazardous materials</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>Annual occurrences of accidents involving cars and/or farm equipment</li> </ul>	<ul style="list-style-type: none"> <li>Three motorcycles and a pickup crashed summer 2013</li> <li>Alcohol-related accidents occur every few years</li> </ul>
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Intoxicated drivers</li> <li>High truck traffic from agriculture-related traffic</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>No commercial passenger airport</li> <li>No railroad infrastructure traversing city limits</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Intoxicated drivers</li> <li>High truck traffic from agriculture-related traffic</li> <li>No hospital or medical clinic</li> <li>Lack of paved streets</li> <li>Lack of street signage, crosswalks, and sidewalks</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>No commercial passenger airport</li> <li>Presence of designated truck routes through city limits</li> <li>No railroad infrastructure traversing city limits</li> </ul>

### 8.5.3 Mitigation Strategy

The Barnes County Multi-Jurisdictional Multi-Hazard Plan Update includes a mitigation strategy consisting of seven goals in Chapter 6. The following problem statement and mitigation projects address the mitigation needs of the city of Litchville. It should be noted that some mitigation projects that pertain to all jurisdictions are included to encourage county-wide collaboration.

#### **Problem Statement**

The city of Litchville is vulnerable to flooding and severe summer weather as the city's storm water system is inadequate. Flooding occurs on city streets primarily near the city park. The city does have a storm water drainage system, but the system lacks the capacity to allow for property drainage. Windstorms and high wind during severe summer weather also causes damage to structures in the city from fallen tree branches and wind-blown debris. Debris can also clog drainage and contribute to overland flooding. Critical facilities and infrastructure lack backup sources of power. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Engineering to upgrade/retrofit the storm water drainage system, improved drainage at the city park, creation of a tree trimming maintenance system, and installation of backup generators at critical facilities and infrastructure are a priority for the city.

**City of Litchville Project 1: Install permanent generators at critical facilities and infrastructure.**

Description/Benefit		Test existing generators and create regularly scheduled maintenance system. Install new generators to establish permanent source of backup power to maintain continued operation of the following critical facilities and infrastructure.					
		<u>Install New</u> <ul style="list-style-type: none"> <li>• Community Center</li> <li>• Litchville Fire Hall</li> <li>• Lift station</li> <li>• Litchville-Marion Elementary School</li> <li>• Rusty Spur (private business located in a concrete structure that is used for sheltering)</li> </ul>					
Hazards Addressed		All hazards					
Affected Jurisdiction(s)		City of Litchville					
Project Status		New					
Priority		Very High					
Responsible Agency		City Council, Public Works, Emergency Services					
Partners		Emergency Management, Public Utilities					
Completion Timeframe		2 to 3 years	Cost	Project-specific			
Funding Source		Public Utilities, Regional Council, RD. FEMA Pre-Disaster Mitigation Grant Program (PDM). State Homeland Security grants.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	4	5	33
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Include in city, school, and/or fire department's budget. Apply for grant funding or purchase directly using existing sales tax revenue or budgets. Approval city council or board.		

**City of Litchville Project 2: Establish permanent drainage for the city park to eliminate occurrences of overland flooding.**

Description/Benefit		Reduction of damage to critical facilities and infrastructure from annual flooding to assure access for emergency services and continued operation of public infrastructure. Reduce or eliminate damage to people’s homes.					
Hazards Addressed		Drought, Fire, Flood (overland), Infectious Disease, Severe Summer Weather, Severe Winter Weather,					
Affected Jurisdiction(s)		City of Litchville					
Project Status		Ongoing and Continue					
Priority		High					
Responsible Agency		City Council, Public Works					
Partners		Emergency Management, Emergency Services, DWR					
Completion Timeframe		2 to 3 years	Cost	TBD			
Funding Source		Local budgets. State and federal grants. DWR.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	3	5	5	33
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Include in city’s public works infrastructure maintenance schedule.		

**City of Litchville Project 3: Create and implement tree trimming maintenance system.**

Description/Benefit		Eliminate debris from drainage ditches to maintain flow of runoff to eliminate standing water and flooding of people’s homes. To control growth of vegetation to minimize fire hazard, spread of disease, and impacts from severe weather.					
Hazards Addressed		Fire, Flood, Infectious Disease, Severe Summer Weather, Severe Winter Weather					
Affected Jurisdiction(s)		City of Litchville					
Project Status		Ongoing and Continue					
Priority		Medium					
Responsible Agency		City Council, Public Works					
Partners		Emergency Management, Emergency Services, DWR, Public Utilities					
Completion Timeframe		2 to 3 years	Cost	Project-specific			
Funding Source		Local budgets. Public Utilities.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	3	5	5	32
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Include in city’s public works infrastructure maintenance schedule.		



**City of Litchville Project 4: Conduct engineering study to identify solutions to update/retrofit storm water drainage system.**

Description/Benefit		Overland flooding occurs at the intersection of 5 <sup>th</sup> St. and 4 <sup>th</sup> Ave, NP Ave from 3 <sup>rd</sup> St. to 4 <sup>th</sup> St., City Park, drainage riving on the north-northwest side of the city from the intersection of 2 <sup>nd</sup> St. and 5 <sup>th</sup> Ave to the intersection of 4 <sup>th</sup> St. and 1 <sup>st</sup> Ave. Overland flooding impacts city street causing erosion, frost boils, divets, etc.					
		Reduction of damage to critical facilities and infrastructure from annual flooding to assure access for emergency services and continued operation of public infrastructure. Reduce or eliminate damage to people’s homes. Maintain flow of runoff to eliminate standing water blocking roads to maintain access for city residents and emergency services and continued operation of public infrastructure.					
Hazards Addressed		Flood, Infectious Disease, Severe Summer Weather, Severe Winter Weather					
Affected Jurisdiction(s)		City of Litchville					
Project Status		New/Ongoing and Continue					
Priority		High					
Responsible Agency		City Council, Public Works					
Partners		County Commission, NDAC, NDLC, Regional Council, private contractors, DWR					
Completion Timeframe		2 to 3 years	Cost	Project-specific			
Funding Source		Local budgets. N.D. League of Cities. SWC.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	3	5	5	32
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			City solicits three engineering proposals from qualified firms. Select appropriate firm based on proposals. Apply for grant funding. Execute project. Submit reimbursements and close-out grant.		

### 8.5.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: administrative and technical, education and outreach, financial, and planning and regulatory. Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. **Tables comparing the mitigation capabilities of the city of Litchville with all other jurisdictions in Barnes County can be found below and in Chapter 7, County Mitigation Capability Assessment.**

- Administrative and Technical: Identification of administrative and technical capabilities, which include staff, their skills and tools for mitigation planning to implement specific mitigation actions.
- Education and Outreach: Identification of education and outreach programs, and methods already in place to implement mitigation activities and communicate hazard-related information.
- Financial: Identification of access to or eligibility to use funding resources for hazard mitigation for jurisdictions.
- Planning and Regulatory: Jurisdictional plans, policies, codes, and ordinances adopted and in place that prevent and reduce the impacts of hazards.

#### City of Litchville Mitigation Capabilities

Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. Information on the capabilities of the city was gathered at its jurisdictional meeting, committee meetings, and interviews during the planning process.

#### Administrative and Technical

The following narrative details the administrative and technical capabilities of the city of Litchville.

The city of Litchville has an active city council. The city does not have a chief building official or inspector. The county LEPC serves the city. The city does not have a civil engineer on staff but can contract for engineering services when needed. The county emergency manager is the floodplain administrator/manager. The city auditor has grant writing and administrative capabilities. The city can also contract with the SCDRC or a private firm for planning, grant writing and grant administration services. The city does not have any infrastructure maintenance programs, but conducts maintenance on trees, vegetation and the sanitary sewer system on an as-needed basis. Mutual aid agreements are signed with the cities of Kathryn and Sanborn, and the cities of LaMoure and Marion in neighboring LaMoure County. The city is also part of the county-wide mutual aid agreement for emergency services. The city has an emergency siren located on top of the water tower. The city has two generators; one for the sanitary sewer lift station and the other for the water tower to keep water circulating to avoid freezing in winter months. The fire ISO rating for the city is unknown. The city has a fire index sign located at the corner of Main Street. Emergency services are not GIS capable. The city auditor reports hazard data to the emergency manager. The city is not Firewise or StormReady certified.

### **Education and Outreach**

The following narrative details the education and outreach capabilities of the city of Litchville.

The city does not have non-profit organizations providing education on hazards but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. Fire prevention week is conducted at the elementary school on an annual basis. The Litchville Fire District and Department conducts education aside from fire prevention week at the elementary school when necessary. The city also has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

### **Financial**

The following narrative details the financial capabilities of the city of Litchville.

The city maintains a general fund and not a separate account for capital improvements. The city does not assess a storm water utility fee despite having a storm water system. The city uses revenue from the general fund for storm water improvements. The city does special assess \$17 per month on the property tax bill for maintenance of the sanitary sewer system. The city took out a loan for a new lagoon. The city does not levy special assessments for new development but can do so if warranted. The city issues building permits. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

### **Planning and Regulatory**

The following narrative details the planning and regulatory capabilities of the city of Litchville.

The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning, subdivision ordinances or impact fees. The city issues its own building permits. The city council serves as the planning commission for the city. The city has no adopted building codes and does not have an inspector. The city is FEMA flood mapped but does not have flood ordinances. The city does not have a flood damage reduction study but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

#### **8.5.5 Integration of Mitigation Plan into Planning Mechanisms**

Integration of the plan into current planning mechanisms is critical in mitigation to communicate the needs of each jurisdiction to achieve an all-inclusive mitigation strategy. The process for integration of

the mitigation plan is included after each mitigation project, which shows the planning mechanism utilized, the plan element used for integration and the process for integration.

### **8.5.6 Plan Maintenance**

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.

## 8.6 City of Nome, North Dakota

The following profile includes information specific to the city of Nome for mitigation planning purposes. The information included is as follows:

- Profile and Inventory;
- Risk Assessment;
- Hazard Scoring Notes;
- Mitigation Projects, and
- Capabilities for Mitigation.

### **Integration into Planning Mechanisms**

The process for integration of the mitigation plan into existing planning mechanisms is discussed at the bottom of each mitigation project in section 8.6.3, in section 8.6.4, and in Chapter 6, Mitigation Strategy.

### **Plan Maintenance**

Plan maintenance is shown in section 8.6.6.

### **Critical Facilities and Infrastructure**

Figure 8.6.1 is a map of the city of Nome provided by Barnes County Emergency Management.

Figure 8.6.1 – City of Nome, North Dakota



Source(s): Barnes County Emergency Management

**8.6.1 Profile and Inventory**

The location, total population, vulnerable populations, housing units and household size, businesses, critical facilities and infrastructure, new and future development, services, jurisdictional buildings, emergency response services and utilities are shown for the city of Nome. Detailed narratives follow each section heading to profile the city.

Detailed information on public buildings, services provided, emergency response services and utilities can be found can be found in Chapter 3, Profile and Inventory.

**Location**

The city of Nome is located on N.D. Highway 32, approximately 28 miles south-southeast of Valley City in Barnes County.

**Population**

Table 8.6.1 shows population trends for the city of Nome from 1920 to 2010, with an estimate for 2019.

Per the 2010 U.S. Decennial Census, the city of Nome has a population of 62 people, which is a decrease of eight people (11.4 percent) from 70 people in 2000.

**Table 8.6.1 – 1920 to 2010 City of Nome, North Dakota Population Statistics**

1920	1930	1940	1950	1960	1970	1980	1990	2000	2010	2019 (est.)
267	218	277	217	145	103	67	82	70	62	56

Source(s): U.S. Decennial Census; American Community Survey, 5-Year Estimates

**Vulnerable Populations**

Age. Per the 2015 to 2019 American Community Survey 5-Year Estimate, the population of the city of Nome consists of 10 individuals under the age of 20 and seven individuals aged 65 and older. **According to profile meeting participants, the city of Nome consist of 15 individuals under the age of 20 and 14 individuals age 65 and over.**

Daycares. There are no daycares in the city of Nome.

Poverty. Per the 2015 to 2019 American Community Survey 5-Year Estimate, no households in the city of Nome that live below the poverty line.

Public Schools. The is not a public school in the city of Nome.

Senior Housing Developments/Care Centers. There are no age-restricted, senior housing developments, or care centers in the city of Nome.

**Housing Units and Household Size**

The 2015 to 2019 American Community Survey 5-Year Estimate shows there is a total of 20 housing units in the city consisting entirely of single-family homes.

The 2015 to 2019 American Community Survey 5-Year Estimate shows there are 15 households in the city of Nome resulting in an average household size of 2.57 people.

### **Businesses**

There are no major employers in the city of Nome. Additional information on businesses and economic development in the city of Nome or can be obtained by contacting the Valley City-Barnes County Development Group.

### **New and Future Development**

New development is considered any development occurring since the 2015 Barnes County Multi-Hazard Mitigation Plan. Future development is considered any development that is planned, pending, or proposed. The following is a list of new and future development for the city of Nome.

#### New

- On June 2, 2021, the 2.5-year renovation on the Nome Schoolhouse was completed. The structure is a 105-year-old building that has been abandoned for 50 years. The building is used as an event space, gift shop, hotel rooms, and a shelter for the community.

#### Future

- No future development was identified at the time of this plan update.

### **Buildings, Critical Facilities and Infrastructure, and Services and Utilities Provided**

The following section profiles the housing units, services, emergency response services, jurisdictional buildings, and utilities of the city of Nome. Tables 3.10 to 3.13 in Chapter 3, Profile and Inventory show a complete inventory of this information for Barnes County and incorporated jurisdictions. An “X” indicates if the jurisdiction offers the utility or service (either through contract or employees) or possesses the building or resource. Narratives detailing information for the county and incorporated jurisdictions accompany each table.

Structures. Housing units show where populations are located. Table 3.9 in Chapter 3, Profile and Inventory shows the number of single-family, mobile home structures, and multifamily and in Barnes County and incorporated jurisdictions. The following are key points for the city of Nome:

- There are 20 single-family housing units comprising 100.0 percent of all housing units in the city of Nome.
- There are no Mobile/Boat/RV/Van homes or Multifamily housing units in the city of Nome
- According to the city of Nome, there are four mobile homes in the city.

Critical Facilities. The following facilities were identified as critical in the city of Nome.

- Nome City Hall
- Nome Fire Hall
- Home Schoolhouse



- U.S. Post Office

Infrastructure. The following infrastructure was identified as critical in the city of Nome.

- The city of Nome has a sanitary sewer system with two lagoon cells and a lift station with two pumps. There are no septic systems in the city of Nome.
- The city of Nome is located on N.D. Highway 32.

Emergency Response Services. The following emergency response services were identified in the city of Nome.

- Barnes County Ambulance provides ambulance services to the city of Nome.
- The Nome Fire Department provides fire protection to the city.
- The Barnes County Sheriff's Office provides law enforcement services to the city of Nome.
- There are two first responders living two miles south of the city.
- The nearest hospital is CHI-Mercy Hospital in Valley City.
- City-County Health District is in the city of Valley City and provides public health services to the city of Nome.

Services and Utilities. The following services are provided in the city of Nome.

- Fraedrich Transport provides garbage collection services to the city of Nome.
- The city of Nome does not maintain an inert landfill.
- The city of Nome has a sanitary sewer system with two lagoon cells and a lift station with two pumps. There are no septic systems in the city of Nome.
- The city has a storm water system consisting of drainage ditches.
- The Enderlin Independent is the official newspaper of the city of Nome.
- Barnes Rural Water District provides drinking/potable water to the city of Nome.
- Electricity is provided by Otter Tail Power.
- Natural gas is not available in the city of Nome.
- Fuel oil, propane, and electricity are used as an alternative heating source and is provided by companies chosen by the individual consumer.
- BEK provides phone and internet.

### 8.6.2 Risk Assessment and Hazard Scoring Notes

Table 8.6.2 summarizes the risk assessment scoring of the city of Nome. The risk assessment and hazard scoring notes for each hazard specific to the city are shown in Table 8.6.3. Risk assessment notes for impact, frequency, likelihood and vulnerability ubiquitous for jurisdictions in Barnes County are found in Chapter 4, Threat and Hazard Identification Assessment in each respective hazard profile.

**Table 8.6.2 – City of Nome Jurisdiction Risk Assessment Scoring Summary**

<b>Risk Assessment</b>							<b>Jurisdiction: City of Nome</b>						
<b><u>Natural Hazard</u></b>	<b><u>Impact</u></b>	<b><u>Frequency</u></b>	<b><u>Likelihood</u></b>	<b><u>Vulnerability</u></b>	<b><u>Capabilities</u></b>	<b><u>Total</u></b>							
Drought	2	1	1	4	1	7							
Fire – Urban/Structure Collapse	3	2	3	3	2	9							
Fire – Wildland (Rural)	3	2	2	2	2	7							
Flood	3	2	3	3	1	10							
Geologic Hazard	NA	NA	NA	NA	NA	NA							
Infectious Disease	1	2	1	3	1	6							
Severe Summer Weather	4	3	3	4	1	13							
Severe Winter Weather	3	3	3	3	1	11							
Space Weather	4	1	2	3	1	9							
<b><u>Adversarial Threats</u></b>													
Civil Disturbance	4	1	1	2	1	7							
Criminal, Terrorist or Nation-State Attack	4	1	1	2	1	7							
Cyberattack	4	1	2	2	1	8							
<b><u>Technological Threats</u></b>													
Dam Failure	NA	NA	NA	NA	NA	NA							
Hazardous Material Release	4	1	2	3	1	9							
Transportation Incident	2	2	3	3	2	8							

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 8.6.3 – City of Nome Jurisdiction Risk Assessment

	<b>Civil Disturbance</b>	
<b>Impact</b>	<ul style="list-style-type: none"> <li>Blocked Roads</li> <li>Business Interruptions</li> <li>Delayed Emergency Response</li> <li>Financial Hardship/Strain (public)</li> </ul>	<ul style="list-style-type: none"> <li>HAZMAT Release – oil trains and natural gas pipeline</li> <li>Human Injury/Death</li> <li>Property Damage (Structure)</li> <li>Property Damage (Vehicle)</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>Never an occurrence of a major incident</li> </ul>	<ul style="list-style-type: none"> <li>DAPL protesters were not active in the city</li> </ul>
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No railroad infrastructure or pipelines</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No railroad infrastructure or pipelines</li> </ul>

Table 8.6.3 – City of Nome Jurisdiction Risk Assessment – Continued

Criminal, Terrorist, Nation-State Attack			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> <li>• Human Injury/Death</li> <li>• Property Damage (Structure)</li> <li>• Property Damage (Vehicle)</li> </ul> <ul style="list-style-type: none"> <li>• <b>Threats to city water supply</b></li> <li>• Mass Casualties/Fatalities</li> <li>• Loss of Communication Systems</li> <li>• Disease Outbreak/Mass Infections</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No occurrences</li> <li>• Miscellaneous property damage occurring in the city on an occasional basis</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No railroad infrastructure or pipelines</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No railroad infrastructure or pipelines</li> </ul>
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<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No railroad infrastructure or pipelines</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No railroad infrastructure or pipelines</li> </ul>
<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No railroad infrastructure or pipelines</li> </ul>		

Table 8.6.3 – City of Nome Jurisdiction Risk Assessment – Continued

	Cyberattack	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> </ul>	<ul style="list-style-type: none"> <li>• Human Injury/Death</li> <li>• School Closure</li> <li>• <b>Loss of Communication Systems</b></li> <li>• Identity Theft – loss of wages and/or assets</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never an occurrence of a major attack</li> </ul>	
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No railroad infrastructure or pipelines</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Elderly population relying largely on landlines for communication purposes, remote medical care and equipment monitoring</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No railroad infrastructure or pipelines</li> </ul>

Table 8.7.3 – City of Nome Jurisdiction Risk Assessment - Continued

		Drought	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Loss of Economy</li> <li>• Loss of Livestock</li> <li>• Loss of Wildlife Habitat (decreased wildlife populations)</li> <li>• Increase in Wildland Fire Potential</li> </ul>	<ul style="list-style-type: none"> <li>• Water quality compromised from stock dams</li> <li>• Diminished soil quality – salinity will increase</li> <li>• Negative impact on mental health of producers and fire responders – “community impact”</li> <li>• Local producers forced to sell off herds which can last for several years</li> <li>• Population loss as people moved away due to loss of economy</li> </ul>	
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Severe Drought of 1961/1962, 1988/1989 to 1991/1992</li> <li>• Summer of 2017, local producers forced to sell off portions of their herds</li> </ul>	<ul style="list-style-type: none"> <li>• End of July through winter of 2016 – county reached severe drought status</li> <li>• Severe drought in summer/fall of 2020</li> </ul>	
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Dry/wet cycle every five to eight years</li> <li>• Climatic patterns will result in an eventual drought of significance</li> <li>• Lack of precipitation</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Heavy precipitation</li> </ul>	
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Wildlife &amp; hunting economy</li> <li>• Agriculture economy</li> <li>• Elderly population</li> <li>• Flat terrain/open topography contributes to conditions</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• City does not have a water tower</li> <li>• City does not have a fire index sign</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Financial assistance programs made available by the state and federal government</li> <li>• Burn Ban by county emergency management</li> <li>• Fire Index monitoring and mapping from NDDDES</li> <li>• Advanced communications such as internet and TV</li> <li>• Drinking/potable water received from Barnes Rural Water District</li> </ul>	

Table 8.7.3 – City of Nome Jurisdiction Risk Assessment - Continued

Fire – Urban Fire/Structure Collapse			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• HAZMAT Release</li> </ul> <ul style="list-style-type: none"> <li>• Human Injury/Death</li> <li>• Increase Fire Potential</li> <li>• Property damage on a significant scale if impacting downtown structures</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Occurrences of structures/vehicles being impacted every five years</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Age of structures on main street</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Adopted building codes</li> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Age of structures on main street</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Adopted building codes</li> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> </ul>
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Table 8.7.3 – City of Nome Jurisdiction Risk Assessment – Continued

Fire – Rural & Wildland			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Crop Loss</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• Increase Fire Potential</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Mass Casualties</li> <li>• Losses could be on a significant scale if impacting a major producer or farmstead</li> <li>• Loss of farm equipment and assets</li> <li>• Loss of Livestock</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Significant fire once every five years</li> <li>• Controlled burns becoming out of control approximately 20 percent of the time</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> </ul>
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Table 8.7.3 – City of Nome Jurisdiction Risk Assessment – Continued

	Flood	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• <b>Blocked Roads:</b> Occasionally 5<sup>th</sup> Ave</li> <li>• Delayed Emergency Response</li> <li>• Flooding (Highway &amp; Structure)</li> <li>• Human Injury/Death</li> <li>• Property Damage / Sewer Backup</li> <li>• Runoff from buildings causes overland flooding</li> </ul>	
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Heavy spring melting to heavy rains occurs yearly</li> <li>• Drainage of farmland may increase likelihood</li> </ul>	<ul style="list-style-type: none"> <li>• Flash flooding occurs from heavy precipitation</li> <li>• Large snow melt in spring of 2010 resulted in overland flooding of 5<sup>th</sup> Avenue</li> </ul>
<b>Likelihood</b>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Dry seasons and low precipitation</li> </ul>
<b>Vulnerability</b>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> <li>• Local topography of the city with closed basins</li> <li>• City is not enrolled in the NFIP</li> <li>• City does not have flood ordinances</li> <li>• City lacks proper storm water drainage system</li> <li>• Lagoon is inundated by heavy runoff decreasing efficiency</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Alternate routes were identified for townships roads</li> </ul>

Table 8.7.3 – City of Nome Jurisdiction Risk Assessment – Continued

	Geologic Hazard	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Delayed Emergency Response</li> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of Power</li> <li>• Property Damage</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No incidents involving geologic hazards in or near city limits</li> </ul>	
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul>

Table 8.7.3 – City of Nome Jurisdiction Risk Assessment – Continued

Hazardous Material Release			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Delayed Emergency Response / Increased Fire Potential</li> <li>• Environmental Degradation</li> <li>• Evacuation (localized)</li> <li>• Explosion</li> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> <li>• Loss of Potable Water</li> <li>• Loss of Power</li> <li>• Property Damage</li> <li>• Increased risk of HAZMAT release and/or transportation incidents due to increased oil train traffic and trucks</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Small incidents of leaking anhydrous tanks bi-annually</li> <li>• Never any major spills reported</li> <li>• Never a pipeline leak</li> <li>• Presence of oil trains</li> <li>• People do not have propane tanks in town on their properties for heating</li> <li>• More chemicals being stored in the area by farmers on their properties</li> <li>• Trucks transporting equipment have larger tanks, carrying more chemicals</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines nearby</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> <li>• Decrease in oil trains (from a frequency of one per hour) one the DAPL opened in 2017</li> </ul> </td> </tr> </table>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines nearby</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> <li>• Decrease in oil trains (from a frequency of one per hour) one the DAPL opened in 2017</li> </ul>
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Table 8.7.3 – City of Nome Jurisdiction Risk Assessment – Continued

Infectious Disease			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Human Injury/Death</li> <li>• Livestock Loss</li> <li>• Loss of Economy</li> <li>• Mass Casualties</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Annual occurrences of death, primarily among the elderly</li> <li>• Occurrence of disease - 1 in 3 for people annually</li> <li>• Annual occurrences of influenza cases in the local population</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• Dependent on weather for animals and crops</li> <li>• Transporting of animals across state lines</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> <li>• Improvements to 5<sup>th</sup> Avenue to allow proper drainage is complete and reduces standing water</li> <li>• Residents mow most lawns and keeps vegetation under control</li> </ul> </td> </tr> </table>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• Dependent on weather for animals and crops</li> <li>• Transporting of animals across state lines</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> <li>• Improvements to 5<sup>th</sup> Avenue to allow proper drainage is complete and reduces standing water</li> <li>• Residents mow most lawns and keeps vegetation under control</li> </ul>
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Table 8.7.3 – City of Nome Jurisdiction Risk Assessment – Continued

Severe Summer Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – heat exhaustion</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> <li>• Vehicle Damage</li> <li>• Loss of Livestock</li> <li>• Loss of Crops</li> <li>• Loss of Power/Downed Power Lines -</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Heavy rain from time to time</li> <li>• Not much hail recently</li> <li>• Couple high winds and strong storms per summer season</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at fire hall, lift station, pumphouse and schoolhouse</li> <li>• Lack of building code enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Lift station in low-lying area</li> <li>• City lacks proper storm water drainage system</li> <li>• Lagoon is inundated by heavy runoff decreasing efficiency</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> <li>• No railroad infrastructure through city limits</li> <li>• City has inert landfill</li> <li>• Old schoolhouse now served as a storm shelter</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at fire hall, lift station, pumphouse and schoolhouse</li> <li>• Lack of building code enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Lift station in low-lying area</li> <li>• City lacks proper storm water drainage system</li> <li>• Lagoon is inundated by heavy runoff decreasing efficiency</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> <li>• No railroad infrastructure through city limits</li> <li>• City has inert landfill</li> <li>• Old schoolhouse now served as a storm shelter</li> </ul>
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Table 8.7.3 – City of Nome Jurisdiction Risk Assessment – Continued

Severe Winter Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – wind chill</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> <li>• Loss of Crops</li> <li>• Loss of Livestock</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> <li>• Vehicle Damage</li> <li>• Infrastructure Degradation</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• March 2017 snowstorm resulted in blocked roads throughout the city</li> <li>• Spring snowstorm of 2019</li> <li>• Annual occurrences of power loss from storms</li> <li>• Two or three significant blizzards producing damage to trees and property annually</li> <li>• Removal of shelter belts and vegetation leads to more ground blizzard conditions</li> <li>• Ice storm occurred in 1997 resulting in temporary isolation of the community – National Guard was called in</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at fire hall, lift station, pumphouse and schoolhouse</li> <li>• Lack of building code enforcement</li> <li>• Manual-activated emergency siren</li> <li>• City lacks proper storm water drainage system</li> <li>• Portion of N.D. Highway 32 through the city is last priority by the State for clearing of snow</li> <li>• Lagoon is inundated by heavy runoff decreasing efficiency</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> <li>• No railroad infrastructure through city limits</li> <li>• Old schoolhouse now served as a storm shelter</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at fire hall, lift station, pumphouse and schoolhouse</li> <li>• Lack of building code enforcement</li> <li>• Manual-activated emergency siren</li> <li>• City lacks proper storm water drainage system</li> <li>• Portion of N.D. Highway 32 through the city is last priority by the State for clearing of snow</li> <li>• Lagoon is inundated by heavy runoff decreasing efficiency</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> <li>• No railroad infrastructure through city limits</li> <li>• Old schoolhouse now served as a storm shelter</li> </ul>
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Table 8.7.3 – City of Nome Jurisdiction Risk Assessment – Continued

Space Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Loss of operation of the city hall, fire hall, lift station, etc.</li> <li>• Loss/outage of medical devices at private residences</li> <li>• Property damage from sewer backups due to loss of lift station</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never a recorded occurrence in Barnes County or North Dakota</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Dependent on solar activity and the 11-year solar cycle</li> <li>• Likely to occur once every 500 years per the 2018 N.D. Enhanced Mitigation MAOP</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> <li>• Lack of permanent generator at city fire hall and lift station</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> <li>• City Auditor’s Office conducts business on paper and maintains hard copy records</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> <li>• Lack of permanent generator at city fire hall and lift station</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> <li>• City Auditor’s Office conducts business on paper and maintains hard copy records</li> </ul>
<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> <li>• Lack of permanent generator at city fire hall and lift station</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> <li>• City Auditor’s Office conducts business on paper and maintains hard copy records</li> </ul>		

Table 8.7.3 – City of Nome Jurisdiction Risk Assessment – Continued

	Transportation Incident	
Impact	<ul style="list-style-type: none"> <li>Blocked roads from inadequate road clearing</li> <li>Human Injury/Death</li> <li>Increased Fire Potential</li> <li>Loss of Transportation/Accessibility</li> <li>Mass Casualties/Fatalities</li> </ul>	<ul style="list-style-type: none"> <li>Delayed Emergency Response</li> <li>HAZMAT Release</li> <li>Livestock Loss</li> <li>Business Interruptions</li> <li>Property Damage</li> <li>Could be catastrophic if involving a school bus filled with children and a truck carrying hazardous materials</li> </ul>
Frequency	<ul style="list-style-type: none"> <li>Annual occurrences of accidents involving cars and/or farm equipment</li> </ul>	<ul style="list-style-type: none"> <li>One accident occurred in 2008 where a driver fell asleep and rolled his vehicle</li> </ul>
Likelihood	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Intoxicated drivers</li> <li>High truck traffic from agriculture-related traffic</li> <li>Railroad infrastructure traversing through city limits</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>No commercial passenger airport</li> </ul>
Vulnerability	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Intoxicated drivers</li> <li>High truck traffic from agriculture-related traffic</li> <li>No hospital or medical clinic</li> <li>Portion of N.D. Highway 32 through the city is last priority by the State for clearing of snow</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>No commercial passenger airport</li> <li>No railroad infrastructure through city limits</li> </ul>



### 8.6.3 Mitigation Strategy

The Barnes County Multi-Jurisdictional Multi-Hazard Plan Update includes a mitigation strategy consisting of seven goals in Chapter 6. The following problem statement and mitigation projects address the mitigation needs of the city of Nome. It should be noted that some mitigation projects that pertain to all jurisdictions are included to encourage county-wide collaboration.

#### **Problem Statement**

Severe summer weather and severe winter weather produce heavy precipitation impacting the city of Nome and its sanitary sewer lagoon system. Critical facilities and infrastructure lack generators for backup power. The city has a manually-activated emergency siren. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Engineering to upgrade/retrofit the lagoon system, installation of generators at critical facilities and infrastructure, upgrading of the outdoor early warning system are a priority for the city.

**City of Nome Project 1: Upgrade manually-activated outdoor emergency siren.**

Description/Benefit	The city’s outdoor emergency siren is manually activated and needs to be upgraded to provide radio-activation capabilities.						
Hazards Addressed	All						
Affected Jurisdiction(s)	City of Nome						
Project Status	Ongoing and Continue						
Priority	High						
Responsible Agency	City Council, Emergency Services						
Partners	County Commission, Emergency Management, NDAC, NDLC, Regional Council						
Completion Timeframe	2 to 3 years	Cost	Up to \$25,000 per siren				
Funding Source	Local budgets. N.D. League of Cities. State Homeland Security Grants. NDDDES.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Include in city and/or fire department’s capital improvement plan. Apply for grant funding or purchase directly using existing sales tax revenue or budgets. Approval city council or board.		

**City of Nome Project 2: Install permanent generators at critical facilities and infrastructure.**

Description/Benefit		Test existing generators and create regularly scheduled maintenance system. The city has a portable generator that needs updating Install new generators to establish permanent source of backup power to maintain continued operation of the following critical facilities and infrastructure.					
		<u>Install New</u> <ul style="list-style-type: none"> <li>• Nome Schoolhouse (storm shelter)</li> <li>• Fire Hall</li> <li>• Lift station</li> <li>• Pumphouse</li> </ul>					
Hazards Addressed		All hazards					
Affected Jurisdiction(s)		City of Nome					
Project Status		New					
Priority		High					
Responsible Agency		City Council, Public Works, Emergency Services					
Partners		Emergency Management, Public Utilities					
Completion Timeframe		2 to 3 years			Cost	Project-specific	
Funding Source		Public Utilities, Regional Council, RD. FEMA Pre-Disaster Mitigation Grant Program (PDM). State Homeland Security grants.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>			<u>Plan Element Utilized</u>			<u>Process for Integration</u>	
Barnes County LEOP & Mitigation Plan Barnes County THIRA			Capability Assessment, Hazard History, Risk Assessment			Include in city and/or fire department's budget. Apply for grant funding or purchase directly using existing sales tax revenue or budgets. Approval city council or board.	

**City of Nome Project 3: Conduct engineering studies to upgrade and/or retrofit critical facilities and infrastructure.**

Description/Benefit	The lagoon for the city of Nome is impacted by excess runoff and ground saturation affecting its efficiency.						
Hazard/Threat Addressed	Flood (overland), HAZMAT, Infection Disease, Severe Summer Weather, Severe Winter Weather (All)						
Affected Jurisdiction(s)	City of Nome						
Project Status	New						
Priority	High						
Responsible Agency	City Council, engineering firms, Public Works						
Partners	Emergency Management, Emergency Services, FEMA, NDDES, engineering firms, private contractors, SWC						
Completion Timeframe	Ongoing			Cost	Project-specific		
Funding Source	FEMA’s Building Resilient Infrastructure and Communities (BRIC). Local budgets. NDDEQ. Prairie Dog Fund.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	2	3	5	2	4	26
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Commission studies through a formal bidding process. Select contractor. Apply for grant funding to execute or budget in local budgets.		

#### 8.6.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: administrative and technical, education and outreach, financial, and planning and regulatory. Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. **Tables comparing the mitigation capabilities of the city of Nome with all other jurisdictions in Barnes County can be found below and in Chapter 7, County Mitigation Capability Assessment.**

- Administrative and Technical: Identification of administrative and technical capabilities, which include staff, their skills and tools for mitigation planning to implement specific mitigation actions.
- Education and Outreach: Identification of education and outreach programs, and methods already in place to implement mitigation activities and communicate hazard-related information.
- Financial: Identification of access to or eligibility to use funding resources for hazard mitigation for jurisdictions.
- Planning and Regulatory: Jurisdictional plans, policies, codes, and ordinances adopted and in place that prevent and reduce the impacts of hazards.

#### City of Nome Mitigation Capabilities

Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. Information on the capabilities of the city was gathered at its jurisdictional meeting, committee meetings, and interviews during the planning process.

#### Administrative and Technical

The following narrative details the administrative and technical capabilities of the city of Nome.

The city of Nome has an active city council. The city does not have a chief building official or inspector. The county LEPC serves the city. The city does not have a civil engineer but can contract with a private firm for civil engineering services. The county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city does not have staff for grant writing and administration purposes and relies on the emergency manager or the SCDRC for planning services, grant writing and grant administration. The city performs infrastructure maintenance on an as-needed basis, except for mowing. The city owns mowing equipment and pays an hourly wage for mowing of city lots. The city also has a contract with the city of Enderlin in neighboring Ransom County for mosquito spraying through a grant. Mutual aid agreements are signed with the city of Enderlin for fire protection. The city is also part of the county-wide mutual aid agreement for emergency services. The city has an emergency siren located on top of the fire hall, but it is not adequate as it is manually activated. The city does not have any generators. The fire ISO rating for the city is unknown. The city does not have a fire index sign. Emergency services are not GIS capable. The city council reports hazard data to the emergency manager. The city is not Firewise certified. The city does not have StormReady Certification.

### **Education and Outreach**

The following narrative details the education and outreach capabilities of the city of Nome.

The city does not have non-profit organizations providing education on hazards but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. The city does not have any entities providing public education on hazards but has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not have existing events where hazard education is conducted. However, the annual 4<sup>th</sup> of July community picnic and fire display provides an opportunity for hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

### **Financial**

The following narrative details the financial capabilities of the city of Nome.

The city has a city improvement account and pays for infrastructure projects from the account. The account is refunded through general revenue. The city does not assess a storm water utility fee as it does not have a storm water system. The city charges a sanitary sewer fee of \$8, plus a \$4 special fee for updating the sanitary sewer system, which is placed on the water/sewer/garbage bill. The city does not levy special assessments for new development but can do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also can do so if warranted. The city issues building permits for free. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

### **Planning and Regulatory**

The following narrative details the planning and regulatory capabilities of the city of Nome.

The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning, subdivision ordinances or impact fees. The city issues its own building permits for free. The city council serves as the planning commission for the city. The city adopted the state building codes in 2005/2006 but does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

### **8.6.5 Integration of Mitigation Plan into Planning Mechanisms**

Integration of the plan into current planning mechanisms is critical in mitigation to communicate the needs of each jurisdiction to achieve an all-inclusive mitigation strategy. The process for integration of the mitigation plan is included after each mitigation project, which shows the planning mechanism utilized, the plan element used for integration and the process for integration.

### **8.6.6 Plan Maintenance**

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.

### 8.7 City of Oriska, North Dakota

The following profile includes information specific to the city of Oriska for mitigation planning purposes. The information included is as follows:

- Profile and Inventory;
- Risk Assessment;
- Hazard Scoring Notes;
- Mitigation Projects, and
- Capabilities for Mitigation.

#### **Integration into Planning Mechanisms**

The process for integration of the mitigation plan into existing planning mechanisms is discussed at the bottom of each mitigation project in section 8.7.3, in section 8.7.4, and in Chapter 6, Mitigation Strategy.

#### **Plan Maintenance**

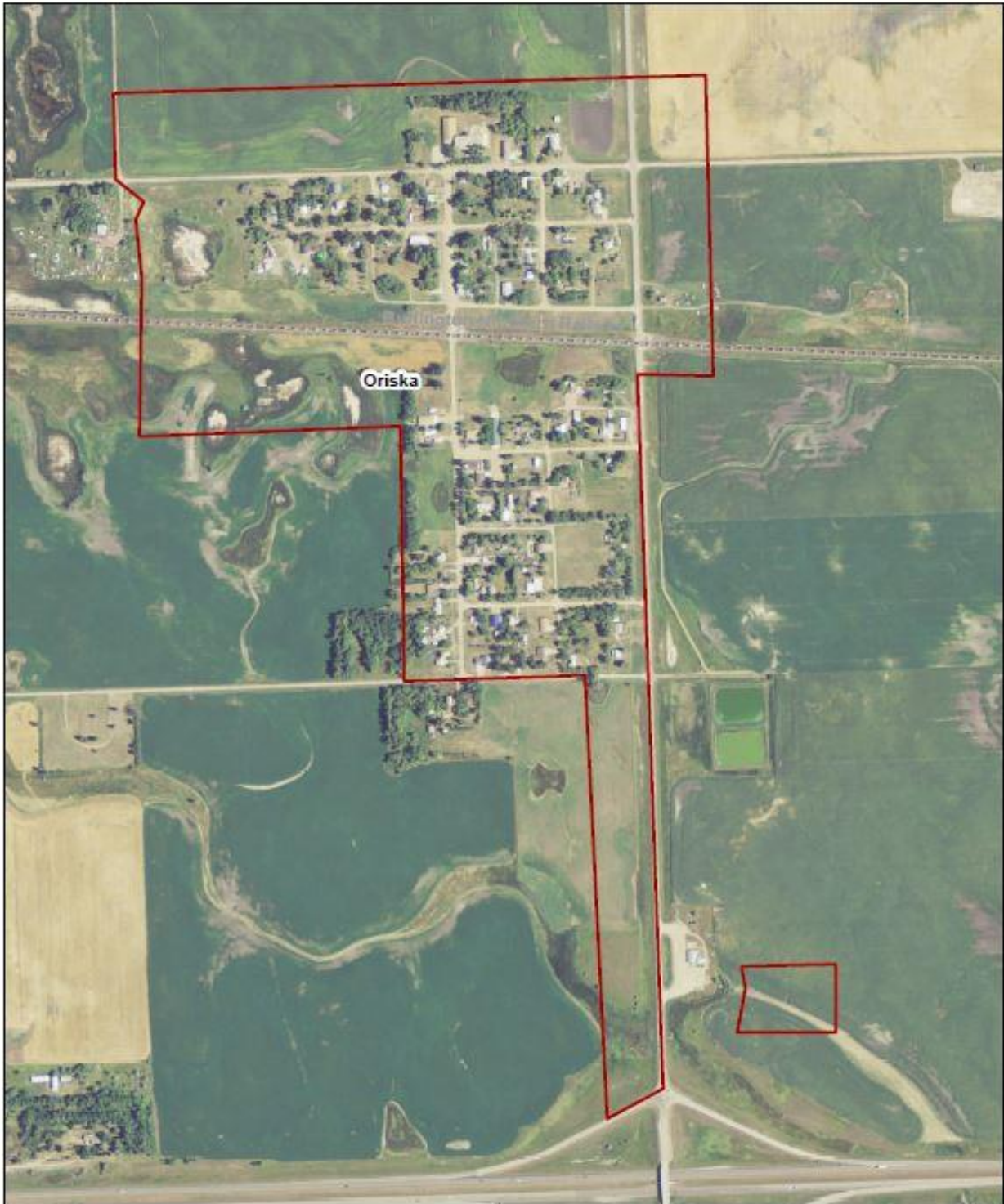
Plan maintenance is shown in section 8.7.6.

#### **Critical Facilities and Infrastructure**

Figure 8.7.1 is a map of the city of Oriska provided by Barnes County Emergency Management.



Figure 8.7.1 – City of Oriska, North Dakota



Source(s): Barnes County Emergency Management

### 8.7.1 Profile and Inventory

The location, total population, vulnerable populations, housing units and household size, businesses, critical facilities and infrastructure, new and future development, services, jurisdictional buildings, emergency response services and utilities are shown for the city of Oriska. Detailed narratives follow each section heading to profile the city.

Detailed information on public buildings, services provided, emergency response services and utilities can be found in Chapter 3, Profile and Inventory.

#### Location

The city of Oriska is located at the intersection of Interstate 94 and N.D. Highway 32, approximately 10 miles east of Valley City in Barnes County.

#### Population

Table 8.7.1 shows population trends for the city of Oriska from 1920 to 2010, with an estimate for 2019.

Per the 2010 U.S. Decennial Census, the city of Oriska has a population of 118 people, which is a decrease of 10 people (7.8 percent) from 128 people in 2000.

**Table 8.7.1 – 1920 to 2010 City of Oriska, North Dakota Population Statistics**

1920	1930	1940	1950	1960	1970	1980	1990	2000	2010	2019 (est.)
300	183	217	135	148	128	125	103	128	118	112

Source(s): U.S. Decennial Census; American Community Survey, 5-Year Estimates

#### Vulnerable Populations

Age. Per the 2015 to 2019 American Community Survey 5-Year Estimate, the population of the city of Oriska consists of 31 individuals under the age of 20 and 23 individuals aged 65 and older.

Daycares. There are no daycares in the city of Oriska.

Poverty. Per the 2015 to 2019 American Community Survey 5-Year Estimate, there are seven households in the city of Oriska that live below the poverty line.

Public Schools. There Oriska Elementary School is in Oriska and serves as the community center and storm shelter, and has a gymnasium and multi-purpose rooms. The community library is also located in the school.

Senior Housing Developments/Care Centers. There are no age-restricted, senior housing developments, or care centers in the city of Oriska.

#### Housing Units and Household Size

The 2015 to 2019 American Community Survey 5-Year Estimate shows there is a total of 59 housing units in the city consisting of 52 single-family homes, seven mobile/RV homes, and no multifamily homes.

The 2015 to 2019 American Community Survey 5-Year Estimate shows there are 47 households in the city of Oriska resulting in an average household size of 2.32 people.

### **Businesses**

There are no major employers in the city of Oriska. Additional information on businesses and economic development in the city of Oriska or can be obtained by contacting the Valley City-Barnes County Development Group.

### **New and Future Development**

New development is considered any development occurring since the 2015 Barnes County Multi-Hazard Mitigation Plan. Future development is considered any development that is planned, pending, or proposed. The following is a list of new and future development for the city of Oriska.

#### New

- Two new single-family homes were constructed.
- One new commercial building/shop was constructed.
- The public school was closed.

#### Future

- Retrofitting/upgrading of the lagoon system is desired.
- A new fire hall is desired,
- A new pump house for drinking/potable water is desired.

### **Buildings, Critical Facilities and Infrastructure, and Services and Utilities Provided**

The following section profiles the housing units, services, emergency response services, jurisdictional buildings, and utilities of the city of Oriska. Tables 3.10 to 3.13 in Chapter 3, Profile and Inventory show a complete inventory of this information for Barnes County and incorporated jurisdictions. An “X” indicates if the jurisdiction offers the utility or service (either through contract or employees) or possesses the building or resource. Narratives detailing information for the county and incorporated jurisdictions accompany each table.

Structures. Housing units show where populations are located. Table 3.9 in Chapter 3, Profile and Inventory shows the number of single-family, mobile home structures, and multifamily and in Barnes County and incorporated jurisdictions. The following are key points for the city of Oriska:

- There are 52 single-family housing units comprising 88.1 percent of all housing units in the city of Oriska.
- There are seven Mobile/Boat/RV/Van homes comprising the remaining 11.9 percent of all housing units in the city of Oriska

Critical Facilities. The following facilities were identified as critical in the city of Oriska.

- Former Oriska Elementary School (also serves as the community center, storm shelter, and community library).
- Oriska Fire Hall.
- St. Bernard Catholic Church (serves as a storm shelter)

Infrastructure. The following infrastructure was identified as critical in the city of Oriska.

- The city of Oriska has a sanitary sewer system with two lagoon cells and a lift station. There are no septic systems in the city of Oriska.
- The city of Oriska is located at the intersection of Interstate 94 and N.D. Highway 32.
- BNSF Railway.

Emergency Response Services. The following emergency response services were identified in the city of Oriska.

- Barnes County Ambulance provides ambulance services to the city of Oriska.
- The Oriska Fire Department provide fire protection to the city and surrounding area.
- The Barnes County Sherriff's Office provides law enforcement services to the city of Oriska.
- There are no first responders in the city.
- The nearest hospital is CHI-Mercy Hospital in Valley City.
- City-County Health District is in the city of Valley City and provides public health services to the city of Oriska.

Services and Utilities. The following services are provided in the city of Oriska.

- Waste Management provides garbage collection services to the city of Oriska.
- The city of Oriska maintains an inert landfill.
- The city of Oriska has a sanitary sewer system with two lagoon cells and a lift station. There are no septic systems in the city of Oriska.
- The city has a storm water system consisting of drainage ditches.
- The Valley City Times-Record is the official newspaper of the city of Oriska.
- Barnes Rural Water District provides drinking/potable water to the city of Oriska.
- Electricity is provided by Otter Tail Power.
- Natural gas is provided by MDU.
- Fuel oil, propane, and electricity are used as an alternative heating source and is provided by companies chosen by the individual consumer.
- BEK and Midcontinent provides phone and internet.

### 8.7.2 Risk Assessment and Hazard Scoring Notes

Table 8.7.2 summarizes the risk assessment scoring of the city of Oriska. The risk assessment and hazard scoring notes for each hazard specific to the city are shown in Table 8.7.3. Risk assessment notes for impact, frequency, likelihood and vulnerability ubiquitous for jurisdictions in Barnes County are found in Chapter 4, Threat and Hazard Identification Assessment in each respective hazard profile.

**Table 8.7.2 – City of Oriska Jurisdiction Risk Assessment Scoring Summary**

<b>Risk Assessment</b>							<b>Jurisdiction: City of Oriska</b>						
<b><u>Natural Hazard</u></b>	<b><u>Impact</u></b>	<b><u>Frequency</u></b>	<b><u>Likelihood</u></b>	<b><u>Vulnerability</u></b>	<b><u>Capabilities</u></b>	<b><u>Total</u></b>							
Drought	4	2	3	2	2	9							
Fire – Urban/Structure Collapse	2	3	3	3	1	10							
Fire – Wildland (Rural)	4	2	2	2	2	8							
Flood	3	3	4	4	2	12							
Geologic Hazard													
Infectious Disease	2	2	4	4	1	11							
Severe Summer Weather	3	3	4	3	2	11							
Severe Winter Weather	3	4	4	3	3	11							
Space Weather	4	1	2	3	1	9							
<b><u>Adversarial Threats</u></b>													
Civil Disturbance	2	2	2	2	1	7							
Criminal, Terrorist or Nation-State Attack	2	2	2	2	1	7							
Cyberattack	4	1	2	2	1	8							
<b><u>Technological Threats</u></b>													
Dam Failure	NA	NA	NA	NA	NA	NA							
Hazardous Material Release	4	1	4	4	1	12							
Transportation Incident	4	2	3	3	2	10							

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 8.7.3 – City of Oriska Jurisdiction Risk Assessment

	<b>Civil Disturbance</b>	
<b>Impact</b>	<ul style="list-style-type: none"> <li>Blocked Roads</li> <li>Business Interruptions</li> <li>Delayed Emergency Response</li> <li>Financial Hardship/Strain (public)</li> </ul>	<ul style="list-style-type: none"> <li>HAZMAT Release – oil trains and natural gas pipeline</li> <li>Human Injury/Death</li> <li>Property Damage (Structure)</li> <li>Property Damage (Vehicle)</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>Never an occurrence of a major incident</li> </ul>	<ul style="list-style-type: none"> <li>DAPL protesters were not active in the city</li> </ul>
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> <li>Presence of railroad infrastructure</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No pipelines</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> <li>Presence of railroad infrastructure</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No pipelines</li> </ul>

Table 8.7.3 – City of Oriska Jurisdiction Risk Assessment – Continued

Criminal, Terrorist, Nation-State Attack			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> <li>• Human Injury/Death</li> <li>• Property Damage (Structure)</li> <li>• Property Damage (Vehicle)</li> </ul> <ul style="list-style-type: none"> <li>• <b>Threats to city water supply</b></li> <li>• Mass Casualties/Fatalities</li> <li>• Loss of Communication Systems</li> <li>• Disease Outbreak/Mass Infections</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No occurrences</li> <li>• Miscellaneous property damage occurring in the city on an occasional basis</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• No railroad infrastructure</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• No railroad infrastructure</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>
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<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• No railroad infrastructure</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• No railroad infrastructure</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>
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Table 8.7.3 – City of Oriska Jurisdiction Risk Assessment – Continued

	Cyberattack	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> </ul>	<ul style="list-style-type: none"> <li>• Human Injury/Death</li> <li>• School Closure</li> <li>• <b>Loss of Communication Systems</b></li> <li>• Identity Theft – loss of wages and/or assets</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never an occurrence of a major attack</li> </ul>	
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Presence of railroad infrastructure</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No pipelines</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Elderly population relying largely on landlines for communication purposes, remote medical care and equipment monitoring</li> <li>• Presence of railroad infrastructure</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No pipelines</li> </ul>



Table 8.7.3 – City of Oriska Jurisdiction Risk Assessment - Continued

Drought	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Loss of Economy</li> <li>• Loss of Livestock</li> <li>• Loss of Wildlife Habitat (decreased wildlife populations)</li> <li>• Increase in Wildland Fire Potential</li> </ul> <ul style="list-style-type: none"> <li>• Water quality compromised from stock dams</li> <li>• Diminished soil quality – salinity will increase</li> <li>• Negative impact on mental health of producers and fire responders – “community impact”</li> <li>• Local producers forced to sell off herds which can last for several years</li> <li>• Population loss as people moved away due to loss of economy</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Severe Drought of 1961/1962, 1988/1989 to 1991/1992</li> <li>• Summer of 2017, local producers forced to sell off portions of their herds</li> </ul> <ul style="list-style-type: none"> <li>• End of July through winter of 2016 – county reached severe drought status</li> <li>• Severe drought in summer/fall of 2020</li> </ul>
<b>Likelihood</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Dry/wet cycle every five to eight years</li> <li>• Climatic patterns will result in an eventual drought of significance</li> <li>• Lack of precipitation</li> </ul> </div> <div style="width: 45%;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Heavy precipitation</li> </ul> </div> </div>
<b>Vulnerability</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Wildlife &amp; hunting economy</li> <li>• Agriculture economy</li> <li>• Elderly population</li> <li>• Flat terrain/open topography contributes to conditions</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• City does not have a water tower</li> <li>• City does not have a fire index sign</li> </ul> </div> <div style="width: 45%;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Financial assistance programs made available by the state and federal government</li> <li>• Burn Ban by county emergency management</li> <li>• Fire Index monitoring and mapping from NDDDES</li> <li>• Advanced communications such as internet and TV</li> <li>• Underground 10,000-gallon tank of backup water</li> <li>• Drinking/potable water received from Barnes Rural Water District</li> </ul> </div> </div>

Table 8.7.3 – City of Oriska Jurisdiction Risk Assessment - Continued

Fire – Urban Fire/Structure Collapse			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• HAZMAT Release</li> </ul> <ul style="list-style-type: none"> <li>• Human Injury/Death</li> <li>• Increase Fire Potential</li> <li>• Property damage on a significant scale if impacting downtown structures</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Occurrences of structures/vehicles being impacted every five years</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Age of structures on main street</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• Railroad infrastructure traversing city limits</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Adopted building codes</li> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Age of structures on main street</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• Railroad infrastructure traversing city limits</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Adopted building codes</li> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> </ul>
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Table 8.7.3 – City of Oriska Jurisdiction Risk Assessment – Continued

Fire – Rural & Wildland			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Crop Loss</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• Increase Fire Potential</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Mass Casualties</li> <li>• Losses could be on a significant scale if impacting a major producer or farmstead</li> <li>• Loss of farm equipment and assets</li> <li>• Loss of Livestock</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Significant fire once every five years</li> <li>• Controlled burns becoming out of control approximately 20 percent of the time</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> <li>• Railroad infrastructure traversing through city limits</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> <li>• Railroad infrastructure traversing through city limits</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> </ul>
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<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> <li>• Large fire district – strained coverage/resources</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of fire breaks around city limits</li> <li>• Lack of communication from fire department</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Removal of CRP</li> <li>• Summer and winter weather with heavy precipitation</li> <li>• MOUs with neighboring fire departments</li> <li>• Burn bans by county emergency management for areas outside city limits</li> <li>• Underground 10,000-gallon tank of backup water</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> <li>• Large fire district – strained coverage/resources</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of fire breaks around city limits</li> <li>• Lack of communication from fire department</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Removal of CRP</li> <li>• Summer and winter weather with heavy precipitation</li> <li>• MOUs with neighboring fire departments</li> <li>• Burn bans by county emergency management for areas outside city limits</li> <li>• Underground 10,000-gallon tank of backup water</li> </ul>
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Table 8.7.3 – City of Oriska Jurisdiction Risk Assessment – Continued

Flood			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• <b>Blocked Roads:</b> 8<sup>th</sup> Ave and 126<sup>th</sup> Ave SE</li> <li>• Delayed Emergency Response</li> <li>• Flooding (Highway &amp; Structure)</li> <li>• Human Injury/Death</li> <li>• Property Damage / Sewer Backup</li> <li>• Runoff from buildings causes overland flooding</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Heavy spring melting to heavy rains occurs yearly</li> <li>• Drainage of farmland may increase likelihood</li> <li>• Flash flooding occurs from heavy precipitation</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Dry seasons and low precipitation</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Dry seasons and low precipitation</li> </ul>
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<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> <li>• Local topography of the city with closed basins</li> <li>• City is not enrolled in the NFIP</li> <li>• City does not have flood ordinances</li> <li>• City lacks proper storm water drainage system</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Alternate routes were identified for townships roads</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> <li>• Local topography of the city with closed basins</li> <li>• City is not enrolled in the NFIP</li> <li>• City does not have flood ordinances</li> <li>• City lacks proper storm water drainage system</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Alternate routes were identified for townships roads</li> </ul>
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Table 8.7.3 – City of Oriska Jurisdiction Risk Assessment – Continued

	<b>Geologic Hazard</b>	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Delayed Emergency Response</li> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of Power</li> <li>• Property Damage</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No incidents involving geologic hazards in or near city limits</li> </ul>	
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul>

Table 8.7.3 – City of Oriska Jurisdiction Risk Assessment – Continued

Hazardous Material Release			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Delayed Emergency Response / Increased Fire Potential</li> <li>• Environmental Degradation</li> <li>• Evacuation (localized)</li> <li>• Explosion</li> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> <li>• Loss of Potable Water</li> <li>• Loss of Power</li> <li>• Property Damage</li> <li>• Increased risk of HAZMAT release and/or transportation incidents due to increased oil train traffic and trucks</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Small incidents of leaking anhydrous tanks bi-annually</li> <li>• Never any major spills reported</li> <li>• Never a pipeline leak</li> <li>• Presence of oil trains</li> <li>• People do not have propane tanks in town on their properties for heating</li> <li>• More chemicals being stored in the area by farmers on their properties</li> <li>• Trucks transporting equipment have larger tanks, carrying more chemicals</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines nearby</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• City located near Interstate 94</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> <li>• Decrease in oil trains (from a frequency of one per hour) one the DAPL opened in 2017</li> </ul> </td> </tr> </table>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines nearby</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• City located near Interstate 94</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> <li>• Decrease in oil trains (from a frequency of one per hour) one the DAPL opened in 2017</li> </ul>
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<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Agriculture economy and related industries</li> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines nearby</li> <li>• No hospital or medical clinic in city limits</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• City located near Interstate 94</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Designated truck route in the city of Oriska</li> <li>• Fire departments have some HAZMAT training</li> <li>• Manual-activated emergency siren</li> </ul> </td> </tr> </table>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Agriculture economy and related industries</li> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines nearby</li> <li>• No hospital or medical clinic in city limits</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• City located near Interstate 94</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Designated truck route in the city of Oriska</li> <li>• Fire departments have some HAZMAT training</li> <li>• Manual-activated emergency siren</li> </ul>
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Table 8.7.3 – City of Oriska Jurisdiction Risk Assessment – Continued

	Infectious Disease	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Human Injury/Death</li> <li>• Livestock Loss</li> <li>• Loss of Economy</li> <li>• Mass Casualties</li> </ul>	<ul style="list-style-type: none"> <li>• Strain on local medical resources (ambulance)</li> <li>• Loss of medical staff due to sickness</li> <li>• Loss of Potable Water</li> <li>• Financial cost to public health resources</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Annual occurrences of death, primarily among the elderly</li> <li>• Occurrence of disease - 1 in 3 for people annually</li> <li>• Annual occurrences of influenza cases in the local population</li> </ul>	<ul style="list-style-type: none"> <li>• The COVID-19 Pandemic of 2020 resulted in mass quarantine and sheltering of the local population and temporary closure of businesses</li> </ul>
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• Dependent on weather for animals and crops</li> <li>• Transporting of animals across state lines</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• Transporting of animals across state lines</li> <li>• No hospital or medical clinic</li> <li>• No vet clinic in city limits</li> <li>• Abandoned properties</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> <li>• Immunizations &amp; medications of local population</li> <li>• No care center in the city</li> <li>• No public school</li> </ul>

Table 8.7.3 – City of Oriska Jurisdiction Risk Assessment – Continued

Severe Summer Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• <b>Blocked Roads from frost boils:</b> 6<sup>th</sup> Ave, intersection of 5<sup>th</sup> St. and 4<sup>th</sup> Ave, 3<sup>rd</sup> Ave between 5<sup>th</sup> St. and 6<sup>th</sup> St., and 2<sup>nd</sup> Ave between 5<sup>th</sup> St. and 6<sup>th</sup> St.</li> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – heat exhaustion</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> </ul> <ul style="list-style-type: none"> <li>• Vehicle Damage</li> <li>• Loss of Livestock</li> <li>• Loss of Crops</li> <li>• Loss of Power/Downed Power Lines -</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Heavy rain from time to time</li> <li>• Not much hail recently</li> <li>• Couple high winds and strong storms per summer season</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at fire hall and lift station</li> <li>• Lack of building code enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• City located near Interstate 94</li> <li>• Lift station in low-lying area</li> <li>• City lacks proper storm water drainage system</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> <li>• City has two shelters</li> </ul> </td> </tr> </table>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at fire hall and lift station</li> <li>• Lack of building code enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• City located near Interstate 94</li> <li>• Lift station in low-lying area</li> <li>• City lacks proper storm water drainage system</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> <li>• City has two shelters</li> </ul>
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Table 8.7.3 – City of Oriska Jurisdiction Risk Assessment – Continued

Severe Winter Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• <u>Blocked Roads</u>: 8<sup>th</sup> Ave, 5<sup>th</sup> St. and 6<sup>th</sup> Ave, 3<sup>rd</sup> Ave, 4<sup>th</sup> St. and 5<sup>th</sup> St.</li> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – wind chill</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> </ul> <ul style="list-style-type: none"> <li>• Loss of Crops</li> <li>• Loss of Livestock</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> <li>• Vehicle Damage</li> <li>• Infrastructure Degradation</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• March 2017 snowstorm resulted in blocked roads throughout the city</li> <li>• Spring snowstorm of 2019</li> <li>• Annual occurrences of power loss from storms</li> <li>• Two or three significant blizzards producing damage to trees and property annually</li> </ul> <ul style="list-style-type: none"> <li>• Removal of shelter belts and vegetation leads to more ground blizzard conditions</li> <li>• In 1997, no power for six days to a week after snow/ice storm</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at city fire hall and lift station</li> <li>• Lack of building code enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• City located near Interstate 94</li> <li>• City lacks proper storm water drainage system</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> </ul> </td> </tr> </table>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at city fire hall and lift station</li> <li>• Lack of building code enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• City located near Interstate 94</li> <li>• City lacks proper storm water drainage system</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> </ul>
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Table 8.7.3 – City of Oriska Jurisdiction Risk Assessment – Continued

Space Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Loss of operation of the city hall, fire hall, lift station, etc.</li> <li>• Loss/outage of medical devices at private residences</li> <li>• Property damage from sewer backups due to loss of lift station</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never a recorded occurrence in Barnes County or North Dakota</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Dependent on solar activity and the 11-year solar cycle</li> <li>• Likely to occur once every 500 years per the 2018 N.D. Enhanced Mitigation MAOP</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> <li>• Lack of permanent generator at city fire hall and lift station</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> <li>• City Auditor’s Office conducts business on paper and maintains hard copy records</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> <li>• Lack of permanent generator at city fire hall and lift station</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> <li>• City Auditor’s Office conducts business on paper and maintains hard copy records</li> </ul>
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Table 8.7.3 – City of Oriska Jurisdiction Risk Assessment – Continued

	Transportation Incident	
<b>Impact</b>	<ul style="list-style-type: none"> <li>Blocked roads from inadequate road clearing</li> <li>Human Injury/Death</li> <li>Increased Fire Potential</li> <li>Loss of Transportation/Accessibility</li> <li>Mass Casualties/Fatalities</li> </ul>	<ul style="list-style-type: none"> <li>Delayed Emergency Response</li> <li>HAZMAT Release</li> <li>Livestock Loss</li> <li>Business Interruptions</li> <li>Property Damage</li> <li>Could be catastrophic if involving a school bus filled with children and a truck carrying hazardous materials</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>Annual occurrences of accidents involving cars and/or farm equipment</li> </ul>	
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Intoxicated drivers</li> <li>High truck traffic from agriculture-related traffic</li> <li>Railroad infrastructure traversing through city limits</li> <li>City located near Interstate 94</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>No commercial passenger airport</li> <li>Decrease in oil trains (from a frequency of one per hour) one the DAPL opened in 2017</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Intoxicated drivers</li> <li>High truck traffic from agriculture-related traffic</li> <li>No hospital or medical clinic</li> <li>Railroad infrastructure traversing through city limits</li> <li>City located near Interstate 94</li> <li>Lack of grade-separated crossing with the railroad</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>No commercial passenger airport</li> <li>Presence of designated truck routes through city limits</li> </ul>

### 8.7.3 Mitigation Strategy

The Barnes County Multi-Jurisdictional Multi-Hazard Plan Update includes a mitigation strategy consisting of seven goals in Chapter 6. The following problem statement and mitigation projects address the mitigation needs of the city of Oriska. It should be noted that some mitigation projects that pertain to all jurisdictions are included to encourage county-wide collaboration.

#### **Problem Statement**

The city of Oriska is vulnerable to floods and severe summer weather as heavy rain causes overland flooding and impacts critical facilities and infrastructure. Flooding occurs most frequently on city streets near the city park. The city does not have a storm water drainage system further contributing to flooding and drainage issues. The city has a manually-activated emergency siren. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Improved drainage, installation of generators at critical facilities and infrastructure, and upgrading of the outdoor emergency siren are a priority for the city.

**City of Oriska Project 1: Install permanent generators at critical facilities and infrastructure.**

Description/Benefit		Test existing generators and create regularly scheduled maintenance system. Install new generators to establish permanent source of backup power to maintain continued operation of the following critical facilities and infrastructure.  <u>Install New</u> <ul style="list-style-type: none"> <li>• Oriska Fire Hall</li> <li>• Lift station</li> <li>• Former Oriska Elementary School (serves as community center, shelter, recreation center, and community library)</li> <li>• Holy Trinity Church (shelter)</li> </ul>					
Hazards Addressed		All hazards					
Affected Jurisdiction(s)		City of Oriska					
Project Status		New/Ongoing and Continue					
Priority		High					
Responsible Agency		City Council, Public Works, Emergency Services, Maple Valley Public School District					
Partners		Emergency Management, Public Utilities					
Completion Timeframe		2 to 3 years			Cost	Project-specific	
Funding Source		Public Utilities, Regional Council, RD. FEMA Pre-Disaster Mitigation Grant Program (PDM). State Homeland Security grants. Maple Valley Public School District.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>			<u>Plan Element Utilized</u>			<u>Process for Integration</u>	
Barnes County LEOP & Mitigation Plan Barnes County THIRA			Capability Assessment, Hazard History, Risk Assessment			Include in city and/or fire department's budget. Apply for grant funding or purchase directly using existing sales tax revenue or budgets. Approval city council or board.	

**City of Oriska Project 2: Upgrade manually-activated outdoor emergency siren.**

Description/Benefit		The city’s outdoor emergency siren is manually activated and needs to be upgraded to provide radio-activation/dispatch-activation.					
Hazards Addressed		All					
Affected Jurisdiction(s)		City of Oriska					
Project Status		Ongoing and Continue					
Priority		High					
Responsible Agency		City Council, Emergency Services					
Partners		County Commission, Emergency Management, NDAC, NDLC, Regional Council					
Completion Timeframe		2 to 3 years	Cost	Up to \$25,000 per siren			
Funding Source		Local budgets. N.D. League of Cities. State Homeland Security Grants. NDDDES.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Include in city and/or fire department’s capital improvement plan. Apply for grant funding or purchase directly using existing sales tax revenue or budgets. Approval city council or board.		

**City of Oriska Project 3: Conduct engineering study to identify solutions to establish permanent drainage and subsequent maintenance.**

Description/Benefit	Poor drainage at the city park, other low-lying areas, and one private residence by N.D. Highway 32. Reduction of damage to critical facilities and infrastructure from annual flooding to assure access for emergency services and continued operation of public infrastructure. Reduce or eliminate damage to people’s homes. Maintain flow of runoff to eliminate standing water blocking roads to maintain access for city residents and emergency services and continued operation of public infrastructure. Control growth of vegetation to minimize fire hazard, spread of disease, and severe weather impacts.		
Hazards Addressed	Flood, Infectious Disease, Severe Summer Weather, Severe Winter Weather		
Affected Jurisdiction(s)	City of Oriska		
Project Status	New/Ongoing and Continue		
Priority	High		
Responsible Agency	City Council, Public Works		
Partners	County Commission, NDAC, NDLC, Regional Council, private contractors, DWR		
Completion Timeframe	2 to 3 years	Cost	Project-specific
Funding Source	Local budgets. N.D. League of Cities. DWR.		

**Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)**

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	3	5	5	32

**Integration of Mitigation Plan Requirements into Local Planning Mechanisms**

<u>Planning Mechanisms Utilized</u>	<u>Plan Element</u>	<u>Process for Integration</u>
Barnes County LEOP & Mitigation Plan Barnes County THIRA	Capability Assessment, Hazard History, Risk Assessment	City solicits three engineering proposals from qualified firms. Select appropriate firm based on proposals. Apply for grant funding. Execute project. Submit reimbursements and close-out grant.

### 8.7.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: administrative and technical, education and outreach, financial, and planning and regulatory. Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. **Tables comparing the mitigation capabilities of the city of Oriska with all other jurisdictions in Barnes County can be found below and in Chapter 7, County Mitigation Capability Assessment.**

- Administrative and Technical: Identification of administrative and technical capabilities, which include staff, their skills and tools for mitigation planning to implement specific mitigation actions.
- Education and Outreach: Identification of education and outreach programs, and methods already in place to implement mitigation activities and communicate hazard-related information.
- Financial: Identification of access to or eligibility to use funding resources for hazard mitigation for jurisdictions.
- Planning and Regulatory: Jurisdictional plans, policies, codes, and ordinances adopted and in place that prevent and reduce the impacts of hazards.

#### City of Oriska Mitigation Capabilities

Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. Information on the capabilities of the city was gathered at its jurisdictional meeting, committee meetings, and interviews during the planning process.

#### Administrative and Technical

The following narrative details the administrative and technical capabilities of the city of Oriska.

The city of Oriska has an active city council. The city does not have a chief building official or inspector. The city participates in the County LEPC. The city does not have a civil engineer on staff, but can contract with a private firm for engineering services when needed. The county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning services, grant writing and grant administration services. However, the city council and auditor have experience in grant writing and administration. The mayor can also assist in administration. The city does not have any infrastructure maintenance programs, but conducts maintenance on an as-needed basis. The city is part of the county-wide mutual aid agreement for emergency services. The city has an emergency siren located on top of the fire hall, but it is not adequate as it is manually activated. The city does not have any generators. The fire ISO rating for the city is nine. The city does not have a fire index sign. Emergency services are not GIS capable. However, city staff have smart phones and assist emergency services when needed. The city auditor reports hazard data to the emergency manager. The city does not have Firewise or StormReady Certification.



### **Education and Outreach**

The following narrative details the education and outreach capabilities of the city of Oriska.

The city does not have non-profit organizations providing education on hazards, but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. Fire prevention week is conducted at the elementary school on an annual basis in October by the Oriska Fire Department. The city also has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

### **Financial**

The following narrative details the financial capabilities of the city of Oriska.

The city has a general fund and savings account that can help pay for infrastructure projects, but does not maintain an account specifically for infrastructure projects. The city does not assess a storm water utility fee as it lacks a storm water system. The city does not charge a sanitary sewer fee despite having a sanitary sewer system. The city does not levy special assessments for new development, but has the ability to do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also has the ability to do so if warranted. The city issues building permits for \$5. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

### **Planning and Regulatory**

The following narrative details the planning and regulatory capabilities of the city of Oriska.

The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning, subdivision ordinances or impact fees. The city issues building permits. The city council serves as the planning commission for the city. The city adopted the state building codes, but does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study, but does have a flood insurance study. However, the city is considering flood ordinances to address overland flooding issues. The city is covered under the County's Pandemic Influenza Response Plan.

### **8.7.5 Integration of Mitigation Plan into Planning Mechanisms**

Integration of the plan into current planning mechanisms is critical in mitigation to communicate the needs of each jurisdiction to achieve an all-inclusive mitigation strategy. The process for integration of the mitigation plan is included after each mitigation project, which shows the planning mechanism utilized, the plan element used for integration and the process for integration.

### **8.7.6 Plan Maintenance**

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.

## 8.8 City of Pillsbury, North Dakota

The following profile includes information specific to the city of Pillsbury for mitigation planning purposes. The information included is as follows:

- Profile and Inventory;
- Risk Assessment;
- Hazard Scoring Notes;
- Mitigation Projects, and
- Capabilities for Mitigation.

### **Integration into Planning Mechanisms**

The process for integration of the mitigation plan into existing planning mechanisms is discussed at the bottom of each mitigation project in section 8.8.3, in section 8.8.4, and in Chapter 6, Mitigation Strategy.

### **Plan Maintenance**

Plan maintenance is shown in section 8.8.6.

### **Critical Facilities and Infrastructure**

Figure 8.8.1 is a map of the city of Pillsbury provided by Barnes County Emergency Management.

Figure 8.8.1 – City of Pillsbury, North Dakota



Source(s): Barnes County Emergency Management

### 8.8.1 Profile and Inventory

The location, total population, vulnerable populations, housing units and household size, businesses, critical facilities and infrastructure, new and future development, services, jurisdictional buildings, emergency response services and utilities are shown for the city of Pillsbury. Detailed narratives follow each section heading to profile the city.

Detailed information on public buildings, services provided, emergency response services and utilities can be found in Chapter 3, Profile and Inventory.

#### Location

The city of Pillsbury is located on N.D. Highway 32, approximately 30 miles north-northeast of Valley City in Barnes County.

#### Population

Table 8.8.1 shows population trends for the city of Pillsbury from 1920 to 2010, with an estimate for 2019.

Per the 2010 U.S. Decennial Census, the city of Pillsbury has a population of 12 people, which is a decrease of 12 people (50.0 percent) from 24 people in 2000.

**Table 8.8.1 – 1920 to 2010 City of Pillsbury, North Dakota Population Statistics**

1920	1930	1940	1950	1960	1970	1980	1990	2000	2010	2019 (est.)
142	260	161	119	76	50	46	31	24	12	12

Source(s): U.S. Decennial Census; American Community Survey, 5-Year Estimates

#### Vulnerable Populations

Age. Per the 2015 to 2019 American Community Survey 5-Year Estimate, the population of the city of Pillsbury consists of no individuals under the age of 20 and 12 individuals aged 65 and older.

Daycares. There are no daycares in the city of Pillsbury.

Poverty. Per the 2015 to 2019 American Community Survey 5-Year Estimate, there is one household in the city of Pillsbury that live below the poverty line.

Public Schools. There is not a public school in the city of Pillsbury. The school closed in 1972.

Senior Housing Developments/Care Centers. There are no age-restricted, senior housing developments, or care centers in the city of Pillsbury.

#### Housing Units and Household Size

The 2015 to 2019 American Community Survey 5-Year Estimate shows there is a total of eight housing units in the city consisting entirely of single-family homes.

The 2015 to 2019 American Community Survey 5-Year Estimate shows there are eight households in the city of Pillsbury resulting in an average household size of 1.88 people.

### **Businesses**

There are no major employers in the city of Pillsbury. Additional information on businesses and economic development in the city of Pillsbury or can be obtained by contacting the Valley City-Barnes County Development Group.

### **New and Future Development**

New development is considered any development occurring since the 2015 Barnes County Multi-Hazard Mitigation Plan. Future development is considered any development that is planned, pending, or proposed. No new and future development was identified at the time of this plan update.

### **Buildings, Critical Facilities and Infrastructure, and Services and Utilities Provided**

The following section profiles the housing units, services, emergency response services, jurisdictional buildings, and utilities of the city of Pillsbury. Tables 3.10 to 3.13 in Chapter 3, Profile and Inventory show a complete inventory of this information for Barnes County and incorporated jurisdictions. An “X” indicates if the jurisdiction offers the utility or service (either through contract or employees) or possesses the building or resource. Narratives detailing information for the county and incorporated jurisdictions accompany each table.

Structures. Housing units show where populations are located. Table 3.9 in Chapter 3, Profile and Inventory shows the number of single-family, mobile home structures, and multifamily and in Barnes County and incorporated jurisdictions. The following are key points for the city of Pillsbury:

- There are eight single-family housing units comprising 100.0 percent of all housing units in the city of Pillsbury.
- There are no Mobile/Boat/RV/Van homes or Multifamily housing units in the city of Pillsbury.

Critical Facilities. The following facilities were identified as critical in the city of Pillsbury.

- There are no critical facilities in the city of Pillsbury.

Infrastructure. The following infrastructure was identified as critical in the city of Pillsbury.

- The city of Pillsbury does not have a sanitary sewer system. Residents utilize septic systems.
- The city of Pillsbury is located on N.D. Highway 32.

Emergency Response Services. The following emergency response services were identified in the city of Pillsbury.

- Barnes County Ambulance provides ambulance services to the city of Pillsbury.
- The Hope Fire Department and District in neighboring Steele County provides fire protection and first responders to the city and surrounding areas.
- The Barnes County Sheriff's Office provides law enforcement services to the city of Pillsbury.
- The city are no first responders in the city.
- The nearest hospital is CHI-Mercy Hospital in Valley City.

- City-County Health District is in the city of Valley City and provides public health services to the city of Pillsbury.

Services and Utilities. The following services are provided in the city of Pillsbury.

- Brager Disposal, Inc. provides garbage collection services to the city of Pillsbury.
- The city of Pillsbury does not maintain an inert landfill.
- The city of Pillsbury does not have a sanitary sewer system. Residents utilize septic systems.
- The city has a storm water system consisting of drainage ditches.
- The Valley City Times-Record is the official newspaper of the city of Pillsbury.
- Dakota Rural Water District provides drinking/potable water to the city of Pillsbury.
- Electricity is provided by Otter Tail Power.
- Natural gas is not available in the city of Pillsbury.
- Fuel oil, propane, and electricity are used as an alternative heating source and is provided by companies chosen by the individual consumer.
- BEK provides phone and internet.

**8.8.2 Risk Assessment and Hazard Scoring Notes**

Table 8.8.2 summarizes the risk assessment scoring of the city of Pillsbury. The risk assessment and hazard scoring notes for each hazard specific to the city are shown in Table 8.8.3. Risk assessment notes for impact, frequency, likelihood and vulnerability ubiquitous for jurisdictions in Barnes County are found in Chapter 4, Threat and Hazard Identification Assessment in each respective hazard profile.

**Table 8.8.2 – City of Pillsbury Jurisdiction Risk Assessment Scoring Summary**

<b>Risk Assessment</b>							<b>Jurisdiction: City of Pillsbury</b>						
<b><u>Natural Hazard</u></b>	<b><u>Impact</u></b>	<b><u>Frequency</u></b>	<b><u>Likelihood</u></b>	<b><u>Vulnerability</u></b>	<b><u>Capabilities</u></b>	<b><u>Total</u></b>							
Drought													
Fire – Urban/Structure Collapse													
Fire – Wildland (Rural)													
Flood													
Geologic Hazard	NA	NA	NA	NA	NA	NA							
Infectious Disease													
Severe Summer Weather													
Severe Winter Weather													
Space Weather													
<b><u>Adversarial Threats</u></b>													
Civil Disturbance													
Criminal, Terrorist or Nation-State Attack													
Cyberattack	4	1	2	3	1	9							
<b><u>Technological Threats</u></b>													
Dam Failure	NA	NA	NA	NA	NA	NA							
Hazardous Material Release													
Transportation Incident													

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)



Table 8.8.3 – City of Pillsbury Jurisdiction Risk Assessment

	<b>Civil Disturbance</b>	
<b>Impact</b>	<ul style="list-style-type: none"> <li>Blocked Roads</li> <li>Business Interruptions</li> <li>Delayed Emergency Response</li> <li>Financial Hardship/Strain (public)</li> </ul>	<ul style="list-style-type: none"> <li>HAZMAT Release – oil trains and natural gas pipeline</li> <li>Human Injury/Death</li> <li>Property Damage (Structure)</li> <li>Property Damage (Vehicle)</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>Never an occurrence of a major incident</li> </ul>	<ul style="list-style-type: none"> <li>DAPL protesters were not active in the city</li> </ul>
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> <li>Presence of railroad infrastructure</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No pipelines</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> <li>Presence of railroad infrastructure</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No pipelines</li> </ul>

Table 8.8.3 – City of Pillsbury Jurisdiction Risk Assessment – Continued

Criminal, Terrorist, Nation-State Attack			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> <li>• Human Injury/Death</li> <li>• Property Damage (Structure)</li> <li>• Property Damage (Vehicle)</li> </ul> <ul style="list-style-type: none"> <li>• <b>Threats to city water supply</b></li> <li>• Mass Casualties/Fatalities</li> <li>• Loss of Communication Systems</li> <li>• Disease Outbreak/Mass Infections</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No occurrences</li> <li>• Miscellaneous property damage occurring in the city on an occasional basis</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>
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<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>
<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>		

Table 8.8.3 – City of Pillsbury Jurisdiction Risk Assessment – Continued

	Cyberattack	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> </ul>	<ul style="list-style-type: none"> <li>• Human Injury/Death</li> <li>• School Closure</li> <li>• <b>Loss of Communication Systems</b></li> <li>• Identity Theft – loss of wages and/or assets</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never an occurrence of a major attack</li> </ul>	
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Presence of railroad infrastructure</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No pipelines</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Elderly population relying largely on landlines for communication purposes, remote medical care and equipment monitoring</li> <li>• Presence of railroad infrastructure</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No pipelines</li> </ul>

Table 8.9.3 – City of Pillsbury Jurisdiction Risk Assessment - Continued

	Drought	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Loss of Economy</li> <li>• Loss of Livestock</li> <li>• Loss of Wildlife Habitat (decreased wildlife populations)</li> <li>• Increase in Wildland Fire Potential</li> </ul>	<ul style="list-style-type: none"> <li>• Water quality compromised from stock dams</li> <li>• Diminished soil quality – salinity will increase</li> <li>• Negative impact on mental health of producers and fire responders – “community impact”</li> <li>• Local producers forced to sell off herds which can last for several years</li> <li>• Population loss as people moved away due to loss of economy</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Severe Drought of 1961/1962, 1988/1989 to 1991/1992</li> <li>• Summer of 2017, local producers forced to sell off portions of their herds</li> </ul>	<ul style="list-style-type: none"> <li>• End of July through winter of 2016 – county reached severe drought status</li> <li>• Severe drought in summer/fall of 2020</li> </ul>
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Dry/wet cycle every five to eight years</li> <li>• Climatic patterns will result in an eventual drought of significance</li> <li>• Lack of precipitation</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Heavy precipitation</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Wildlife &amp; hunting economy</li> <li>• Agriculture economy</li> <li>• Elderly population</li> <li>• Flat terrain/open topography contributes to conditions</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• City does not have a fire index sign</li> <li>• Sloughs by railroad tracks-never mowed and could become start and spread if the wind is right</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Financial assistance programs made available by the state and federal government</li> <li>• Burn Ban by county emergency management</li> <li>• Fire Index monitoring and mapping from NDDDES</li> <li>• Advanced communications such as internet and TV</li> <li>• City received drinking/potable water from Barnes Rural Water District</li> </ul>

Table 8.9.3 – City of Pillsbury Jurisdiction Risk Assessment - Continued

Fire – Urban Fire/Structure Collapse			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• HAZMAT Release</li> </ul> <ul style="list-style-type: none"> <li>• Human Injury/Death</li> <li>• Increase Fire Potential</li> <li>• Property damage on a significant scale if impacting downtown structures</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Occurrences of structures/vehicles being impacted every five years</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• Railroad infrastructure traversing city limits</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• Railroad infrastructure traversing city limits</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> </ul>
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<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Age of structures</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• Prolonged response times due to limited fire staff during the daytime</li> <li>• Railroad infrastructure traversing city limits</li> <li>• Lack of building codes and enforcement</li> <li>• No fire department</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Age of structures</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• Prolonged response times due to limited fire staff during the daytime</li> <li>• Railroad infrastructure traversing city limits</li> <li>• Lack of building codes and enforcement</li> <li>• No fire department</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> </ul>
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Table 8.9.3 – City of Pillsbury Jurisdiction Risk Assessment – Continued

Fire – Rural & Wildland			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Crop Loss</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• Increase Fire Potential</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Mass Casualties</li> <li>• Losses could be on a significant scale if impacting a major producer or farmstead</li> <li>• Loss of farm equipment and assets</li> <li>• Loss of Livestock</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Significant fire once every five years</li> <li>• Approximately four wildland fires occurring annually</li> <li>• Controlled burns becoming out of control approximately 40 percent of the time</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> <li>• Railroad infrastructure traversing through city limits</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> <li>• Railroad infrastructure traversing through city limits</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> </ul>
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Table 8.9.3 – City of Pillsbury Jurisdiction Risk Assessment – Continued

Flood			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Delayed Emergency Response</li> <li>• Flooding (Highway &amp; Structure)</li> <li>• Human Injury/Death</li> <li>• Property Damage / Sewer Backup</li> <li>• Runoff from buildings causes overland flooding</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• When raining heavy, roads become blocked and is expected</li> <li>• Each year it occurs</li> <li>• Sump pumps are constantly running</li> <li>• Flash flooding occurs from heavy precipitation</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> <li>• City lacks proper storm water drainage system</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Dry seasons and low precipitation</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> <li>• City lacks proper storm water drainage system</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Dry seasons and low precipitation</li> </ul>
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Table 8.9.3 – City of Pillsbury Jurisdiction Risk Assessment – Continued

	Geologic Hazard	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Delayed Emergency Response</li> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of Power</li> <li>• Property Damage</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No incidents involving geologic hazards in or near city limits</li> </ul>	
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul>



Table 8.9.3 – City of Pillsbury Jurisdiction Risk Assessment – Continued

Hazardous Material Release			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Delayed Emergency Response / Increased Fire Potential</li> <li>• Environmental Degradation</li> <li>• Evacuation (localized)</li> <li>• Explosion</li> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> <li>• Loss of Potable Water</li> <li>• Loss of Power</li> <li>• Property Damage</li> <li>• Increased risk of HAZMAT release and/or transportation incidents due to increased oil train traffic and trucks</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Small incidents of leaking anhydrous tanks bi-annually</li> <li>• Never any major spills reported</li> <li>• Never a pipeline leak</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines near the city</li> <li>• Railroad infrastructure traversing through city limits</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> <li>• Decrease in oil trains (from a frequency of one per hour) one the DAPL opened in 2017</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines near the city</li> <li>• Railroad infrastructure traversing through city limits</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> <li>• Decrease in oil trains (from a frequency of one per hour) one the DAPL opened in 2017</li> </ul>
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Table 8.9.3 – City of Pillsbury Jurisdiction Risk Assessment – Continued

	Infectious Disease	
Impact	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Human Injury/Death</li> <li>• Livestock Loss</li> <li>• Loss of Economy</li> <li>• Mass Casualties</li> </ul>	<ul style="list-style-type: none"> <li>• Strain on local medical resources (ambulance)</li> <li>• Loss of medical staff due to sickness</li> <li>• Loss of Potable Water</li> <li>• Financial cost to public health resources</li> </ul>
Frequency	<ul style="list-style-type: none"> <li>• Annual occurrences of death, primarily among the elderly</li> <li>• Occurrence of disease - 1 in 3 for people annually</li> <li>• Annual occurrences of influenza cases in the local population</li> </ul>	<ul style="list-style-type: none"> <li>• The COVID-19 Pandemic of 2020 resulted in mass quarantine and sheltering of the local population and temporary closure of businesses</li> </ul>
Likelihood	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• Dependent on weather for animals and crops</li> <li>• Transporting of animals across state lines</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> </ul>
Vulnerability	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• Transporting of animals across state lines</li> <li>• No hospital or medical clinic</li> <li>• No vet clinic in city limits</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> <li>• Immunizations &amp; medications of local population</li> <li>• No care center in the city</li> <li>• No public school</li> <li>• Mowing of city lots and spray for mosquitos</li> </ul>

Table 8.9.3 – City of Pillsbury Jurisdiction Risk Assessment – Continued

Severe Summer Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• <b>Blocked Roads:</b> Corner of 1<sup>st</sup> by the old gas pump.</li> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – heat exhaustion</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> </ul> <ul style="list-style-type: none"> <li>• Vehicle Damage</li> <li>• Loss of Livestock</li> <li>• Loss of Crops</li> <li>• Loss of Power/Downed Power Lines -</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Heavy rain from time to time each summer</li> <li>• Not much hail recently</li> <li>• Couple high winds and strong storms per summer season</li> <li>• Straight line winds about 6 to 7 years ago-lots of trees blew down</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> <li>• Removal of tree rows allows for wind to impact city more directly</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of building codes and enforcement</li> <li>• No outdoor emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of storm water drainage system</li> <li>• Lack of a storm shelter</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• No public school</li> </ul> </td> </tr> </table>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of building codes and enforcement</li> <li>• No outdoor emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of storm water drainage system</li> <li>• Lack of a storm shelter</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• No public school</li> </ul>
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Table 8.9.3 – City of Pillsbury Jurisdiction Risk Assessment – Continued

Severe Winter Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• <b>Blocked Roads:</b> 3<sup>rd</sup> Avenue</li> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – wind chill</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> <li>• Loss of Crops</li> <li>• Loss of Livestock</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> <li>• Vehicle Damage</li> <li>• Infrastructure Degradation</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Happens yearly, weather and climate in the area</li> <li>• High winds and ground blizzard conditions-always blocks roads to N.D. Highway 1</li> <li>• March of 1997-whole county was out for 3 days up to a week-out for 2 weeks in Pillsbury</li> <li>• Four to five strong storms per season</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> <li>• Removal of shelter belts and vegetation leads to more ground blizzard conditions</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of building codes and enforcement</li> <li>• No outdoor emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of storm water drainage system</li> <li>• Lack of a storm shelter</li> <li>• 3<sup>rd</sup> Avenue becomes blocked each storm</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• No public school</li> </ul> </td> </tr> </table>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of building codes and enforcement</li> <li>• No outdoor emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of storm water drainage system</li> <li>• Lack of a storm shelter</li> <li>• 3<sup>rd</sup> Avenue becomes blocked each storm</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• No public school</li> </ul>
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Table 8.9.3 – City of Pillsbury Jurisdiction Risk Assessment – Continued

Space Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Loss of operation of the city hall, fire hall, lift station, etc.</li> <li>• Loss/outage of medical devices at private residences</li> <li>• Property damage from sewer backups due to loss of lift station</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never a recorded occurrence in Barnes County or North Dakota</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Dependent on solar activity and the 11-year solar cycle</li> <li>• Likely to occur once every 500 years per the 2018 N.D. Enhanced Mitigation MAOP</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> <li>• City Auditor’s Office conducts business on paper and maintains hard copy records</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> <li>• City Auditor’s Office conducts business on paper and maintains hard copy records</li> </ul>
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Table 8.9.3 – City of Pillsbury Jurisdiction Risk Assessment – Continued

	Transportation Incident	
Impact	<ul style="list-style-type: none"> <li>Blocked roads from inadequate road clearing</li> <li>Human Injury/Death</li> <li>Increased Fire Potential</li> <li>Loss of Transportation/Accessibility</li> <li>Mass Casualties/Fatalities</li> </ul>	<ul style="list-style-type: none"> <li>Delayed Emergency Response</li> <li>HAZMAT Release</li> <li>Livestock Loss</li> <li>Business Interruptions</li> <li>Property Damage</li> <li>Could be catastrophic if involving a school bus filled with children and a truck carrying hazardous materials</li> </ul>
Frequency	<ul style="list-style-type: none"> <li>Annual occurrences of accidents involving cars and/or farm equipment</li> </ul>	Nothing major in the area in recent years
Likelihood	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Intoxicated drivers</li> <li>High truck traffic from agriculture-related traffic</li> <li>Railroad infrastructure traversing through city limits</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>No commercial passenger airport</li> <li>Decrease in oil trains (from a frequency of one per hour) one the DAPL opened in 2017</li> </ul>
Vulnerability	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Intoxicated drivers</li> <li>High truck traffic from agriculture-related traffic</li> <li>No hospital or medical clinic</li> <li>Railroad infrastructure traversing through city limits</li> <li>Lack of paved streets</li> <li>Lack of street signage, crosswalks, and sidewalks</li> <li>Lack of crossing arms at railroad crossing</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>No commercial passenger airport</li> </ul>

### 8.8.3 Mitigation Strategy

The Barnes County Multi-Jurisdictional Multi-Hazard Plan Update includes a mitigation strategy consisting of seven goals in Chapter 6. The following problem statement and mitigation projects address the mitigation needs of the city of Pillsbury. It should be noted that some mitigation projects that pertain to all jurisdictions are included to encourage county-wide collaboration.

#### **Problem Statement**

Severe winter weather produces heavy snow that blocks roads and results in overland flooding and drainage issues in the spring in the city of Pillsbury. With a high number of abandoned structures and trailer homes, and a high elderly population, the city is vulnerable to natural hazards and man-made threats. The city lacks an emergency siren. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Improved drainage and installation of an emergency siren are a priority for the city.

**City of Pillsbury Project 1: Install dispatch-activated outdoor emergency siren.**

Description/Benefit		The city lacks a dispatch-activated outdoor emergency siren to alert residents of inclement weather and potential threats.					
Hazards Addressed		All					
Affected Jurisdiction(s)		City of Pillsbury					
Project Status		Ongoing and Continue					
Priority		High					
Responsible Agency		City Council, Emergency Services					
Partners		County Commission, Emergency Management, NDAC, NDLC, Regional Council					
Completion Timeframe		2 to 3 years	Cost	Staff time and equipment costs			
Funding Source		Local budgets. N.D. League of Cities. State Homeland Security Grants. NDDDES.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Include in city and/or fire department's capital improvement plan. Apply for grant funding or purchase directly using existing sales tax revenue or budgets. Approval city council or board.		



**City of Pillsbury Project 2: Upgrade existing drainage ditches in the city to reduce/eliminate occurrences of overland flooding.**

Description/Benefit		Reduction of damage to critical facilities and infrastructure from annual flooding to assure access for emergency services and continued operation of public infrastructure. Reduce or eliminate damage to people’s homes.					
Hazards Addressed		Drought, Fire, Flood (overland), Infectious Disease, Severe Summer Weather, Severe Winter Weather					
Affected Jurisdiction(s)		City of Pillsbury					
Project Status		Ongoing and Continue					
Priority		High					
Responsible Agency		City Council, Public Works					
Partners		Emergency Management, Emergency Services					
Completion Timeframe		2 to 3 years	Cost	TBD			
Funding Source		Local budgets. SWC.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	3	5	5	33
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Scope the project, Include in city budget. Apply for grant funding or fund directly using existing sales tax revenue or budgets. Approval city council. Execute.		

#### 8.8.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: administrative and technical, education and outreach, financial, and planning and regulatory. Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. **Tables comparing the mitigation capabilities of the city of Pillsbury with all other jurisdictions in Barnes County can be found below and in Chapter 7, County Mitigation Capability Assessment.**

- Administrative and Technical: Identification of administrative and technical capabilities, which include staff, their skills and tools for mitigation planning to implement specific mitigation actions.
- Education and Outreach: Identification of education and outreach programs, and methods already in place to implement mitigation activities and communicate hazard-related information.
- Financial: Identification of access to or eligibility to use funding resources for hazard mitigation for jurisdictions.
- Planning and Regulatory: Jurisdictional plans, policies, codes, and ordinances adopted and in place that prevent and reduce the impacts of hazards.

#### City of Pillsbury Mitigation Capabilities

Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. Information on the capabilities of the city was gathered at its jurisdictional meeting, committee meetings, and interviews during the planning process.

#### Administrative and Technical

The following narrative details the administrative and technical capabilities of the city of Pillsbury.

The city of Pillsbury has an active city council. The city does not have a chief building official or inspector. The county LEPC serves the city. The city does not have a civil engineer, but contracts when services are needed. The county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning, grant writing and grant administration services. The city conducts graveling of city streets all two-to-three years and mows city and vacant lots. The city is part of the county-wide mutual aid agreement for emergency services. The city, however, is part of the Hope Fire Department, which is headquartered in neighboring Steele County. The city does not have an emergency siren or generators. The fire ISO rating for the city is unknown. The city does not have a fire index sign. It is unknown if emergency services are GIS capable or if hazard data is reported to the emergency manager. It is unknown if the city is Firewise or StormReady Certified.

### **Education and Outreach**

The following narrative details the education and outreach capabilities of the city of Pillsbury.

The city does not have non-profit organizations providing education on hazards but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. The city does not have any entities providing public education on hazards but has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

### **Financial**

The following narrative details the financial capabilities of the city of Pillsbury.

The city does not set aside tax revenue for capital improvements, but does maintain a savings account, which can be used if necessary. The city does not have storm water utility fee as it lacks a storm water system. The city special assesses \$10 per month for maintenance of the sanitary sewer system. The city does not levy special assessments for new development but can do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also can do so if warranted. The city issues building permits through the county. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

### **Planning and Regulatory**

The following narrative details the planning and regulatory capabilities of the city of Pillsbury.

The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning, subdivision ordinances or impact fees. The city issues building permits through the county. The city council serves as the planning commission for the city. The city does not have building codes and does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

#### **8.8.5 Integration of Mitigation Plan into Planning Mechanisms**

Integration of the plan into current planning mechanisms is critical in mitigation to communicate the needs of each jurisdiction to achieve an all-inclusive mitigation strategy. The process for integration of

the mitigation plan is included after each mitigation project, which shows the planning mechanism utilized, the plan element used for integration and the process for integration.

### **8.8.6 Plan Maintenance**

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.

## 8.9 City of Rogers, North Dakota

The following profile includes information specific to the city of Rogers for mitigation planning purposes. The information included is as follows:

- Profile and Inventory;
- Risk Assessment;
- Hazard Scoring Notes;
- Mitigation Projects, and
- Capabilities for Mitigation.

### **Integration into Planning Mechanisms**

The process for integration of the mitigation plan into existing planning mechanisms is discussed at the bottom of each mitigation project in section 8.9.3, in section 8.9.4, and in Chapter 6, Mitigation Strategy.

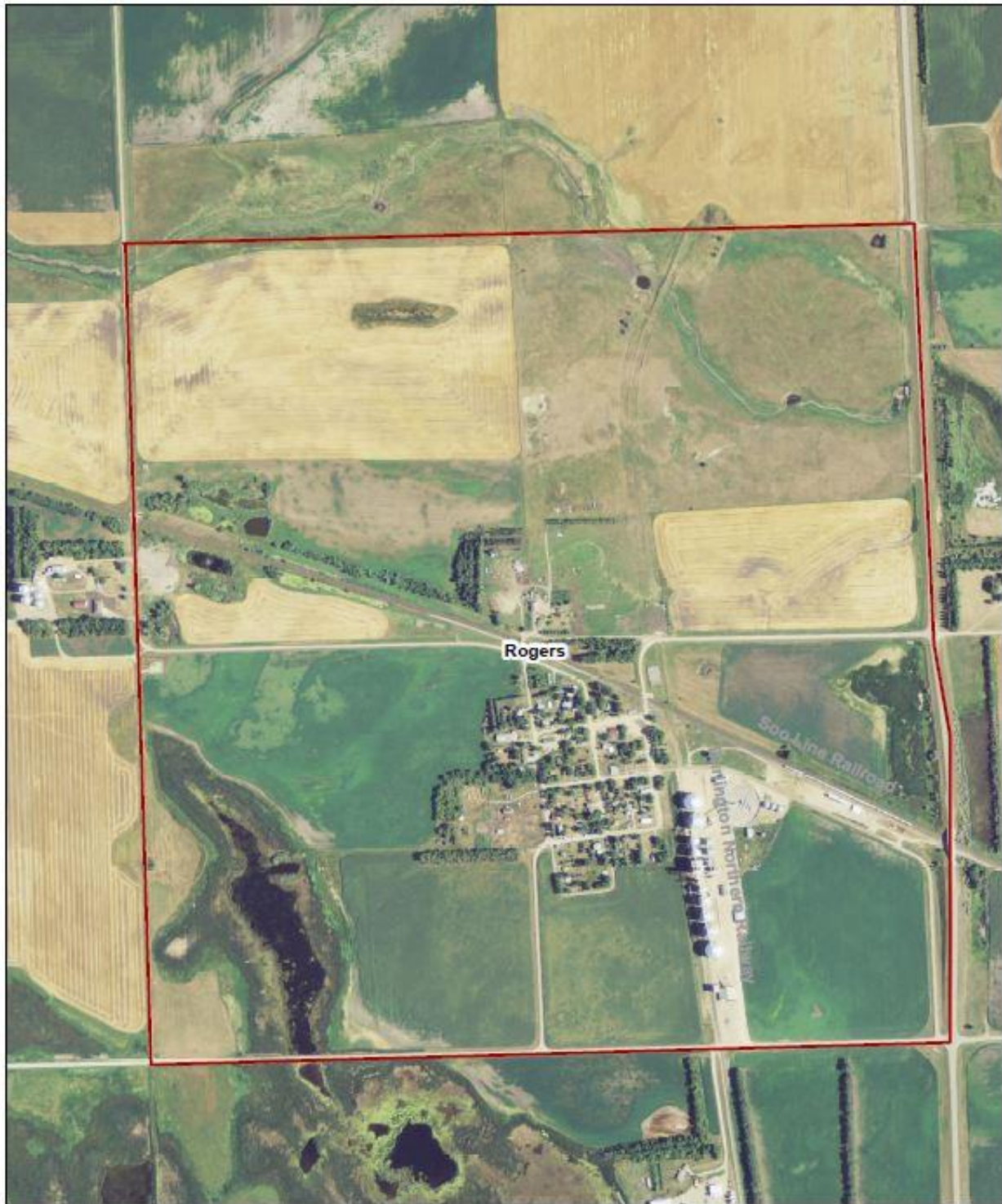
### **Plan Maintenance**

Plan maintenance is shown in section 8.9.6.

### **Critical Facilities and Infrastructure**

Figure 8.9.1 is a map of the city of Rogers provided by Barnes County Emergency Management.

Figure 8.9.1 – City of Rogers, North Dakota



Source(s): Barnes County Emergency Management

**8.9.1 Profile and Inventory**

The location, total population, vulnerable populations, housing units and household size, businesses, critical facilities and infrastructure, new and future development, services, jurisdictional buildings, emergency response services and utilities are shown for the city of Rogers. Detailed narratives follow each section heading to profile the city.

Detailed information on public buildings, services provided, emergency response services and utilities can be found can be found in Chapter 3, Profile and Inventory.

**Location**

The city of Rogers is located on N.D. Highway 1, approximately 10 miles north-northwest of Valley City in Barnes County.

**Population**

Table 8.9.1 shows population trends for the city of Rogers from 1920 to 2010, with an estimate for 2019.

Per the 2010 U.S. Decennial Census, the city of Rogers has a population of 46 people, which is a decrease of 15 people (24.6 percent) from 61 people in 2000.

**Table 8.9.1 – 1920 to 2010 City of Rogers, North Dakota Population Statistics**

1920	1930	1940	1950	1960	1970	1980	1990	2000	2010	2019 (est.)
173	169	174	150	119	96	68	69	61	46	41

Source(s): U.S. Decennial Census; American Community Survey, 5-Year Estimates

**Vulnerable Populations**

Age. Per the 2015 to 2019 American Community Survey 5-Year Estimate, the population of the city of Rogers consists of nine individuals under the age of 20 and no individuals aged 65 and older. According to the city of Rogers, there are approximately 10 people aged 65 and older.

Daycares. There are no daycares in the city of Rogers.

Poverty. Per the 2015 to 2019 American Community Survey 5-Year Estimate, no households in the city of Rogers that live below the poverty line.

Public Schools. There is not a public school in the city of Rogers.

Senior Housing Developments/Care Centers. There are no age-restricted, senior housing developments, or care centers in the city of Rogers.

**Housing Units and Household Size**

The 2015 to 2019 American Community Survey 5-Year Estimate shows there is a total of 24 housing units in the city consisting entirely of single-family homes.

The 2015 to 2019 American Community Survey 5-Year Estimate shows there are 22 households in the city of Rogers resulting in an average household size of 2.18 people.

### **Businesses**

Gavilon elevator and fertilizer plant in the major employer in the city of Rogers. Additional information on businesses and economic development in the city of Rogers or can be obtained by contacting the Valley City-Barnes County Development Group.

### **New and Future Development**

New development is considered any development occurring since the 2015 Barnes County Multi-Hazard Mitigation Plan. Future development is considered any development that is planned, pending, or proposed. The following is a list of new and future development for the city of Rogers.

#### New

- Gavilon bought out ADM, which is the elevator and fertilizer plant in the city of Rogers.

#### Future

- The city is planning to develop a park property on the south end of the city. Plans call for a basketball court and volleyball net.

### **Buildings, Critical Facilities and Infrastructure, and Services and Utilities Provided**

The following section profiles the housing units, services, emergency response services, jurisdictional buildings, and utilities of the city of Rogers. Tables 3.10 to 3.13 in Chapter 3, Profile and Inventory show a complete inventory of this information for Barnes County and incorporated jurisdictions. An “X” indicates if the jurisdiction offers the utility or service (either through contract or employees) or possesses the building or resource. Narratives detailing information for the county and incorporated jurisdictions accompany each table.

Structures. Housing units show where populations are located. Table 3.9 in Chapter 3, Profile and Inventory shows the number of single-family, mobile home structures, and multifamily and in Barnes County and incorporated jurisdictions. The following are key points for the city of Rogers:

- There are 20 single-family housing units comprising 100.0 percent of all housing units in the city of Rogers.
- There are no Mobile/Boat/RV/Van homes or Multifamily housing units in the city of Rogers

Critical Facilities. The following facilities were identified as critical in the city of Rogers.

- Rogers Fire Hall (serves as the city hall and storm shelter)

Infrastructure. The following infrastructure was identified as critical in the city of Rogers.

- The city of Rogers does not a sanitary sewer system. Residents utilize septic systems.
- The city is of Rogers is located on N.D. Highway 1.

Emergency Response Services. The following emergency response services were identified in the city of Rogers.



- Barnes County Ambulance provides ambulance services to the city of Rogers.
- The Rogers Volunteer Fire Department provides fire protection to the city and surrounding area.
- The Barnes County Sheriff's Office provides law enforcement services to the city of Rogers.
- There is one first responder living one-mile south of the city.
- The nearest hospital is CHI-Mercy Hospital in Valley City.
- City-County Health District is in the city of Valley City and provides public health services to the city of Rogers.

Services and Utilities. The following services are provided in the city of Rogers.

- Dakota Sanitation provides garbage collection services to the city of Rogers. A clean-up dumpster is provided once a year by the city council to city residents.
- The city of Rogers does not maintain an inert landfill but disposes of inert debris (branches, trees, leaves, and grass clippings) at the former softball diamond on the north side of the city.
- The city of Rogers does not have a sanitary sewer system. Residents utilize septic systems.
- The city has a storm water system consisting of drainage ditches.
- The Valley-City Times Record is the official newspaper of the city of Rogers.
- Barnes Rural Water District provides drinking/potable water to the city of Rogers.
- Electricity is provided by Otter Tail Power.
- Natural gas is not available in the city of Rogers.
- Fuel oil, propane, and electricity are used as an alternative heating source and is provided by companies chosen by the individual consumer.
- BEK provides phone and internet.

### 8.9.2 Risk Assessment and Hazard Scoring Notes

Table 8.9.2 summarizes the risk assessment scoring of the city of Rogers. The risk assessment and hazard scoring notes for each hazard specific to the city are shown in Table 8.9.3. Risk assessment notes for impact, frequency, likelihood and vulnerability ubiquitous for jurisdictions in Barnes County are found in Chapter 4, Threat and Hazard Identification Assessment in each respective hazard profile.

**Table 8.9.2 – City of Rogers Jurisdiction Risk Assessment Scoring Summary**

<b>Risk Assessment</b>							<b>Jurisdiction: City of Rogers</b>						
<b><u>Natural Hazard</u></b>	<b><u>Impact</u></b>	<b><u>Frequency</u></b>	<b><u>Likelihood</u></b>	<b><u>Vulnerability</u></b>	<b><u>Capabilities</u></b>	<b><u>Total</u></b>							
Drought	4	2	2	3	1	<b>10</b>							
Fire – Urban/Structure Collapse	3	2	2	3	1	<b>9</b>							
Fire – Wildland (Rural)	3	3	4	2	2	<b>10</b>							
Flood	3	3	4	3	1	<b>12</b>							
Geologic Hazard	NA	NA	NA	NA	NA	<b>NA</b>							
Infectious Disease	1	2	3	3	1	<b>8</b>							
Severe Summer Weather	4	3	3	3	2	<b>11</b>							
Severe Winter Weather	3	3	4	4	2	<b>12</b>							
Space Weather	4	1	2	2	1	<b>8</b>							
<b><u>Adversarial Threats</u></b>													
Civil Disturbance	2	2	2	3	1	<b>8</b>							
Criminal, Terrorist or Nation-State Attack	2	2	2	3	1	<b>8</b>							
Cyberattack	4	1	2	2	1	<b>8</b>							
<b><u>Technological Threats</u></b>													
Dam Failure	NA	NA	NA	NA	NA	<b>NA</b>							
Hazardous Material Release	4	2	3	1	1	<b>9</b>							
Transportation Incident	3	2	4	4	1	<b>12</b>							

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 8.9.3 – City of Rogers Jurisdiction Risk Assessment

	<b>Civil Disturbance</b>	
<b>Impact</b>	<ul style="list-style-type: none"> <li>Blocked Roads</li> <li>Business Interruptions</li> <li>Delayed Emergency Response</li> <li>Financial Hardship/Strain (public)</li> </ul>	<ul style="list-style-type: none"> <li>HAZMAT Release – oil trains and natural gas pipeline</li> <li>Human Injury/Death</li> <li>Property Damage (Structure)</li> <li>Property Damage (Vehicle)</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>Never an occurrence of a major incident</li> </ul>	<ul style="list-style-type: none"> <li>DAPL protesters were not active in the city</li> </ul>
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> <li>Presence of railroad infrastructure</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No pipelines</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> <li>Presence of railroad infrastructure</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No pipelines</li> </ul>

Table 8.9.3 – City of Rogers Jurisdiction Risk Assessment – Continued

Criminal, Terrorist, Nation-State Attack			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> <li>• Human Injury/Death</li> <li>• Property Damage (Structure)</li> <li>• Property Damage (Vehicle)</li> </ul> <ul style="list-style-type: none"> <li>• <b>Threats to city water supply</b></li> <li>• Mass Casualties/Fatalities</li> <li>• Loss of Communication Systems</li> <li>• Disease Outbreak/Mass Infections</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No occurrences</li> <li>• Miscellaneous property damage occurring in the city on an occasional basis</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>
<u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>
<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>		

Table 8.9.3 – City of Rogers Jurisdiction Risk Assessment – Continued

Cyberattack			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> <li>• Human Injury/Death</li> <li>• School Closure</li> <li>• <b>Loss of Communication Systems</b></li> <li>• Identity Theft – loss of wages and/or assets</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never an occurrence of a major attack</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Presence of railroad infrastructure</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No pipelines</li> </ul>
<u>More Likely</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No pipelines</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Elderly population relying largely on landlines for communication purposes, remote medical care and equipment monitoring</li> <li>• Presence of railroad infrastructure</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Elderly population relying largely on landlines for communication purposes, remote medical care and equipment monitoring</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No pipelines</li> </ul>
<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Elderly population relying largely on landlines for communication purposes, remote medical care and equipment monitoring</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No pipelines</li> </ul>		

Table 8.9.3 – City of Rogers Jurisdiction Risk Assessment - Continued

		Drought	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Loss of Economy</li> <li>• Loss of Livestock</li> <li>• Loss of Wildlife Habitat (decreased wildlife populations)</li> <li>• Increase in Wildland Fire Potential</li> </ul>	<ul style="list-style-type: none"> <li>• Water quality compromised from stock dams</li> <li>• Diminished soil quality – salinity will increase</li> <li>• Negative impact on mental health of producers and fire responders – “community impact”</li> <li>• Local producers forced to sell off herds which can last for several years</li> <li>• Population loss as people moved away due to loss of economy</li> </ul>	
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Severe Drought of 1961/1962, 1988/1989 to 1991/1992</li> <li>• Summer of 2017, local producers forced to sell off portions of their herds</li> </ul>	<ul style="list-style-type: none"> <li>• End of July through winter of 2016 – county reached severe drought status</li> <li>• Severe drought in summer/fall of 2020</li> </ul>	
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Dry/wet cycle every five to eight years</li> <li>• Climatic patterns will result in an eventual drought of significance</li> <li>• Lack of precipitation</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Heavy precipitation</li> </ul>	
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Wildlife &amp; hunting economy</li> <li>• Agriculture economy</li> <li>• Elderly population</li> <li>• Flat terrain/open topography contributes to conditions</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• City does not have a water tower</li> <li>• City does not have a fire index sign</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Financial assistance programs made available by the state and federal government</li> <li>• Burn Ban by county emergency management</li> <li>• Fire Index monitoring and mapping from NDDDES</li> <li>• Advanced communications such as internet and TV</li> <li>• Back up water supply at the elevator if needed, 400,000 gallons total at times</li> <li>• City received drinking/potable water from Barnes Rural Water District</li> </ul>	

Table 8.9.3 – City of Rogers Jurisdiction Risk Assessment - Continued

Fire – Urban Fire/Structure Collapse			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• HAZMAT Release</li> </ul> <ul style="list-style-type: none"> <li>• Human Injury/Death</li> <li>• Increase Fire Potential</li> <li>• Property damage on a significant scale if impacting downtown structures</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Occurrences of structures/vehicles being impacted every five years</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Age of structures on main street/N.D. Highway 3</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• Railroad infrastructure traversing city limits</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Age of structures on main street/N.D. Highway 3</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• Railroad infrastructure traversing city limits</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> </ul>
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Table 8.9.3 – City of Rogers Jurisdiction Risk Assessment – Continued

Fire – Rural & Wildland			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Crop Loss</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• Increase Fire Potential</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Mass Casualties</li> <li>• Losses could be on a significant scale if impacting a major producer or farmstead</li> <li>• Loss of farm equipment and assets</li> <li>• Loss of Livestock</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Significant fire once every five years</li> <li>• Approximately four wildland fires occurring annually</li> <li>• Controlled burns becoming out of control approximately 40 percent of the time</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> <li>• Railroad infrastructure traversing through city limits</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> <li>• Railroad infrastructure traversing through city limits</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> </ul>
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Table 8.9.3 – City of Rogers Jurisdiction Risk Assessment – Continued

Flood			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Delayed Emergency Response</li> <li>• Flooding (Highway &amp; Structure)</li> <li>• Human Injury/Death</li> <li>• Property Damage / Sewer Backup</li> <li>• Runoff from buildings causes overland flooding</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• When raining heavy, roads become blocked and is expected</li> <li>• Each year it occurs sometimes multiple</li> <li>• Sump pumps are constantly running on a wet year</li> <li>• 3 to 4 times each year water is blocking roads</li> <li>• Can come down in 4 to 5 inches at once</li> <li>• Flash flooding occurs from heavy precipitation</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> <li>• City lacks proper storm water drainage system</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Dry seasons and low precipitation</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> <li>• City lacks proper storm water drainage system</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Dry seasons and low precipitation</li> </ul>
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Table 8.9.3 – City of Rogers Jurisdiction Risk Assessment – Continued

Geologic Hazard			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Delayed Emergency Response</li> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> <li>• Loss of Power</li> <li>• Property Damage</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No incidents involving geologic hazards in or near city limits</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul>
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Table 8.9.3 – City of Rogers Jurisdiction Risk Assessment – Continued

Hazardous Material Release			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Delayed Emergency Response / Increased Fire Potential</li> <li>• Environmental Degradation</li> <li>• Evacuation (localized)</li> <li>• Explosion</li> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> <li>• Loss of Potable Water</li> <li>• Loss of Power</li> <li>• Property Damage</li> <li>• Increased risk of HAZMAT release and/or transportation incidents due to increased oil train traffic and trucks</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Small incidents of leaking anhydrous tanks bi-annually</li> <li>• Never any major spills reported</li> <li>• Never a pipeline leak</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines near the city</li> <li>• Railroad infrastructure traversing through city limits</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> <li>• Decrease in oil trains (from a frequency of one per hour) one the DAPL opened in 2017</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines near the city</li> <li>• Railroad infrastructure traversing through city limits</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> <li>• Decrease in oil trains (from a frequency of one per hour) one the DAPL opened in 2017</li> </ul>
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<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy and related industries</li> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines near the city</li> <li>• No hospital or medical clinic in city limits</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of building codes and enforcement</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Designated truck route in the city of Rogers</li> <li>• Fire departments have some HAZMAT training</li> <li>• Radio-activated emergency siren</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy and related industries</li> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines near the city</li> <li>• No hospital or medical clinic in city limits</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of building codes and enforcement</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Designated truck route in the city of Rogers</li> <li>• Fire departments have some HAZMAT training</li> <li>• Radio-activated emergency siren</li> </ul>
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Table 8.9.3 – City of Rogers Jurisdiction Risk Assessment – Continued

Infectious Disease	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Human Injury/Death</li> <li>• Livestock Loss</li> <li>• Loss of Economy</li> <li>• Mass Casualties</li> </ul> <ul style="list-style-type: none"> <li>• Strain on local medical resources (ambulance)</li> <li>• Loss of medical staff due to sickness</li> <li>• Loss of Potable Water</li> <li>• Financial cost to public health resources</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Annual occurrences of death, primarily among the elderly</li> <li>• Occurrence of disease - 1 in 3 for people annually</li> <li>• Annual occurrences of influenza cases in the local population</li> </ul> <ul style="list-style-type: none"> <li>• The COVID-19 Pandemic of 2020 resulted in mass quarantine and sheltering of the local population and temporary closure of businesses</li> </ul>
<b>Likelihood</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• Dependent on weather for animals and crops</li> <li>• Transporting of animals across state lines</li> <li>• City is in a low-lying area and standing water is a problem</li> </ul> </div> <div style="width: 45%;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> </ul> </div> </div>
<b>Vulnerability</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• Transporting of animals across state lines</li> <li>• No hospital or medical clinic</li> <li>• No vet clinic in city limits</li> <li>• City is in a low-lying area and standing water is a problem</li> </ul> </div> <div style="width: 45%;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> <li>• Immunizations &amp; medications of local population</li> <li>• No care center in the city</li> <li>• No public school</li> <li>• Mowing of city lots and spray for mosquitos</li> </ul> </div> </div>

Table 8.9.3 – City of Rogers Jurisdiction Risk Assessment – Continued

Severe Summer Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• <b>Blocked Roads:</b> Corner of 1<sup>st</sup> by the old gas pump.</li> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – heat exhaustion</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> </ul> <ul style="list-style-type: none"> <li>• Vehicle Damage</li> <li>• Loss of Livestock</li> <li>• Loss of Crops</li> <li>• Loss of Power/Downed Power Lines -</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Heavy rain from time to time each summer</li> <li>• Not much hail recently</li> <li>• Couple high winds and strong storms per summer season</li> <li>• Straight line winds about 6 to 7 years ago-lots of trees blew down</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at fire hall, and lift station</li> <li>• Lack of building codes and enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Culverts get stuck with tree branches limiting drainage</li> <li>• Lack of storm water drainage system</li> <li>• City park-overland flooding from heavy rain</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Dispatch-activated emergency siren</li> <li>• No public school</li> </ul> </td> </tr> </table>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at fire hall, and lift station</li> <li>• Lack of building codes and enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Culverts get stuck with tree branches limiting drainage</li> <li>• Lack of storm water drainage system</li> <li>• City park-overland flooding from heavy rain</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Dispatch-activated emergency siren</li> <li>• No public school</li> </ul>
<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at fire hall, and lift station</li> <li>• Lack of building codes and enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Culverts get stuck with tree branches limiting drainage</li> <li>• Lack of storm water drainage system</li> <li>• City park-overland flooding from heavy rain</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Dispatch-activated emergency siren</li> <li>• No public school</li> </ul>		

Table 8.9.3 – City of Rogers Jurisdiction Risk Assessment – Continued

Severe Winter Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – wind chill</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> <li>• Loss of Crops</li> <li>• Loss of Livestock</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> <li>• Vehicle Damage</li> <li>• Infrastructure Degradation</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Happens yearly, weather and climate in the area</li> <li>• High winds and ground blizzard conditions-always blocks roads to N.D. Highway 1</li> <li>• March of 1997-whole county was out for 3 days up to a week-out for 2 weeks in Rogers</li> <li>• Four to five strong storms per season</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> <li>• Removal of shelter belts and vegetation leads to more ground blizzard conditions-happening outside of town but nowhere near city limits</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at fire hall and lift station</li> <li>• Lack of building codes and enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of storm water drainage system</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Dispatch-activated emergency siren</li> <li>• No public school</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at fire hall and lift station</li> <li>• Lack of building codes and enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of storm water drainage system</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Dispatch-activated emergency siren</li> <li>• No public school</li> </ul>
<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at fire hall and lift station</li> <li>• Lack of building codes and enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of storm water drainage system</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Dispatch-activated emergency siren</li> <li>• No public school</li> </ul>		

Table 8.9.3 – City of Rogers Jurisdiction Risk Assessment – Continued

Space Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Loss of operation of the city hall, fire hall, lift station, etc.</li> <li>• Loss/outage of medical devices at private residences</li> <li>• Property damage from sewer backups due to loss of lift station</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never a recorded occurrence in Barnes County or North Dakota</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Dependent on solar activity and the 11-year solar cycle</li> <li>• Likely to occur once every 500 years per the 2018 N.D. Enhanced Mitigation MAOP</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> <li>• Lack of permanent generator at fire hall and lift Station</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> <li>• City Auditor’s Office conducts business on paper and maintains hard copy records</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> <li>• Lack of permanent generator at fire hall and lift Station</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> <li>• City Auditor’s Office conducts business on paper and maintains hard copy records</li> </ul>
<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> <li>• Lack of permanent generator at fire hall and lift Station</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> <li>• City Auditor’s Office conducts business on paper and maintains hard copy records</li> </ul>		

Table 8.9.3 – City of Rogers Jurisdiction Risk Assessment – Continued

	Transportation Incident	
Impact	<ul style="list-style-type: none"> <li>Blocked roads from inadequate road clearing</li> <li>Human Injury/Death</li> <li>Increased Fire Potential</li> <li>Loss of Transportation/Accessibility</li> <li>Mass Casualties/Fatalities</li> </ul>	<ul style="list-style-type: none"> <li>Delayed Emergency Response</li> <li>HAZMAT Release</li> <li>Livestock Loss</li> <li>Business Interruptions</li> <li>Property Damage</li> <li>Could be catastrophic if involving a school bus filled with children and a truck carrying hazardous materials</li> </ul>
Frequency	<ul style="list-style-type: none"> <li>Annual occurrences of accidents involving cars and/or farm equipment</li> </ul>	Nothing major in the area in recent years
Likelihood	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Intoxicated drivers</li> <li>High truck traffic from agriculture-related traffic</li> <li>Railroad infrastructure traversing through city limits</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>No commercial passenger airport</li> <li>Decrease in oil trains (from a frequency of one per hour) one the DAPL opened in 2017</li> </ul>
Vulnerability	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Intoxicated drivers</li> <li>High truck traffic from agriculture-related traffic</li> <li>No hospital or medical clinic</li> <li>Railroad infrastructure traversing through city limits</li> <li>Lack of paved streets</li> <li>Lack of street signage, crosswalks, and sidewalks</li> <li>Lack of crossing arms at railroad crossing</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>No commercial passenger airport</li> <li>Presence of designated truck routes through city limits</li> </ul>



### 8.9.3 Mitigation Strategy

The Barnes County Multi-Jurisdictional Multi-Hazard Plan Update includes a mitigation strategy consisting of seven goals in Chapter 6. The following problem statement and mitigation projects address the mitigation needs of the city of Rogers. It should be noted that some mitigation projects that pertain to all jurisdictions are included to encourage county-wide collaboration.

#### **Problem Statement**

The city of Rogers experiences overland flooding from severe summer and winter weather as it lacks a property storm water system and has a high-water table. Blocked roads from standing water are common. The city lacks generators at critical facilities and infrastructure. The city has two outdoor early warning sirens – one manual-activated and once dispatch-activated. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Improved drainage, installation of generators at critical facilities and infrastructure, and upgrading of outdoor early warning system are a priority for the city.

**City of Rogers Project 1: Establish permanent drainage for the city park and other low-lying areas to reduce/eliminate occurrences of overland flooding.**

Description/Benefit	Reduction of damage to critical facilities and infrastructure from annual flooding to assure access for emergency services and continued operation of public infrastructure. The county hired a company from Minnesota to apply Chloride to help with drainage and cut down on dust particles on the access road to the city from N.D. Highway 1. Culverts get stuck with tree branches and other debris.		
Hazards Addressed	Flood, Infectious Disease, Severe Summer Weather, Severe Winter Weather		
Affected Jurisdiction(s)	City of Rogers		
Project Status	Ongoing and Continue		
Priority	High		
Responsible Agency	City Council, Public Works		
Partners	Water Resource District, SWC		
Completion Timeframe	2 to 3 years	Cost	Project-specific \$3,000 for Chloride, \$500 for county to prepare the road
Funding Source	Local budgets. SWC. Gavilon.		

**Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)**

Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	5	5	1	29

**Integration of Mitigation Plan Requirements into Local Planning Mechanisms**

<u>Planning Mechanisms Utilized</u>	<u>Plan Element</u>	<u>Process for Integration</u>
Barnes County LEOP & Mitigation Plan Barnes County THIRA	Capability Assessment, Hazard History, Risk Assessment	Work with water board and/or engineering firms to establish appropriate actions. Implement.

**City of Rogers Project 2: Install permanent generators at critical facilities and infrastructure.**

Description/Benefit		Test existing generators and create regularly scheduled maintenance system. Install new generators to establish permanent source of backup power to maintain continued operation of the following critical facilities and infrastructure.  <u>Install New</u> <ul style="list-style-type: none"> <li>• Rogers Fire Hall</li> <li>• Lift station (look at portable options)</li> </ul>					
Hazards Addressed		All hazards					
Affected Jurisdiction(s)		City of Rogers					
Project Status		Ongoing and Continue					
Priority		High					
Responsible Agency		City Council, Emergency Services, Public Works					
Partners		Emergency Management, Public Utilities					
Completion Timeframe		2 to 3 years	Cost	Project-specific			
Funding Source		Public Utilities, Regional Council, RD. FEMA Pre-Disaster Mitigation Grant Program (PDM). State Homeland Security grants.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>			<u>Plan Element Utilized</u>			<u>Process for Integration</u>	
Barnes County LEOP & Mitigation Plan Barnes County THIRA			Capability Assessment, Hazard History, Risk Assessment			Include in city and/or fire department's budget. Apply for grant funding or purchase directly using existing sales tax revenue or budgets. Approval city council or board.	

**City of Rogers Project 3: Upgrade manually-activated outdoor emergency siren.**

Description/Benefit		The city’s outdoor emergency siren is manually activated and needs to be upgraded to provide radio-activation/dispatch-activation. The city has one manual-activated siren and one dispatch-activated siren.					
Hazards Addressed		All					
Affected Jurisdiction(s)		City of Rogers					
Project Status		Ongoing and Continue					
Priority		High					
Responsible Agency		City Council, Emergency Services					
Partners		County Commission, Emergency Management, NDAC, NDLC, Regional Council					
Completion Timeframe		2 to 3 years	Cost	Up to \$25,000 per siren			
Funding Source		Local budgets. N.D. League of Cities. State Homeland Security Grants. NDDDES.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Include in city and/or fire department’s capital improvement plan. Apply for grant funding or purchase directly using existing sales tax revenue or budgets. Approval city council or board.		

#### 8.9.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: administrative and technical, education and outreach, financial, and planning and regulatory. Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. **Tables comparing the mitigation capabilities of the city of Rogers with all other jurisdictions in Barnes County can be found below and in Chapter 7, County Mitigation Capability Assessment.**

- Administrative and Technical: Identification of administrative and technical capabilities, which include staff, their skills and tools for mitigation planning to implement specific mitigation actions.
- Education and Outreach: Identification of education and outreach programs, and methods already in place to implement mitigation activities and communicate hazard-related information.
- Financial: Identification of access to or eligibility to use funding resources for hazard mitigation for jurisdictions.
- Planning and Regulatory: Jurisdictional plans, policies, codes, and ordinances adopted and in place that prevent and reduce the impacts of hazards.

#### City of Rogers Mitigation Capabilities

Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. Information on the capabilities of the city was gathered at its jurisdictional meeting, committee meetings, and interviews during the planning process.

#### Administrative and Technical

The following narrative details the administrative and technical capabilities of the city of Rogers.

The city of Rogers has an active city council. The city does not have a chief building official or inspector. The county LEPC serves the city. The city does not have a civil engineer but can contract with a private firm when services are needed. The county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning, grant writing and grant administration services. However, the city council and auditor have administration capabilities. Infrastructure maintenance is conducted on an as-needed basis. The city is part of the county-wide mutual aid agreement for emergency services. The city also has signed mutual aid agreements specifically with Dazey, Sanborn, Valley City and Wimbledon for fire protection. The city has two emergency sirens with both located at the fire hall and one being manually activated and the other activated by county dispatch. The city does not have any generators. The fire ISO rating for the city is 10. The city does not have a fire index sign. Emergency services are not GIS capable. The fire chief and assistant fire chief report hazard data to the emergency manager. The city is not Firewise or StormReady Certified.

### **Education and Outreach**

The following narrative details the education and outreach capabilities of the city of Rogers.

The city does not have non-profit organizations providing education on hazards but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. Adam Benson-Quinn conducts hazard education, safety drills and precaution workshops for employees, but not the public. The city also has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

### **Financial**

The following narrative details the financial capabilities of the city of Rogers.

The city does not set aside tax revenue for capital improvements and only has a general fund. The city does not have storm water utility fee as it lacks a storm water system. The city does not charge a sanitary sewer fee despite having a sanitary sewer system. The city does not levy special assessments for new development but can do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also can do so if warranted. The city issues building permits. The city has access to CDBG funds through the SCDRC. The Adam Benson-Quinn elevator provides funding to the city when needed, which can potentially be used for mitigation purposes. The surrounding township and county school districts are other sources of funding for mitigation.

### **Planning and Regulatory**

The following narrative details the planning and regulatory capabilities of the city of Rogers.

The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city does not have zoning, subdivision ordinances or impact fees. The city issues building permits for \$5. The city council serves as the planning commission for the city. The city does not have building codes and does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

#### **8.9.5 Integration of Mitigation Plan into Planning Mechanisms**

Integration of the plan into current planning mechanisms is critical in mitigation to communicate the needs of each jurisdiction to achieve an all-inclusive mitigation strategy. The process for integration of

the mitigation plan is included after each mitigation project, which shows the planning mechanism utilized, the plan element used for integration and the process for integration.

### **8.9.6 Plan Maintenance**

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.

## 8.10 City of Sanborn, North Dakota

The following profile includes information specific to the city of Sanborn for mitigation planning purposes. The information included is as follows:

- Profile and Inventory;
- Risk Assessment;
- Hazard Scoring Notes;
- Mitigation Projects, and
- Capabilities for Mitigation.

### **Integration into Planning Mechanisms**

The process for integration of the mitigation plan into existing planning mechanisms is discussed at the bottom of each mitigation project in section 8.10.3, in section 8.10.4, and in Chapter 6, Mitigation Strategy.

### **Plan Maintenance**

Plan maintenance is shown in section 8.10.6.

### **Critical Facilities and Infrastructure**

Figure 8.10.1 is a map of the city of Sanborn provided by Barnes County Emergency Management.



Figure 8.10.1 – City of Sanborn, North Dakota



Source(s): Barnes County Emergency Management

**8.10.1 Profile and Inventory**

The location, total population, vulnerable populations, housing units and household size, businesses, critical facilities and infrastructure, new and future development, services, jurisdictional buildings, emergency response services and utilities are shown for the city of Sanborn. Detailed narratives follow each section heading to profile the city.

Detailed information on public buildings, services provided, emergency response services and utilities can be found can be found in Chapter 3, Profile and Inventory.

**Location**

The city of Sanborn is located near the intersection of N.D. Highway 1 and Interstate 94, approximately 11 miles west of Valley City in Barnes County.

**Population**

Table 8.10.1 shows population trends for the city of Sanborn from 1920 to 2010, with an estimate for 2019.

Per the 2010 U.S. Decennial Census, the city of Sanborn has a population of 172 people, which is a decrease of 19 people (9.9 percent) from 191 people in 2000.

**Table 8.10.1 – 1920 to 2010 City of Sanborn, North Dakota Population Statistics**

1920	1930	1940	1950	1960	1970	1980	1990	2000	2010	2019 (est.)
391	343	366	324	263	255	237	164	194	192	170

Source(s): U.S. Decennial Census; American Community Survey, 5-Year Estimates

**Vulnerable Populations**

Age. Per the 2015 to 2019 American Community Survey 5-Year Estimate, the population of the city of Sanborn consists of 31 individuals under the age of 20 and 35 individuals aged 65 and older.

Daycares. There are no daycares in the city of Sanborn.

Poverty. Per the 2015 to 2019 American Community Survey 5-Year Estimate, there are 11 households in the city of Sanborn that live below the poverty line.

Public Schools. There is not a public school in the city of Sanborn.

Senior Housing Developments/Care Centers. There are no age-restricted, senior housing developments, or care centers in the city of Sanborn.

**Housing Units and Household Size**

The 2015 to 2019 American Community Survey 5-Year Estimate shows there is a total of 83 housing units in the city consisting of 70 single-family homes, seven mobile/RV homes, and seven multifamily homes.

The 2015 to 2019 American Community Survey 5-Year Estimate shows there are 83 households in the city of Sanborn resulting in an average household size of 2.13 people.

### **Businesses**

There are no major employers in the city of Sanborn. Additional information on businesses and economic development in the city of Sanborn or can be obtained by contacting the Valley City-Barnes County Development Group.

### **New and Future Development**

New development is considered any development occurring since the 2015 Barnes County Multi-Hazard Mitigation Plan. Future development is considered any development that is planned, pending, or proposed. No new or future development was identified at the time of this plan update.

### **Buildings, Critical Facilities and Infrastructure, and Services and Utilities Provided**

The following section profiles the housing units, services, emergency response services, jurisdictional buildings, and utilities of the city of Sanborn. Tables 3.10 to 3.13 in Chapter 3, Profile and Inventory show a complete inventory of this information for Barnes County and incorporated jurisdictions. An “X” indicates if the jurisdiction offers the utility or service (either through contract or employees) or possesses the building or resource. Narratives detailing information for the county and incorporated jurisdictions accompany each table.

Structures. Housing units show where populations are located. Table 3.9 in Chapter 3, Profile and Inventory shows the number of single-family, mobile home structures, and multifamily and in Barnes County and incorporated jurisdictions. The following are key points for the city of Sanborn:

- There are 70 single-family housing units comprising 84.3 percent of all housing units in the city of Sanborn.
- There are seven Mobile/Boat/RV/Van homes comprising 8.4 percent of all housing units in the city of Sanborn
- There are six Multifamily housing units comprising 7.3 percent of all hours units in the city of Sanborn.

Critical Facilities. The following facilities were identified as critical in the city of Sanborn.

- Sanborn City Hall/Community Center/City Shop (also serves as a storm shelter).
- Sanborn Fire Hall (also serves as a storm shelter).
- U.S. Post Office.

Infrastructure. The following infrastructure was identified as critical in the city of Sanborn.

- The city of Sanborn has a sanitary sewer system with two lagoon cells and a lift station. There are no septic systems in the city of Sanborn.
- The city is of Sanborn is located at the Intersection of Interstate 94 and N.D. Highway 1.

Emergency Response Services. The following emergency response services were identified in the city of Sanborn.

- Barnes County Ambulance provides ambulance services to the city of Sanborn.
- The Sanborn Volunteer Fire Department provide fire protection to the city and surrounding area.
- The Barnes County Sherriff's Office provides law enforcement services to the city of Sanborn.
- The city has 18 first responders.
- The nearest hospital is CHI-Mercy Hospital in Valley City.
- City-County Health District is in the city of Valley City and provides public health services to the city of Sanborn.

Services and Utilities. The following services are provided in the city of Sanborn.

- Sanitation Specialists provides garbage collection services to the city of Sanborn.
- The city of Sanborn maintains an inert landfill.
- The city of Sanborn has a sanitary sewer system with two lagoon cells and a lift station. There are no septic systems in the city of Sanborn.
- The city has a storm water system consisting of drainage ditches.
- The Valley City Times-Record is the official newspaper of the city of Sanborn.
- Barnes Rural Water District provides drinking/potable water to the city of Sanborn.
- Electricity is provided by Otter Tail Power.
- Natural gas is provided by MDU.
- Fuel oil, propane, and electricity are used as an alternative heating source and is provided by companies chosen by the individual consumer.
- BEK provides phone and internet.

### 8.10.2 Risk Assessment and Hazard Scoring Notes

Table 8.10.2 summarizes the risk assessment scoring of the city of Sanborn. The risk assessment and hazard scoring notes for each hazard specific to the city are shown in Table 8.10.3. Risk assessment notes for impact, frequency, likelihood and vulnerability ubiquitous for jurisdictions in Barnes County are found in Chapter 4, Threat and Hazard Identification Assessment in each respective hazard profile.

**Table 8.10.2 – City of Sanborn Jurisdiction Risk Assessment Scoring Summary**

<b>Risk Assessment</b>							<b>Jurisdiction: City of Sanborn</b>					
<b><u>Natural Hazard</u></b>	<b><u>Impact</u></b>	<b><u>Frequency</u></b>	<b><u>Likelihood</u></b>	<b><u>Vulnerability</u></b>	<b><u>Capabilities</u></b>	<b><u>Total</u></b>						
Drought	4	1	2	2	1	<b>8</b>						
Fire – Urban/Structure Collapse	2	2	3	4	3	<b>8</b>						
Fire – Wildland (Rural)	3	2	3	3	3	<b>8</b>						
Flood	4	3	3	2	1	<b>11</b>						
Geologic Hazard	NA	NA	NA	NA	NA	<b>NA</b>						
Infectious Disease	4	2	3	3	1	<b>11</b>						
Severe Summer Weather	4	2	4	3	1	<b>12</b>						
Severe Winter Weather	4	3	4	3	1	<b>13</b>						
Space Weather	4	1	2	2	1	<b>8</b>						
<b><u>Adversarial Threats</u></b>												
Civil Disturbance	4	1	2	4	1	<b>10</b>						
Criminal, Terrorist or Nation-State Attack	4	1	2	4	1	<b>10</b>						
Cyberattack	4	1	2	3	1	<b>9</b>						
<b><u>Technological Threats</u></b>												
Dam Failure	NA	NA	NA	NA	NA	<b>NA</b>						
Hazardous Material Release	4	2	4	4	1	<b>13</b>						
Transportation Incident	4	2	4	4	1	<b>13</b>						

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 8.10.3 – City of Sanborn Jurisdiction Risk Assessment

	<b>Civil Disturbance</b>	
<b>Impact</b>	<ul style="list-style-type: none"> <li>Blocked Roads</li> <li>Business Interruptions</li> <li>Delayed Emergency Response</li> <li>Financial Hardship/Strain (public)</li> </ul>	<ul style="list-style-type: none"> <li>HAZMAT Release – oil trains and natural gas pipeline</li> <li>Human Injury/Death</li> <li>Property Damage (Structure)</li> <li>Property Damage (Vehicle)</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>Never an occurrence of a major incident</li> </ul>	<ul style="list-style-type: none"> <li>DAPL protesters were not active in the city</li> </ul>
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> <li>Presence of railroad infrastructure</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No pipelines</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> <li>Presence of railroad infrastructure</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No pipelines</li> </ul>

Table 8.10.3 – City of Sanborn Jurisdiction Risk Assessment – Continued

Criminal, Terrorist, Nation-State Attack			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> <li>• Human Injury/Death</li> <li>• Property Damage (Structure)</li> <li>• Property Damage (Vehicle)</li> </ul> <ul style="list-style-type: none"> <li>• <b>Threats to city water supply</b></li> <li>• Mass Casualties/Fatalities</li> <li>• Loss of Communication Systems</li> <li>• Disease Outbreak/Mass Infections</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No occurrences</li> <li>• Miscellaneous property damage occurring in the city on an occasional basis</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>
<u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>
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Table 8.10.3 – City of Sanborn Jurisdiction Risk Assessment – Continued

Cyberattack			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> <li>• Human Injury/Death</li> <li>• School Closure</li> <li>• <b>Loss of Communication Systems</b></li> <li>• Identity Theft – loss of wages and/or assets</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never an occurrence of a major attack</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Presence of railroad infrastructure</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No pipelines</li> </ul>
<u>More Likely</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No pipelines</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Elderly population relying largely on landlines for communication purposes, remote medical care and equipment monitoring</li> <li>• Presence of railroad infrastructure</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Elderly population relying largely on landlines for communication purposes, remote medical care and equipment monitoring</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No pipelines</li> </ul>
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Table 8.10.3 – City of Sanborn Jurisdiction Risk Assessment - Continued

		Drought	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Loss of Economy</li> <li>• Loss of Livestock</li> <li>• Loss of Wildlife Habitat (decreased wildlife populations)</li> <li>• Increase in Wildland Fire Potential</li> </ul>	<ul style="list-style-type: none"> <li>• Water quality compromised from stock dams</li> <li>• Diminished soil quality – salinity will increase</li> <li>• Negative impact on mental health of producers and fire responders – “community impact”</li> <li>• Local producers forced to sell off herds which can last for several years</li> <li>• Population loss as people moved away due to loss of economy</li> </ul>	
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Severe Drought of 1961/1962, 1988/1989 to 1991/1992</li> <li>• Summer of 2017, local producers forced to sell off portions of their herds</li> </ul>	<ul style="list-style-type: none"> <li>• End of July through winter of 2016 – county reached severe drought status</li> <li>• Severe drought in summer/fall of 2020</li> </ul>	
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Dry/wet cycle every five to eight years</li> <li>• Climatic patterns will result in an eventual drought of significance</li> <li>• Lack of precipitation</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Heavy precipitation</li> </ul>	
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Wildlife &amp; hunting economy</li> <li>• Agriculture economy</li> <li>• Elderly population</li> <li>• Flat terrain/open topography contributes to conditions</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• City does not have a fire index sign</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Financial assistance programs made available by the state and federal government</li> <li>• Burn Ban by county emergency management</li> <li>• Fire Index monitoring and mapping from NDDDES</li> <li>• Advanced communications such as internet and TV</li> <li>• City receives drinking/potable water from Barnes Rural Water District</li> <li>• City has a water tower</li> </ul>	

Table 8.10.3 – City of Sanborn Jurisdiction Risk Assessment - Continued

Fire – Urban Fire/Structure Collapse	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• HAZMAT Release</li> </ul> <ul style="list-style-type: none"> <li>• Human Injury/Death</li> <li>• Increase Fire Potential</li> <li>• Property damage on a significant scale if impacting downtown structures</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Occurrences of structures/vehicles being impacted every five years</li> </ul> <ul style="list-style-type: none"> <li>• Smaller fires in recent years resulting in loss of garages and sheds</li> <li>• Bar and motel burned down in 2002</li> <li>• Bar/business in town collapsed due to explosion of substance in neighboring building in late 1990s</li> </ul>
<b>Likelihood</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Age of structures on main street</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• Railroad infrastructure traversing city limits</li> <li>• Adopted state building codes but lacks enforcement</li> </ul> </div> <div style="width: 48%;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> </ul> </div> </div>
<b>Vulnerability</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Age of structures</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• Fire Hall does not have a permanent or portable generator</li> <li>• Prolonged response times due to limited fire staff during the daytime</li> <li>• Railroad infrastructure traversing city limits</li> <li>• Adopted state building codes but lacks enforcement</li> </ul> </div> <div style="width: 48%;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> <li>• City has ability to pump water from city hydrants</li> </ul> </div> </div>

Table 8.10.3 – City of Sanborn Jurisdiction Risk Assessment – Continued

Fire – Rural & Wildland			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Crop Loss</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• Increase Fire Potential</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Significant fire once every five years</li> <li>• Approximately four wildland fires occurring annually</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> <li>• Railroad infrastructure traversing through city limits</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> </ul> </td> </tr> </table>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> <li>• Railroad infrastructure traversing through city limits</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> </ul>
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<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> <li>• Large fire district – strained coverage/resources</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of fire breaks around city limits</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Removal of CRP</li> <li>• Summer and winter weather with heavy precipitation</li> <li>• MOUs with neighboring fire departments</li> <li>• Burn bans by county emergency management for areas outside city limits</li> <li>• Fire department possess equipment, fire trucks, 10,000-gallon fire semi-tanker and highly educated/well trained volunteer staff</li> </ul> </td> </tr> </table>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> <li>• Large fire district – strained coverage/resources</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of fire breaks around city limits</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Removal of CRP</li> <li>• Summer and winter weather with heavy precipitation</li> <li>• MOUs with neighboring fire departments</li> <li>• Burn bans by county emergency management for areas outside city limits</li> <li>• Fire department possess equipment, fire trucks, 10,000-gallon fire semi-tanker and highly educated/well trained volunteer staff</li> </ul>
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Table 8.10.3 – City of Sanborn Jurisdiction Risk Assessment – Continued

		Flood			
Impact	<p><b>Blocked Roads:</b> Poor drainage blocks access to the fire hall on 6<sup>th</sup> Ave, east side of town by 5<sup>th</sup> Ave, intersection of 5<sup>th</sup> Ave and 6<sup>th</sup> St., intersection of 7<sup>th</sup> St. and 6<sup>th</sup> Ave, intersection of 3<sup>rd</sup> Ave and 4<sup>th</sup> St., multiple culverts throughout city limits.</p> <ul style="list-style-type: none"> <li>• Delayed Emergency Response</li> <li>• Flooding (Highway &amp; Structure)</li> <li>• Human Injury/Death</li> <li>• Property Damage / Sewer Backup</li> <li>• <b>Runoff from buildings causes overland flooding</b></li> </ul>				
Frequency	<ul style="list-style-type: none"> <li>• Depends largely on weather patterns</li> <li>• Large snow melt in spring of 2009, 2010, 2011 and 2019/2020 resulted in overland flooding of city streets</li> <li>• Flash flooding occurs from heavy precipitation</li> </ul>				
Likelihood	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> <li>• Lack of storm water system in the city for drainage</li> <li>• Topography does not allow swift drainage of precipitation, snow melt, standing water, etc.</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Dry seasons and low precipitation</li> </ul> </td> </tr> </table>			<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> <li>• Lack of storm water system in the city for drainage</li> <li>• Topography does not allow swift drainage of precipitation, snow melt, standing water, etc.</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Dry seasons and low precipitation</li> </ul>
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Vulnerability	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> <li>• Local topography of the city with closed basins</li> <li>• City is not enrolled in the NFIP</li> <li>• City does not have flood ordinances</li> <li>• Lack of storm water system in the city for drainage</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Alternate routes were identified for townships roads</li> </ul> </td> </tr> </table>			<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> <li>• Local topography of the city with closed basins</li> <li>• City is not enrolled in the NFIP</li> <li>• City does not have flood ordinances</li> <li>• Lack of storm water system in the city for drainage</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Alternate routes were identified for townships roads</li> </ul>
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Table 8.10.3 – City of Sanborn Jurisdiction Risk Assessment – Continued

	Geologic Hazard	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Delayed Emergency Response</li> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of Power</li> <li>• Property Damage</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No incidents involving geologic hazards in or near city limits</li> </ul>	
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul>

Table 8.10.3 – City of Sanborn Jurisdiction Risk Assessment – Continued

Hazardous Material Release			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Delayed Emergency Response / Increased Fire Potential</li> <li>• Environmental Degradation</li> <li>• Evacuation (localized)</li> <li>• Explosion</li> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> <li>• Loss of Potable Water</li> <li>• Loss of Power</li> <li>• Property Damage</li> <li>• Increased risk of HAZMAT release and/or transportation incidents due to increased oil train traffic and trucks</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Small incidents of leaking anhydrous tanks bi-annually</li> <li>• Never any major spills reported</li> <li>• Never a pipeline leak</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• City located on Interstate 94</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> <li>• Zoning and building codes</li> <li>• Decrease in oil trains (from a frequency of one per hour) one the DAPL opened in 2017</li> </ul> </td> </tr> </table>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• City located on Interstate 94</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> <li>• Zoning and building codes</li> <li>• Decrease in oil trains (from a frequency of one per hour) one the DAPL opened in 2017</li> </ul>
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Table 8.10.3 – City of Sanborn Jurisdiction Risk Assessment – Continued

	Infectious Disease	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Human Injury/Death</li> <li>• Livestock Loss</li> <li>• Loss of Economy</li> <li>• Mass Casualties</li> </ul>	<ul style="list-style-type: none"> <li>• Strain on local medical resources (ambulance)</li> <li>• Loss of medical staff due to sickness</li> <li>• Loss of Potable Water</li> <li>• Financial cost to public health resources</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Annual occurrences of death, primarily among the elderly</li> <li>• Occurrence of disease - 1 in 3 for people annually</li> <li>• Annual occurrences of influenza cases in the local population</li> </ul>	<ul style="list-style-type: none"> <li>• The COVID-19 Pandemic of 2020 resulted in mass quarantine and sheltering of the local population and temporary closure of businesses</li> </ul>
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• Dependent on weather for animals and crops</li> <li>• Transporting of animals across state lines</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• Transporting of animals across state lines</li> <li>• No hospital or medical clinic</li> <li>• No vet clinic in city limits</li> <li>• Standing water on the west side of town on private residence provides habitat for mosquitos</li> <li>• Lack of proper storm water drainage system results in standing water</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> <li>• Immunizations &amp; medications of local population</li> <li>• No care center in the city</li> <li>• No public school</li> <li>• Residents mow most lawns and keep vegetation under control</li> </ul>

Table 8.10.3 – City of Sanborn Jurisdiction Risk Assessment – Continued

Severe Summer Weather			
<b>Impact</b>	<p><b>Blocked Roads:</b> Poor drainage blocks access to the fire hall on 6<sup>th</sup> Ave, east side of town by 5<sup>th</sup> Ave, intersection of 5<sup>th</sup> Ave and 6<sup>th</sup> St., intersection of 7<sup>th</sup> St. and 6<sup>th</sup> Ave, intersection of 3<sup>rd</sup> Ave and 4<sup>th</sup> St., multiple culverts throughout city limits.</p> <ul style="list-style-type: none"> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – heat exhaustion</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> </ul> <ul style="list-style-type: none"> <li>• Vehicle Damage</li> <li>• Loss of Livestock</li> <li>• Loss of Crops</li> <li>• Loss of Power/Downed Power Lines -</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Heavy rain from time to time during summer months</li> <li>• Around two-to-three high winds and strong storms per summer season</li> <li>• Each year structures experience damage to shingles</li> <li>• Each year tree branches fall and damage structures</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at fire hall, and lift station</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• City located on Interstate 94</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes but lacks enforcement</li> <li>• Dispatch-activated emergency siren</li> <li>• No public school</li> <li>• City has inert landfill</li> <li>• Presence of three storm shelters</li> </ul> </td> </tr> </table>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at fire hall, and lift station</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• City located on Interstate 94</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes but lacks enforcement</li> <li>• Dispatch-activated emergency siren</li> <li>• No public school</li> <li>• City has inert landfill</li> <li>• Presence of three storm shelters</li> </ul>
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Table 8.10.3 – City of Sanborn Jurisdiction Risk Assessment – Continued

		Severe Winter Weather	
<b>Impact</b>	<p><b>Blocked Roads:</b> Poor drainage blocks access to the fire hall on 6<sup>th</sup> Ave, east side of town by 5<sup>th</sup> Ave, intersection of 5<sup>th</sup> Ave and 6<sup>th</sup> St., intersection of 7<sup>th</sup> St. and 6<sup>th</sup> Ave, intersection of 3<sup>rd</sup> Ave and 4<sup>th</sup> St., multiple culverts throughout city limits.</p> <ul style="list-style-type: none"> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – wind chill</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of Crops</li> <li>• Loss of Livestock</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> <li>• Vehicle Damage</li> <li>• Infrastructure Degradation</li> </ul>	
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Happens yearly due to weather and climate in the area</li> <li>• High winds and ground blizzard conditions occurs each year</li> <li>• Two or three significant blizzards producing damage to trees and property annually</li> </ul>	<ul style="list-style-type: none"> <li>• Ice storm in 1997 resulted in isolation of the community and loss of power for one week</li> </ul>	
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> </ul>	<ul style="list-style-type: none"> <li>• Removal of shelter belts and vegetation around the city leads to more ground blizzard conditions in the local area</li> </ul>	
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at fire hall and lift station</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• City located near Interstate 94</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Adopted building codes but lacks enforcement</li> <li>• Dispatch-activated emergency siren</li> <li>• No public school</li> <li>• Presence of three storm shelters</li> </ul>	

Table 8.10.3 – City of Sanborn Jurisdiction Risk Assessment – Continued

Space Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Loss of operation of the city hall, fire hall, lift station, etc.</li> <li>• Loss/outage of medical devices at private residences</li> <li>• Property damage from sewer backups due to loss of lift station</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never a recorded occurrence in Barnes County or North Dakota</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Dependent on solar activity and the 11-year solar cycle</li> <li>• Likely to occur once every 500 years per the 2018 N.D. Enhanced Mitigation MAOP</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> <li>• Lack of permanent generator at fire hall and lift Station</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> <li>• Lack of permanent generator at fire hall and lift Station</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> </ul>
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Table 8.10.3 – City of Sanborn Jurisdiction Risk Assessment – Continued

	<b>Transportation Incident</b>	
<b>Impact</b>	<ul style="list-style-type: none"> <li>Blocked roads from inadequate road clearing</li> <li>Human Injury/Death</li> <li>Increased Fire Potential</li> <li>Loss of Transportation/Accessibility</li> <li>Mass Casualties/Fatalities</li> </ul>	<ul style="list-style-type: none"> <li>Delayed Emergency Response</li> <li>HAZMAT Release</li> <li>Livestock Loss</li> <li>Business Interruptions</li> <li>Property Damage</li> <li>Could be catastrophic if involving a school bus filled with children and a truck carrying hazardous materials</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>Annual occurrences of accidents involving cars and/or farm equipment</li> </ul>	<ul style="list-style-type: none"> <li>Small-to-moderate traffic accident occurring roughly once per year at intersection of county roads 11 and 22</li> </ul>
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Intoxicated drivers</li> <li>High truck traffic from agriculture-related traffic</li> <li>Railroad infrastructure traversing through city limits</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>No commercial passenger airport</li> <li>Decrease in oil trains (from a frequency of one per hour) one the DAPL opened in 2017</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Intoxicated drivers</li> <li>High truck traffic from agriculture-related traffic</li> <li>No hospital or medical clinic</li> <li>Railroad infrastructure traversing through city limits</li> <li>Lack of paved streets</li> <li>Lack of crosswalks, and sidewalks</li> <li>Lack of ordinances restricting use of recreational vehicles in city limits</li> <li>Closing of elevator resulted in the side-track now being used by trains carrying oil and chemicals, which can be parked illegally for several hours at a time</li> <li>City located near Interstate 94</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>No commercial passenger airport</li> <li>Presence of designated truck routes through city limits</li> <li>Installation of street signage in the last seven years</li> </ul>

### 8.10.3 Mitigation Strategy

The Barnes County Multi-Jurisdictional Multi-Hazard Plan Update includes a mitigation strategy consisting of seven goals in Chapter 6. The following problem statement and mitigation projects address the mitigation needs of the city of Sanborn. It should be noted that some mitigation projects that pertain to all jurisdictions are included to encourage county-wide collaboration.

#### **Problem Statement**

The city of Sanborn experiences overland flooding from severe summer weather and severe winter weather as the city's storm water drainage system is inadequate, which impacts critical facilities and infrastructure. The lack of drainage of Sanborn Lake impacts an adjacent freight railroad line and roads leading to the city. Blocked roads occur from severe winter weather and can result in isolation of the city. With a high number of abandoned structures and trailer homes, and a high elderly population, the city is vulnerable to windstorms. The city has little to no capabilities for mitigation and therefore is dependent on outside sources.

Improved drainage, installation of generators at critical facilities and infrastructure, and construction of a storm shelter are a priority for the city.

**City of Sanborn Project 1: Install permanent generators at critical facilities and infrastructure.**

Description/Benefit		Test existing generators and create regularly scheduled maintenance system. Install new generators to establish permanent source of backup power to maintain continued operation of the following critical facilities and infrastructure.  <u>Install New</u> <ul style="list-style-type: none"> <li>• Sanborn City Hall/Community Center</li> <li>• Sanborn Fire Hall (serves as a shelter)</li> <li>• Lift station</li> <li>• Pumphouse</li> </ul>					
Hazards Addressed		All hazards					
Affected Jurisdiction(s)		City of Sanborn					
Project Status		New					
Priority		High					
Responsible Agency		City Council, Public Works, Emergency Services					
Partners		Emergency Management, Public Utilities					
Completion Timeframe		2 to 3 years			Cost	Project-specific	
Funding Source		Public Utilities, Regional Council, RD. FEMA Pre-Disaster Mitigation Grant Program (PDM). State Homeland Security grants.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>			<u>Plan Element Utilized</u>			<u>Process for Integration</u>	
Barnes County LEOP & Mitigation Plan Barnes County THIRA			Capability Assessment, Hazard History, Risk Assessment			Include in city and/or fire department's budget. Apply for grant funding or purchase directly using existing sales tax revenue or budgets. Approval city council or board.	

**City of Sanborn Project 2: Conduct engineering study to identify solutions to update/retrofit storm water drainage system.**

Description/Benefit		<p>Poor drainage blocks access to the fire hall on 6<sup>th</sup> Ave, east side of town by 5<sup>th</sup> Ave, intersection of 5<sup>th</sup> Ave and 6<sup>th</sup> St., intersection of 7<sup>th</sup> St. and 6<sup>th</sup> Ave, intersection of 3<sup>rd</sup> Ave and 4<sup>th</sup> St., multiple culverts throughout city limits.</p> <p>Reduction of damage to critical facilities and infrastructure from annual flooding to assure access for emergency services and continued operation of public infrastructure. Reduce or eliminate damage to people’s homes. Maintain flow of runoff to eliminate standing water blocking roads to maintain access for city residents and emergency services and continued operation of public infrastructure. The study should identify a drainage ditch maintenance system for the city to implement.</p>					
Hazards Addressed		Flood, Infectious Disease, Severe Summer Weather, Severe Winter Weather					
Affected Jurisdiction(s)		City of Sanborn					
Project Status		New/Ongoing and Continue					
Priority		High					
Responsible Agency		City Council, Public Works					
Partners		County Commission, NDAC, NDLC, Regional Council, private contractors, DWR					
Completion Timeframe		2 to 3 years	Cost	Project-specific			
Funding Source		Local budgets. N.D. League of Cities. SWC.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	3	5	5	32
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			City solicits three engineering proposals from qualified firms. Select appropriate firm based on proposals. Apply for grant funding. Execute project. Submit reimbursements and close-out grant.		

#### 8.10.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: administrative and technical, education and outreach, financial, and planning and regulatory. Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. **Tables comparing the mitigation capabilities of the city of Sanborn with all other jurisdictions in Barnes County can be found below and in Chapter 7, County Mitigation Capability Assessment.**

- Administrative and Technical: Identification of administrative and technical capabilities, which include staff, their skills and tools for mitigation planning to implement specific mitigation actions.
- Education and Outreach: Identification of education and outreach programs, and methods already in place to implement mitigation activities and communicate hazard-related information.
- Financial: Identification of access to or eligibility to use funding resources for hazard mitigation for jurisdictions.
- Planning and Regulatory: Jurisdictional plans, policies, codes, and ordinances adopted and in place that prevent and reduce the impacts of hazards.

#### City of Sanborn Mitigation Capabilities

Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. Information on the capabilities of the city was gathered at its jurisdictional meeting, committee meetings, and interviews during the planning process.

#### Administrative and Technical

The following narrative details the administrative and technical capabilities of the city of Sanborn.

The city of Sanborn has an active city council. The city does not have a chief building official or inspector. The county LEPC serves the city. The city does not have a civil engineer but can contract with a private firm when services are needed. The county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning, grant writing and grant administration services. However, the county's emergency manager is a member of the city council and can write and administer grants. The city council and auditor also have administration capabilities. Infrastructure maintenance is conducted on an as-needed basis. The city is part of the county-wide mutual aid agreement for emergency services. The city has an emergency siren located at the fire hall. The city has a generator at the water tower. The fire ISO rating for the city is six. The city has a fire index sign located at the fire hall. Emergency services are not GIS capable. The fire chief and assistant fire chief report hazard data to the emergency manager. The city is not Firewise or StormReady Certified.

### **Education and Outreach**

The following narrative details the education and outreach capabilities of the city of Sanborn.

The city does not have non-profit organizations providing education on hazards but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. Didiers Ag Center conducts hazard education for employees, but not the public. The city also has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city also has an annual “smoker” event where hazard education is provided. There are no public-private partnerships providing education and outreach on hazards. The county’s emergency manager conducts education and outreach on hazards in the city.

### **Financial**

The following narrative details the financial capabilities of the city of Sanborn.

The city does not set aside tax revenue for capital improvements and only has a general fund. The city does not have storm water utility fee as it lacks a storm water system. The city does charge a monthly sanitary sewer fee which is placed on the water/sewer/garbage bill. The city does not levy special assessments for new development but can do so if warranted. The city issued a bond to pay for a new pump house in recent years and can incur debt through general obligation bonds or special tax bonds in the future if needed. The city issues building permits. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

### **Planning and Regulatory**

The following narrative details the planning and regulatory capabilities of the city of Sanborn.

The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county’s local emergency operations plan and flood management plan, and the county road department’s transportation plan. The city does not have a continuity of operations plan. The city recently updated its zoning but does not have subdivision ordinances or impact fees. The city issues building permits for \$5. The city council serves as the planning commission for the city. The city adopted state building codes but does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study but does have a flood insurance study. The city is covered under the County’s Pandemic Influenza Response Plan.

#### **8.10.5 Integration of Mitigation Plan into Planning Mechanisms**

Integration of the plan into current planning mechanisms is critical in mitigation to communicate the needs of each jurisdiction to achieve an all-inclusive mitigation strategy. The process for integration of



the mitigation plan is included after each mitigation project, which shows the planning mechanism utilized, the plan element used for integration and the process for integration.

### **8.10.6 Plan Maintenance**

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.

## 8.11 City of Sibley, North Dakota

The following profile includes information specific to the city of Sibley for mitigation planning purposes. The information included is as follows:

- Profile and Inventory;
- Risk Assessment;
- Hazard Scoring Notes;
- Mitigation Projects, and
- Capabilities for Mitigation.

### **Integration into Planning Mechanisms**

The process for integration of the mitigation plan into existing planning mechanisms is discussed at the bottom of each mitigation project in section 8.11.3, in section 8.11.4, and in Chapter 6, Mitigation Strategy.

### **Plan Maintenance**

Plan maintenance is shown in section 8.11.6.

### **Critical Facilities and Infrastructure**

Figure 8.11.1 is a map of the city of Sibley provided by Barnes County Emergency Management.

Figure 8.11.1 – City of Sibley, North Dakota



Source(s): Barnes County Emergency Management

**8.11.1 Profile and Inventory**

The location, total population, vulnerable populations, housing units and household size, businesses, critical facilities and infrastructure, new and future development, services, jurisdictional buildings, emergency response services and utilities are shown for the city of Sibley. Detailed narratives follow each section heading to profile the city.

Detailed information on public buildings, services provided, emergency response services and utilities can be found can be found in Chapter 3, Profile and Inventory.

**Location**

The city of Sibley is located on N.D. Highway 26 the west side of Lake Ashtabula, approximately 20 miles north of Valley City in Barnes County.

**Population**

Table 8.11.1 shows population trends for the city of Sibley from 1920 to 2010, with an estimate for 2019.

Per the 2010 U.S. Decennial Census, the city of Sibley has a population of 30 people, which is a decrease of 16 people (34.8 percent) from 46 people in 2000.

**Table 8.11.1 – 1920 to 2010 City of Sibley, North Dakota Population Statistics**

1920	1930	1940	1950	1960	1970	1980	1990	2000	2010	2019 (est.)
--	--	--	--	22	20	21	41	46	30	28

Source(s): U.S. Decennial Census; American Community Survey, 5-Year Estimates

**Vulnerable Populations**

Age. Per the 2015 to 2019 American Community Survey 5-Year Estimate, the population of the city of Sibley consists of eight individuals under the age of 20 and seven individuals aged 65 and older.

Daycares. There are no daycares in the city of Sibley.

Poverty. Per the 2015 to 2019 American Community Survey 5-Year Estimate, there are 12 households in the city of Sibley that live below the poverty line.

Public Schools. There is not a public school in the city of Sibley.

Senior Housing Developments/Care Centers. There are no age-restricted, senior housing developments, or care centers in the city of Sibley.

**Housing Units and Household Size**

The 2015 to 2019 American Community Survey 5-Year Estimate shows there is a total of 66 housing units in the city consisting of 34 single-family homes, eight mobile/RV homes, and 24 multifamily homes. According to the city of Sibley, there are 40 housing units in the city consisting of 24 single-family homes, eight mobile/RV homes, and eight multifamily homes.

The 2015 to 2019 American Community Survey 5-Year Estimate shows there are 27 households in the city of Sibley resulting in an average household size of 1.63 people.

### **Businesses**

There are no major employers in the city of Sibley. Additional information on businesses and economic development in the city of Sibley or can be obtained by contacting the Valley City-Barnes County Development Group.

### **New and Future Development**

New development is considered any development occurring since the 2015 Barnes County Multi-Hazard Mitigation Plan. Future development is considered any development that is planned, pending, or proposed. No new or future development was identified at the time of this plan update.

### **Buildings, Critical Facilities and Infrastructure, and Services and Utilities Provided**

The following section profiles the housing units, services, emergency response services, jurisdictional buildings, and utilities of the city of Sibley. Tables 3.10 to 3.13 in Chapter 3, Profile and Inventory show a complete inventory of this information for Barnes County and incorporated jurisdictions. An “X” indicates if the jurisdiction offers the utility or service (either through contract or employees) or possesses the building or resource. Narratives detailing information for the county and incorporated jurisdictions accompany each table.

Structures. Housing units show where populations are located. Table 3.9 in Chapter 3, Profile and Inventory shows the number of single-family, mobile home structures, and multifamily and in Barnes County and incorporated jurisdictions. The following are key points for the city of Sibley:

- There are 34 single-family housing units comprising 51.5 percent of all housing units in the city of Sibley.
- There are eight Mobile/Boat/RV/Van homes comprising 12.1 percent of all housing units in the city of Sibley
- There are 24 Multifamily housing units comprising 36.4 percent of all housing units in the city of Sibley.

Critical Facilities. The following facilities were identified as critical in the city of Sibley.

- Sibley Fire Hall (also serves as the city hall/community center and storm shelter).

Infrastructure. The following infrastructure was identified as critical in the city of Sibley.

- The city of Sibley has a sanitary sewer system with a lagoon cell, and a lift station adjacent to the fire hall. There are no septic systems in the city of Sibley.
- The city is of Sibley is located on N.D. Highway 26.

Emergency Response Services. The following emergency response services were identified in the city of Sibley.

- Barnes County Ambulance provides ambulance services to the city of Sibley.
- The Sibley Fire Department provide fire protection to the city and surrounding area.
- The Barnes County Sherriff's Office provides law enforcement services to the city of Sibley.
- The city does not have any first responders.
- The nearest hospital is CHI-Mercy Hospital in Valley City.
- City-County Health District is in the city of Valley City and provides public health services to the city of Sibley.

Services and Utilities. The following services are provided in the city of Sibley.

- Brager Disposal Services, Inc. provides garbage collection services to the city of Sibley.
- The city of Sibley maintains an inert landfill next to the lagoon cell.
- The city of Sibley has a sanitary sewer system with a lagoon cell, and a lift station adjacent to the fire hall. There are no septic systems in the city of Sibley.
- The city has a storm water system consisting of drainage ditches.
- The Valley City Times-Record is the official newspaper of the city of Sibley.
- Dakota Rural Water District provides drinking/potable water to the city of Sibley.
- Electricity is provided by Otter Tail Power.
- Natural gas is not available in the city.
- Fuel oil, propane, and electricity are used as an alternative heating source and is provided by companies chosen by the individual consumer.
- BEK provides phone and internet.

### 8.11.2 Risk Assessment and Hazard Scoring Notes

Table 8.11.2 summarizes the risk assessment scoring of the city of Sibley. The risk assessment and hazard scoring notes for each hazard specific to the city are shown in Table 8.11.3. Risk assessment notes for impact, frequency, likelihood and vulnerability ubiquitous for jurisdictions in Barnes County are found in Chapter 4, Threat and Hazard Identification Assessment in each respective hazard profile.

**Table 8.11.2 – City of Sibley Jurisdiction Risk Assessment Scoring Summary**

<b>Risk Assessment</b>							<b>Jurisdiction: City of Sibley</b>						
<b><u>Natural Hazard</u></b>	<b><u>Impact</u></b>	<b><u>Frequency</u></b>	<b><u>Likelihood</u></b>	<b><u>Vulnerability</u></b>	<b><u>Capabilities</u></b>	<b><u>Total</u></b>							
Drought	2	2	2	2	1	7							
Fire – Urban/Structure Collapse	3	2	4	3	1	11							
Fire – Wildland (Rural)	4	2	3	4	1	12							
Flood	4	3	4	4	1	14							
Geologic Hazard	4	2	4	4	1	13							
Infectious Disease	4	2	2	3	1	10							
Severe Summer Weather	4	2	3	4	1	12							
Severe Winter Weather	4	4	4	3	1	14							
Space Weather	4	1	2	1	1	7							
<b><u>Adversarial Threats</u></b>													
Civil Disturbance	4	2	1	3	1	9							
Criminal, Terrorist or Nation-State Attack	4	2	1	3	1	9							
Cyberattack	4	1	2	2	1	8							
<b><u>Technological Threats</u></b>													
Dam Failure	4	2	2	3	1	10							
Hazardous Material Release	4	2	1	2	1	8							
Transportation Incident	3	2	2	3	1	9							

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 8.11.3 – City of Sibley Jurisdiction Risk Assessment

	<b>Civil Disturbance</b>	
<b>Impact</b>	<ul style="list-style-type: none"> <li>Blocked Roads</li> <li>Business Interruptions</li> <li>Delayed Emergency Response</li> <li>Financial Hardship/Strain (public)</li> </ul>	<ul style="list-style-type: none"> <li>HAZMAT Release – oil trains and natural gas pipeline</li> <li>Human Injury/Death</li> <li>Property Damage (Structure)</li> <li>Property Damage (Vehicle)</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>Never an occurrence of a major incident</li> </ul>	<ul style="list-style-type: none"> <li>DAPL protesters were not active in the city</li> </ul>
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No railroad infrastructure or pipelines</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No railroad infrastructure or pipelines</li> </ul>



Table 8.11.3 – City of Sibley Jurisdiction Risk Assessment – Continued

Criminal, Terrorist, Nation-State Attack			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> <li>• Human Injury/Death</li> <li>• Property Damage (Structure)</li> <li>• Property Damage (Vehicle)</li> </ul> <ul style="list-style-type: none"> <li>• <b>Threats to city water supply</b></li> <li>• Mass Casualties/Fatalities</li> <li>• Loss of Communication Systems</li> <li>• Disease Outbreak/Mass Infections</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No occurrences</li> <li>• Miscellaneous property damage occurring in the city on an occasional basis</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No railroad infrastructure or pipelines</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No railroad infrastructure or pipelines</li> </ul>
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<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No railroad infrastructure or pipelines</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No railroad infrastructure or pipelines</li> </ul>
<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No railroad infrastructure or pipelines</li> </ul>		

Table 8.11.3 – City of Sibley Jurisdiction Risk Assessment – Continued

	Cyberattack	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> </ul>	<ul style="list-style-type: none"> <li>• Human Injury/Death</li> <li>• School Closure</li> <li>• <b>Loss of Communication Systems</b></li> <li>• Identity Theft – loss of wages and/or assets</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never an occurrence of a major attack</li> </ul>	
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No railroad infrastructure or pipelines</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Elderly population relying largely on landlines for communication purposes, remote medical care and equipment monitoring</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No public school</li> <li>• No railroad infrastructure or pipelines</li> </ul>

Table 8.11.3 – City of Sibley Jurisdiction Risk Assessment - Continued

Drought	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Loss of Economy</li> <li>• Loss of Livestock</li> <li>• Loss of Wildlife Habitat (decreased wildlife populations)</li> <li>• Increase in Wildland Fire Potential</li> </ul> <ul style="list-style-type: none"> <li>• Water quality compromised from stock dams</li> <li>• Diminished soil quality – salinity will increase</li> <li>• Negative impact on mental health of producers and fire responders – “community impact”</li> <li>• Local producers forced to sell off herds which can last for several years</li> <li>• Population loss as people moved away due to loss of economy</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Severe Drought of 1961/1962, 1988/1989 to 1991/1992</li> <li>• Summer of 2017, local producers forced to sell off portions of their herds</li> </ul> <ul style="list-style-type: none"> <li>• End of July through winter of 2016 – county reached severe drought status</li> <li>• Severe drought in summer/fall of 2020</li> </ul>
<b>Likelihood</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Dry/wet cycle every five to eight years</li> <li>• Climatic patterns will result in an eventual drought of significance</li> <li>• Lack of precipitation</li> </ul> </div> <div style="width: 45%;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Heavy precipitation</li> <li>• Located on an aquifer with plenty of available water</li> </ul> </div> </div>
<b>Vulnerability</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Wildlife &amp; hunting economy</li> <li>• Agriculture economy</li> <li>• Elderly population</li> <li>• Flat terrain/open topography contributes to conditions</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• City does not have a water tower</li> <li>• City does not have a fire index sign</li> </ul> </div> <div style="width: 45%;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Financial assistance programs made available by the state and federal government</li> <li>• Burn Ban by county emergency management</li> <li>• Fire Index monitoring and mapping from NDDDES</li> <li>• Advanced communications such as internet and TV</li> <li>• Located on an aquifer with plenty of available water</li> </ul> </div> </div>

Table 8.11.3 – City of Sibley Jurisdiction Risk Assessment - Continued

Fire – Urban Fire/Structure Collapse			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• HAZMAT Release</li> </ul> <ul style="list-style-type: none"> <li>• Human Injury/Death</li> <li>• Increase Fire Potential</li> <li>• Property damage on a significant scale if impacting downtown structures</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No incidents of building fires or structures</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Age of structures on main street</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• Lack of building codes and enforcement</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Age of structures on main street</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• Lack of building codes and enforcement</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> </ul>
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<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Age of structures</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• Fire Hall does not have a permanent or portable generator</li> <li>• Prolonged response times due to limited fire staff during the daytime</li> <li>• Lack of building codes and enforcement</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> <li>• No railroad infrastructure</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Age of structures</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• Fire Hall does not have a permanent or portable generator</li> <li>• Prolonged response times due to limited fire staff during the daytime</li> <li>• Lack of building codes and enforcement</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> <li>• No railroad infrastructure</li> </ul>
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Table 8.11.3 – City of Sibley Jurisdiction Risk Assessment – Continued

Fire – Rural & Wildland			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Crop Loss</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• Increase Fire Potential</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Mass Casualties</li> <li>• Losses could be on a significant scale if impacting a major producer or farmstead</li> <li>• Loss of farm equipment and assets</li> <li>• Loss of Livestock</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Farmers don't do much control burning</li> <li>• No reports of lightning impacting vegetation and causing a fire</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> <li>• No railroad infrastructure</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> <li>• No railroad infrastructure</li> </ul>
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Table 8.11.3 – City of Sibley Jurisdiction Risk Assessment – Continued

		Flood	
Impact	<ul style="list-style-type: none"> <li>Blocked Roads</li> <li>Delayed Emergency Response</li> <li>Flooding (Highway &amp; Structure)</li> <li>Human Injury/Death</li> <li>Property Damage / Sewer Backup</li> <li><b>Runoff from buildings causes overland flooding</b></li> </ul>	<ul style="list-style-type: none"> <li>Impacts lift station and causes sewer backups</li> <li>Fire hall experiences seepage</li> <li>Straw from feedlots and other debris is washed into town causing blockage of flood gates</li> <li>Potential mold issues due to humidity and location right on Lake Ashtabula</li> </ul>	
Frequency	<ul style="list-style-type: none"> <li>Depends largely on the weather</li> <li>High water table</li> <li>Flash flooding occurs from heavy precipitation</li> </ul>	<ul style="list-style-type: none"> <li>Sump pumps are constantly in homes with basements constantly</li> <li>Severe overland flooding from heavy rains occurring once every 3 to 5 years</li> <li>Experienced 7-inch downpour in 2004</li> </ul>	
Likelihood	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Rapid change of seasons resulting in excessive snow melt</li> <li>High water table</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>Dry seasons and low precipitation</li> <li>City performs storm water drainage maintenance</li> <li>Installation of drain tile at city park</li> </ul>	
Vulnerability	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Rapid change of seasons resulting in excessive snow melt</li> <li>High water table</li> <li>Local topography of the city with closed basins</li> <li>City is not enrolled in the NFIP</li> <li>City does not have flood ordinances</li> <li>Surrounding topography contributes to large flow of stormwater into the city – needs a levee on the west side</li> <li>Lack of storm water system</li> <li>Local terrain with the city located at the bottom of the hill and on the water allows runoff to run right through the city</li> <li>Home and properties having rail ties as foundations – few have property footings</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>Alternate routes were identified for townships roads</li> <li>City performs storm water drainage maintenance</li> <li>Installation of drain tile at city park</li> <li>Residents possess equipment for cleanup of debris</li> </ul>	

Table 8.11.3 – City of Sibley Jurisdiction Risk Assessment – Continued

	Geologic Hazard	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Delayed Emergency Response</li> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of Power</li> <li>• Property Damage</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No incidents involving geologic hazards in or near city limits</li> </ul>	
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> <li>• Surrounding topography experiences large amount of runoff from heavy precipitation</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> <li>• Location of city utility on the hillside and through the city</li> <li>• Location of the town on the water at the bottom of the hill</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul>

Table 8.11.3 – City of Sibley Jurisdiction Risk Assessment – Continued

Hazardous Material Release	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Delayed Emergency Response / Increased Fire Potential</li> <li>• Environmental Degradation</li> <li>• Evacuation (localized)</li> <li>• Explosion</li> </ul> <ul style="list-style-type: none"> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> <li>• Loss of Potable Water</li> <li>• Loss of Power</li> <li>• Property Damage</li> <li>• Increased risk of HAZMAT release and/or transportation incidents due to increased oil train traffic and trucks</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Small incidents of leaking anhydrous tanks bi-annually</li> <li>• Never any major spills reported</li> <li>• Never a pipeline leak</li> </ul> <ul style="list-style-type: none"> <li>• Train hauling toilet paper, four wheelers, laundry detergent and other cargo derailed north of the city 5 miles on the Karnak High Bridge in 2006</li> </ul>
<b>Likelihood</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> </ul> </div> <div style="width: 45%;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> <li>• No railroad infrastructure</li> <li>• No trucks allowed on city streets</li> <li>• No pipelines</li> </ul> </div> </div>
<b>Vulnerability</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Agriculture economy and related industries</li> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• <b>No hospital or medical clinic in city limits</b></li> <li>• <b>Manual-activated emergency siren</b></li> </ul> </div> <div style="width: 45%;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Fire departments have some HAZMAT training</li> <li>• <b>Manual-activated emergency siren</b></li> <li>• No railroad infrastructure</li> <li>• No trucks allowed on city streets</li> <li>• No pipelines</li> <li>• No chemicals stored in the city</li> </ul> </div> </div>



Table 8.11.3 – City of Sibley Jurisdiction Risk Assessment – Continued

Infectious Disease	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Human Injury/Death</li> <li>• Livestock Loss</li> <li>• Loss of Economy</li> <li>• Mass Casualties</li> </ul> <ul style="list-style-type: none"> <li>• Strain on local medical resources (ambulance)</li> <li>• Loss of medical staff due to sickness</li> <li>• Loss of Potable Water</li> <li>• Financial cost to public health resources</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Annual occurrences of death, primarily among the elderly</li> <li>• Occurrence of disease - 1 in 3 for people annually</li> <li>• Annual occurrences of influenza cases in the local population</li> </ul> <ul style="list-style-type: none"> <li>• <b>The COVID-19 Pandemic of 2020 resulted in mass quarantine and sheltering of the local population and temporary closure of businesses</b></li> </ul>
<b>Likelihood</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• Dependent on weather for animals and crops</li> <li>• Transporting of animals across state lines</li> </ul> </div> <div style="width: 45%;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> </ul> </div> </div>
<b>Vulnerability</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• Transporting of animals across state lines</li> <li>• No hospital or medical clinic</li> <li>• No vet clinic in city limits</li> <li>• Presence of abandoned buildings</li> <li>• Campgrounds with high levels of vegetation</li> <li>• Small population of stray animals and local wildlife may cause transmission of disease</li> </ul> </div> <div style="width: 45%;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> <li>• Immunizations &amp; medications of local population</li> <li>• No care center in the city</li> <li>• No public school</li> </ul> </div> </div>

Table 8.11.3 – City of Sibley Jurisdiction Risk Assessment – Continued

Severe Summer Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – heat exhaustion</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> <li>• Docks and board damaged or tipped over</li> <li>• Vehicle Damage</li> <li>• Loss of Livestock</li> <li>• Loss of Crops</li> <li>• Loss of Power/Downed Power Lines -</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Property damage from tornados/straight-line winds in summer 2017 and 2019</li> <li>• Windstorms occurring annually</li> <li>• Annual occurrences of hailstorms</li> <li>• Two or three significant storms producing damage to trees and property annually</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at community center, fire hall, and lift station</li> <li>• Lack of building codes and enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of adequate storm water drainage system</li> <li>• Lack of basements</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> <li>• City maintains an inert landfill</li> <li>• Due to the topography, tornadoes do not touch down and instead travel over the city</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at community center, fire hall, and lift station</li> <li>• Lack of building codes and enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of adequate storm water drainage system</li> <li>• Lack of basements</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> <li>• City maintains an inert landfill</li> <li>• Due to the topography, tornadoes do not touch down and instead travel over the city</li> </ul>
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Table 8.11.3 – City of Sibley Jurisdiction Risk Assessment – Continued

Severe Winter Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – wind chill</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> <li>• Loss of Crops</li> <li>• Loss of Livestock</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> <li>• Vehicle Damage</li> <li>• <b>Infrastructure Degradation</b></li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• March 2017 snowstorm resulted in blocked roads throughout the city</li> <li>• Spring snowstorm of 2019</li> <li>• Annual occurrences of power loss from storms</li> <li>• Two or three significant blizzards producing damage to trees and property annually</li> <li>• Happens yearly, weather and climate in the area.</li> <li>• High winds and ground blizzard conditions</li> <li>• Heavy snow each year</li> <li>• Geography of the city allows for snow to fill city streets with snow</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at fire hall and lift station</li> <li>• Lack of building codes and enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of adequate storm water drainage system</li> <li>• Bridge over Lake Ashtabula can become blocked from heavy snow blowing of the lake</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> </ul> </td> </tr> </table>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at fire hall and lift station</li> <li>• Lack of building codes and enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of adequate storm water drainage system</li> <li>• Bridge over Lake Ashtabula can become blocked from heavy snow blowing of the lake</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> </ul>
<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at fire hall and lift station</li> <li>• Lack of building codes and enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of adequate storm water drainage system</li> <li>• Bridge over Lake Ashtabula can become blocked from heavy snow blowing of the lake</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> </ul>		

Table 8.13.3 – City of Wimbledon Jurisdiction Risk Assessment – Continued

Space Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Loss of operation of the community center, fire hall, lift station, etc.</li> <li>• Loss/outage of medical devices at private residences</li> <li>• Property damage from sewer backups due to loss of lift station</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never a recorded occurrence in Barnes County or North Dakota</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Dependent on solar activity and the 11-year solar cycle</li> <li>• Likely to occur once every 500 years per the 2018 N.D. Enhanced Mitigation MAOP</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> <li>• Lack of permanent generator at fire hall and lift station</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> <li>• Lack of permanent generator at fire hall and lift station</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> </ul>
<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> <li>• Lack of permanent generator at fire hall and lift station</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> </ul>		

Table 8.13.3 – City of Wimbledon Jurisdiction Risk Assessment – Continued

	Transportation Incident	
<b>Impact</b>	<ul style="list-style-type: none"> <li>Blocked roads from inadequate road clearing</li> <li>Human Injury/Death</li> <li>Increased Fire Potential</li> <li>Loss of Transportation/Accessibility</li> <li>Mass Casualties/Fatalities</li> </ul>	<ul style="list-style-type: none"> <li>Delayed Emergency Response</li> <li>HAZMAT Release</li> <li>Livestock Loss</li> <li>Business Interruptions</li> <li>Property Damage</li> <li>Could be catastrophic if involving a school bus filled with children and a truck carrying hazardous materials</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>Annual occurrences of accidents involving cars and/or farm equipment</li> </ul>	<ul style="list-style-type: none"> <li>No major car, truck or train accidents</li> <li>No boating, jet skis or watercraft accidents</li> <li>Train hauling toilet paper, four wheelers, laundry detergent and other cargo derailed north of the city 5 miles on the Karnak High Bridge in 2006</li> </ul>
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Intoxicated drivers</li> <li>High truck traffic from agriculture-related traffic in the area</li> <li>Seasonal population on Lake Ashtabula for recreation purposes</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>No commercial passenger airport</li> <li>Signs prohibiting trucks from traveling on city streets</li> <li>Construction of new highway bridge carrying N.D. Highway 26 over Lake Ashtabula is higher and wider and therefore reduces the potential for boating accidents</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Intoxicated drivers</li> <li>High truck traffic from agriculture-related traffic</li> <li>No hospital or medical clinic</li> <li>Lack of paved streets</li> <li>Lack of street signage, crosswalks, and sidewalks</li> <li>Seasonal population on Lake Ashtabula for recreation purposes</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>No commercial passenger airport</li> <li>Truck prohibited from traveling on city streets</li> <li>Construction of new highway bridge carrying N.D. Highway 26 over Lake Ashtabula is higher and wider and therefore reduces the potential for boating accidents</li> <li>Lack of railroad infrastructure</li> </ul>

### 8.11.3 Mitigation Strategy

The Barnes County Multi-Jurisdictional Multi-Hazard Plan Update includes a mitigation strategy consisting of seven goals in Chapter 6. The following problem statement and mitigation projects address the mitigation needs of the city of Sibley. It should be noted that some mitigation projects that pertain to all jurisdictions are included to encourage county-wide collaboration.

#### **Problem Statement**

Due to its location on Lake Ashtabula, the city of Sibley has a permanent population of around 30 residents and a temporary population from May to September of 300 residents for recreation. The city lacks a storm shelter for seasonal populations. The city also experiences overland flooding issues due to surrounding topography. Critical facilities and infrastructure lack permanent generators for backup power sources. The city's outdoor emergency alerting system is manually activated. With little to no capabilities other than a drought management plan, the city is dependent on outside sources for mitigation.

Engineering of measures to mitigation overland flooding, installation of generators at critical facilities and infrastructure, upgrading of the outdoor early warning system, and a storm shelter are a priority for the city.

**City of Sibley Project 1: Conduct engineering study to identify scope of work for a levee.**

Description/Benefit	Construct of a levee on west of the city that is five feet wide, two feet high and a ½ mile long is needed to divert runoff from surrounding hillsides. Diversion of runoff to eliminate overland flooding issues impacting permanent and temporary residences, the lift station and fire hall to ensure continued operation of the sanitary sewer system and emergency services.						
Hazards Addressed	Flood, Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	City of Sibley						
Project Status	New/Ongoing and Continue						
Priority	High						
Responsible Agency	City Council, DWR, Public Works						
Partners	County Commission, township board, USACE						
Completion Timeframe	2 to 3 years	Cost	Project-specific				
Funding Source	Local budgets. DWR.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	1	5	5	30
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			City solicits three engineering proposals from qualified firms. Select appropriate firm based on proposals. Apply for grant funding. Execute project. Submit reimbursements and close-out grant.		

**City of Sibley Project 2: Install permanent generators at critical facilities and infrastructure.**

Description/Benefit		Test existing generators and create regularly scheduled maintenance system. Install new generators to establish permanent source of backup power to maintain continued operation of the following critical facilities and infrastructure.  <u>Install New</u>					
		<ul style="list-style-type: none"> <li>• Sibley Fire Hall</li> <li>• Lift stations</li> </ul>					
Hazards Addressed		All hazards					
Affected Jurisdiction(s)		City of Sibley					
Project Status		New					
Priority		High					
Responsible Agency		City Council, Emergency Services, Public Work					
Partners		Emergency Management, Public Utilities					
Completion Timeframe		2 to 3 years			Cost	Project-specific	
Funding Source		Public Utilities, Regional Council, RD. FEMA Pre-Disaster Mitigation Grant Program (PDM). State Homeland Security grants.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>			<u>Plan Element Utilized</u>			<u>Process for Integration</u>	
Barnes County LEOP & Mitigation Plan Barnes County THIRA			Capability Assessment, Hazard History, Risk Assessment			Include in city and/or fire department's budget. Apply for grant funding or purchase directly using existing sales tax revenue or budgets. Approval city council or board.	



**City of Sibley Project 3: Upgrade manually-activated outdoor emergency siren.**

Description/Benefit		The city’s outdoor emergency siren is manually activated and needs to be upgraded to provide radio-activation/dispatch-activation.					
Hazards Addressed		All					
Affected Jurisdiction(s)		City of Sibley					
Project Status		Ongoing and Continue					
Priority		Very High					
Responsible Agency		City Council, Emergency Services					
Partners		County Commission, Emergency Management, NDAC, NDLC, Regional Council					
Completion Timeframe		2 to 3 years	Cost	Up to \$25,000 per siren			
Funding Source		Local budgets. N.D. League of Cities. State Homeland Security Grants. NDDDES.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Include in city and/or fire department’s capital improvement plan. Apply for grant funding or purchase directly using existing sales tax revenue or budgets. Approval city council or board.		

#### 8.11.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: administrative and technical, education and outreach, financial, and planning and regulatory. Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. **Tables comparing the mitigation capabilities of the city of Sibley with all other jurisdictions in Barnes County can be found below and in Chapter 7, County Mitigation Capability Assessment.**

- Administrative and Technical: Identification of administrative and technical capabilities, which include staff, their skills and tools for mitigation planning to implement specific mitigation actions.
- Education and Outreach: Identification of education and outreach programs, and methods already in place to implement mitigation activities and communicate hazard-related information.
- Financial: Identification of access to or eligibility to use funding resources for hazard mitigation for jurisdictions.
- Planning and Regulatory: Jurisdictional plans, policies, codes, and ordinances adopted and in place that prevent and reduce the impacts of hazards.

#### City of Sibley Mitigation Capabilities

Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. Information on the capabilities of the city was gathered at its jurisdictional meeting, committee meetings, and interviews during the planning process.

#### Administrative and Technical

The following narrative details the administrative and technical capabilities of the city of Sibley.

The city of Sibley has an active city council. The city does not have a chief building official or inspector. The county LEPC serves the city. The city does not have a civil engineer but can contract with a private firm when services are needed. The county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning, grant writing and grant administration services. However, the auditor, mayor and city council have grant writing capabilities as an arbor day grant was written by staff and awarded. The city conducts an annual clean up with additional infrastructure maintenance conducted on an as-needed basis. The city is part of the county-wide mutual aid agreement for emergency services. The city has an emergency siren located at the fire hall, but it is not adequate as it is manually activated. The city does not have any generators. The fire ISO rating for the city is nine. The city does not have a fire index sign. Emergency services are not GIS capable. The fire chief reports hazard data to the emergency manager. The city is not Firewise or StormReady Certified.

### **Education and Outreach**

The following narrative details the education and outreach capabilities of the city of Sibley.

The city does not have non-profit organizations providing education on hazards but has access to the NDSU/Barnes County Extension Service. The city does not maintain a website with hazard education. A website with hazard education is available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. The Sodbusters, a monthly social club, provides education and outreach on hazards. The city also has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

### **Financial**

The following narrative details the financial capabilities of the city of Sibley.

The city does not set aside tax revenue for capital improvements and only has a general fund. The city does not have storm water utility fee as it lacks a storm water system. The city charges a monthly sanitary sewer fee of \$60.50, which is placed on the water/sewer/garbage bill. The city does not levy special assessments for new development but can do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also can do so if warranted. The city issues building permits. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

### **Planning and Regulatory**

The following narrative details the planning and regulatory capabilities of the city of Sibley.

The city does not have a comprehensive, strategic, capital improvements, land use, water conservation or storm water plan. The city does have a drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city has zoning in place dating back to the 1960s. The city is considering updating its zoning in 2015. The city does not have subdivision ordinances or impact fees. The city issues building permits for development. The city council serves as the planning commission for the city. The city has not adopted state building codes and does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

### **8.11.5 Integration of Mitigation Plan into Planning Mechanisms**

Integration of the plan into current planning mechanisms is critical in mitigation to communicate the needs of each jurisdiction to achieve an all-inclusive mitigation strategy. The process for integration of the mitigation plan is included after each mitigation project, which shows the planning mechanism utilized, the plan element used for integration and the process for integration.

### **8.11.6 Plan Maintenance**

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.

## 8.12.2 City of Valley City, North Dakota Risk Assessment and Hazard/Threat Scoring Notes

Table 8.12.2.1 summarizes the risk assessment scoring of the city of Valley City. The risk assessment and hazard scoring notes for each hazard specific to the city are shown in Table 8.12.2. Risk assessment notes for impact, frequency, likelihood and vulnerability ubiquitous for jurisdictions in Barnes County are found in Chapter 4, Threat and Hazard Identification Assessment in each respective hazard profile.

**Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment Scoring Summary**

<b>Risk Assessment</b>							<b>Jurisdiction: City of Valley City</b>					
<b><u>Natural Hazard</u></b>	<b><u>Impact</u></b>	<b><u>Frequency</u></b>	<b><u>Likelihood</u></b>	<b><u>Vulnerability</u></b>	<b><u>Capabilities</u></b>	<b><u>Total</u></b>						
Drought	1	2	2	2	3	4						
Fire – Urban/Structure Collapse	4	3	3	3	2	11						
Fire – Wildland (Rural)	4	4	4	3	2	13						
Flood	2	3	3	2	4	6						
Geologic Hazard	3	2	3	3	1	10						
Infectious Disease	4	3	3	3	3	10						
Severe Summer Weather	4	4	4	2	3	11						
Severe Winter Weather	4	4	4	2	3	11						
Space Weather												
<b><u>Adversarial Threats</u></b>												
Civil Disturbance	4	2	2	3	3	8						
Criminal, Terrorist or Nation-State Attack	4	2	3	4	3	10						
Cyberattack	4	3	4	2	3	10						
<b><u>Technological Threats</u></b>												
Dam Failure	4	1	1	4	2	8						
Hazardous Material Release	4	2	3	4	1	12						
Transportation Incident	4	4	4	4	1	15						

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment

Civil Disturbance			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads &amp; Delayed Emergency Response</li> <li>• Business &amp; Government Interruptions</li> <li>• Financial Hardship/Strain (private &amp; public)</li> <li>• HAZMAT Release</li> <li>• Human Injury/Death</li> <li>• Psychological/mental stress of citizens and local government employees)</li> <li>• Potential loss of economy, livestock and life</li> <li>• Disruption of services to maintain economic activity/society</li> <li>• Property Damage (Structure &amp; Vehicle) – graffiti/vandalism</li> </ul> <ul style="list-style-type: none"> <li>• <b>Financial drain and reduced productivity in local government performing normal city services as they become overwhelmed during an incident</b></li> </ul> <p><b>The following impacts were realized to Barnes County through mutual aid during the DAPL protest between September 2016 and February 2017:</b></p> <ul style="list-style-type: none"> <li>• <b>Personnel Costs: \$1,303.40</b></li> <li>• <b>Food/Lodging Costs: \$163.80</b></li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• DAPL protest from August 10, 2016, to March 31, 2017, lasting approximately seven+ months</li> <li>• Starting in beginning of 2020, a resident of Valley City “protests” daily at the Valley City Police Department. Local law enforcement indicated the individual has been arrested in the past. The individual has a condition of bond to maintain a specific distance from the adjacent “Thrifty Shop” that provides services and employment opportunities to people with special needs. The individual has assaulted people in front of the police department building.</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Presence of energy pipelines and related infrastructure</li> <li>• Presence of full-time city of Valley City Police Department and Barnes County Sheriff’s Office can attract activity</li> <li>• Increasing instability within the federal government</li> <li>• Presence of railroad infrastructure traversing city limits</li> <li>• Presence of Valley City State University</li> <li>• Interstate 94</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Presence of full-time city of Valley City Police Department and Barnes County Sheriff’s Office can attract activity</li> <li>• City not located near a major metropolitan population, international airport, stadium, or international tourist attraction</li> <li>• Public safety comm. (Public Safety Answering Points)</li> </ul> </td> </tr> </table>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Presence of energy pipelines and related infrastructure</li> <li>• Presence of full-time city of Valley City Police Department and Barnes County Sheriff’s Office can attract activity</li> <li>• Increasing instability within the federal government</li> <li>• Presence of railroad infrastructure traversing city limits</li> <li>• Presence of Valley City State University</li> <li>• Interstate 94</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Presence of full-time city of Valley City Police Department and Barnes County Sheriff’s Office can attract activity</li> <li>• City not located near a major metropolitan population, international airport, stadium, or international tourist attraction</li> <li>• Public safety comm. (Public Safety Answering Points)</li> </ul>
<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Presence of energy pipelines and related infrastructure</li> <li>• Presence of full-time city of Valley City Police Department and Barnes County Sheriff’s Office can attract activity</li> <li>• Increasing instability within the federal government</li> <li>• Presence of railroad infrastructure traversing city limits</li> <li>• Presence of Valley City State University</li> <li>• Interstate 94</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Presence of full-time city of Valley City Police Department and Barnes County Sheriff’s Office can attract activity</li> <li>• City not located near a major metropolitan population, international airport, stadium, or international tourist attraction</li> <li>• Public safety comm. (Public Safety Answering Points)</li> </ul>		

Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment - Continued

Civil Disturbance	
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Presence of energy pipelines and related infrastructure</li> <li>• Presence of full-time city of Valley City Police Department and Barnes County Sheriff’s Office can attract activity</li> <li>• Increasing instability within the federal government</li> <li>• Presence of railroad infrastructure traversing city limits</li> <li>• <b>Social Media</b></li> <li>• Inadequate mental health care and resources in North Dakota</li> <li>• Presence of Valley City State University</li> <li>• Facilities supporting functions key to daily operations of the county and incorporated jurisdictions, such as the Barnes County Courthouse, Barnes County Law Enforcement Center, Valley City City Hall, public schools, or buildings supporting emergency services such as fire and ambulance halls</li> <li>• The CHI-Mercy Hospital and the Barnes County Correctional Center</li> <li>• Infrastructure such as electric power &amp; water/wastewater</li> <li>• Interstate 94</li> <li>• The city of Valley City’s water treatment plant, water towers, and pumping stations lack security measures such as door alarms, door locks, security fencing, motion-detecting systems, security camera surveillance systems</li> </ul>
	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Presence of energy pipelines and related infrastructure</li> <li>• Presence of full-time city of Valley City Police Department and Barnes County Sheriff’s Office can attract activity</li> <li>• City not located near a major metropolitan population, international airport, stadium, or international tourist attraction</li> <li>• Public safety comm. (Public Safety Answering Points)</li> <li>• Increased security measures at public schools, public buildings, and infrastructure</li> </ul>

Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment – Continued

Criminal, Terrorist, Nation-State Attack			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads &amp; Delayed Emergency Response</li> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Disease Outbreak/Mass Infections</li> <li>• <b>Explosion – railroad, tier II site, pipelines</b></li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> <li>• Human Injury/Death</li> </ul> <ul style="list-style-type: none"> <li>• Loss of Communication Systems</li> <li>• Mass Casualties/Fatalities</li> <li>• Property Damage (Structure)</li> <li>• Property Damage (Vehicle)</li> <li>• <b>Shutting down of the city and regional commerce indefinitely if an attack targets bridges, dams, railroads</b></li> <li>• <b>Potential for mass casualties or widespread sickness if water or wastewater infrastructure was targeted</b></li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Miscellaneous property damage occurring in the city on an occasional basis</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Presence of energy pipelines and related infrastructure</li> <li>• Presence of full-time city of Valley City Police Department and Barnes County Sheriff’s Office can attract activity</li> <li>• Increasing instability within the federal government</li> <li>• Presence of railroad infrastructure traversing city limits</li> <li>• Presence of Valley City State University</li> <li>• Facilities supporting functions key to daily operations of the county and incorporated jurisdictions, such as the Barnes County Courthouse, Barnes County Law Enforcement Center, Valley City City Hall, public schools, or buildings supporting emergency services such as fire and ambulance halls</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Presence of full-time city of Valley City Police Department and Barnes County Sheriff’s Office can attract activity</li> <li>• City not located near a major metropolitan population, international airport, stadium, or international tourist attraction</li> <li>• Public safety comm. (Public Safety Answering Points)</li> </ul> </td> </tr> </table>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Presence of energy pipelines and related infrastructure</li> <li>• Presence of full-time city of Valley City Police Department and Barnes County Sheriff’s Office can attract activity</li> <li>• Increasing instability within the federal government</li> <li>• Presence of railroad infrastructure traversing city limits</li> <li>• Presence of Valley City State University</li> <li>• Facilities supporting functions key to daily operations of the county and incorporated jurisdictions, such as the Barnes County Courthouse, Barnes County Law Enforcement Center, Valley City City Hall, public schools, or buildings supporting emergency services such as fire and ambulance halls</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Presence of full-time city of Valley City Police Department and Barnes County Sheriff’s Office can attract activity</li> <li>• City not located near a major metropolitan population, international airport, stadium, or international tourist attraction</li> <li>• Public safety comm. (Public Safety Answering Points)</li> </ul>
<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Presence of energy pipelines and related infrastructure</li> <li>• Presence of full-time city of Valley City Police Department and Barnes County Sheriff’s Office can attract activity</li> <li>• Increasing instability within the federal government</li> <li>• Presence of railroad infrastructure traversing city limits</li> <li>• Presence of Valley City State University</li> <li>• Facilities supporting functions key to daily operations of the county and incorporated jurisdictions, such as the Barnes County Courthouse, Barnes County Law Enforcement Center, Valley City City Hall, public schools, or buildings supporting emergency services such as fire and ambulance halls</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Presence of full-time city of Valley City Police Department and Barnes County Sheriff’s Office can attract activity</li> <li>• City not located near a major metropolitan population, international airport, stadium, or international tourist attraction</li> <li>• Public safety comm. (Public Safety Answering Points)</li> </ul>		



Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment – Continued

Criminal, Terrorist, Nation-State Attack			
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Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment – Continued

Cyberattack	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (private &amp; public)</li> <li>• HAZMAT Release</li> <li>• Human Injury/Death</li> <li>• Loss of Communication Systems</li> <li>• School Closure</li> </ul> <ul style="list-style-type: none"> <li>• <b>Targeting of emergency services personnel</b> <b>Loss of websites and information for critical facilities such as city government, hospitals or universities</b></li> <li>• <b>Shutting down of infrastructure systems resulting in loss of economy activity as technological systems are used in nearly all industries, both public and private</b></li> <li>• <b>Loss of public confidence in city government</b></li> <li>• <b>Loss of sewer and water systems managed by SCADA</b></li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• According to Valley City Public Schools, email accounts of staff have been comprised in the past.</li> <li>• According to Valley City State University, email accounts have been compromised that send out SPAM or phishing accounts</li> </ul> <ul style="list-style-type: none"> <li>• In 2020 a breach of Blackbaud, a private company, impacted the VCSU alumni system, along with Minot State and NDSU. Personal information of alumni may have been exposed.</li> </ul>
<b>Likelihood</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Digital economy with nation-wide banks and other institutions electronically linked to the city</li> <li>• Social media</li> <li>• Technological systems used in nearly all industries</li> <li>• Valley City Public School District</li> <li>• CHI-Mercy Hospital</li> <li>• Barnes County Courthouse &amp; Law Enforcement Center</li> </ul> </div> <div style="width: 48%;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• IT staff and infrastructure in place at Valley City Public School District and local government offices to protect against attacks</li> <li>• Increased investment in security measures in private and public sectors (i.e., firewalls)</li> <li>• Ongoing investment in preventative education and enhanced countermeasures</li> <li>• NDIR and NDSLIC</li> <li>• Redundancies in city technology and power systems</li> </ul> </div> </div>
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Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment - Continued

	Dam Failure	
<b>Impact</b>	<ul style="list-style-type: none"> <li>Blocked Roads &amp; Delayed Emergency Response</li> <li>Evacuation (Localized)</li> <li>Loss of Critical Facilities and Infrastructure, &amp; Power</li> <li><b>Mass Casualties/Fatalities due to small warning time</b></li> <li>Loss of recreational activities and summertime population resulting in economic loss</li> <li>Regional and national bridges and roads in and around inundation areas</li> <li>Possibly temporary homeless population due to lack of facilities to shelter large numbers of people</li> </ul>	<ul style="list-style-type: none"> <li>Destruction of potable water infrastructure</li> <li>Statewide interruption of transportation mobility due to impact to Interstate 94</li> <li>Loss of wildlife habitat</li> <li><b>Impact can range from minor flooding to catastrophic destruction of the urbanized core of Valley City resulting in mass casualties/fatalities and untold losses to the economy and buildings and infrastructure</b></li> <li><b>Loss of an estimate 3,000 housing units in Valley City</b></li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>No occurrences of dam failure</li> </ul>	
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Heavy rains and/or melting of snow pack may lead to dams becoming overwhelmed</li> <li>Aging infrastructure – at 50 years the likely/probability of a dam failure increases</li> <li><b>Climate change will affect the likelihood of dam failures due to significant changes and fluctuations in precipitation frequency and volume</b></li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>Annual and ongoing dam inspections and routine maintenance</li> <li>Permanent trained subject matter experts providing continuous monitoring and maintenance of dams</li> <li>Baldhill Dam does not have power generation capabilities – less likely a target to homeland security threats</li> <li>Embankment/earthen dams are hard to damage and able to withstand terrorist attacks better than cement structure</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Small window of warning if a failure occurred</li> <li>BNSF, CP Railway, and Interstate 94 – disruption in state and regional transportation mobility</li> <li>Lack of facilities to shelter potentially large temporary homeless population</li> <li>All of Valley City emergency response and government facilities are in the inundation area</li> <li><b>Barnes County Courthouse, CHI-Mercy Hospital, and Valley City City Hall located in inundation area</b></li> <li>Possible” terrorist” action could target the dams</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>Individual Emergency Action Plans (EAPs)</li> <li>Barnes County mass notification capabilities</li> <li><b>Baldhill Dam Operations Meeting (annually in April) directed by Bureau of Reclamation and USACE</b></li> <li>Embankment/earthen dams are hard to damage and able to withstand terrorist attack better than cement structures</li> <li>Baldhill Dam does not have power generation capabilities – less likely a target to homeland security threats</li> <li>Routine daily, monthly, annual, and periodic examinations of Baldhill Dam, depending on water elevation</li> </ul>

Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment - Continued

Drought			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Diminished local food supply</li> <li>• Higher cost to cool homes, increased utilities</li> <li>• Increase in Wildland Fire Potential</li> <li>• <b>Loss of Economy</b></li> <li>• Shortages of water may occur resulting in stress on irrigation systems and dry vegetation, which produces less feed for livestock Water quality compromised from stock dams</li> <li>• Diminished soil health</li> <li>• Negative impact on mental health of producers and fire responders – “community impact”</li> <li>• Local producers forced to sell off herds which can last for several years</li> <li>• Population loss as people moved away due to loss of economy</li> <li>• <b>Higher rates of suicide and domestic issues from people stressed from monetary losses from crop damage</b></li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Severe Drought of 1961/1962, <b>1988/1989</b> through 1991/1992, 2012/2013</li> <li>• Summer of 2017, local producers forced to sell off portions of their herds</li> <li>• End of July through winter of 2016 – county reached severe drought status</li> <li>• <b>Severe drought winter 2020/2021 and summer 2021</b></li> <li>• <b>FSA activated the Livestock Forage Program in 2012 in Barnes County</b></li> <li>• <b>Based on 13 state declared emergency orders, one was presidential, and 13 were U.S.D.A. Secretarial Declarations pertaining to drought between 1976 and 2017, the probability of drought is 67 percent in any given year.</b></li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Dry/wet cycle every 10 years</li> <li>• Climatic patterns will result in an eventual drought of significance</li> <li>• Lack of precipitation</li> <li>• Weather patterns becoming more irregular and extreme</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Heavy precipitation</li> <li>• Drain tile will drain excess soil moisture/water but not contribute to severe drought conditions because it only drains to field capacity</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Dry/wet cycle every 10 years</li> <li>• Climatic patterns will result in an eventual drought of significance</li> <li>• Lack of precipitation</li> <li>• Weather patterns becoming more irregular and extreme</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Heavy precipitation</li> <li>• Drain tile will drain excess soil moisture/water but not contribute to severe drought conditions because it only drains to field capacity</li> </ul>
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Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment - Continued

Fire – Urban Fire/Structure Collapse			
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<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Annual occurrences of structures/vehicles being impacted</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Close spacing of downtown structures/age of structures</li> <li>• Increased use of electric heaters</li> <li>• Presence of outdated electric wiring &amp; heating systems</li> <li>• <b>Inoperable fire hydrants in private developments and inadequate water pressure</b></li> <li>• <b>Private developments/entities controlling public goods like fire suppression</b></li> <li>• <b>Lengthy response time to portions of the city</b></li> <li>• <b>Growing population</b></li> <li>• <b>Presence of abandoned buildings</b></li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Building codes</li> <li>• Better building standards and maintenance of structures</li> <li>• City mows and maintains vegetation in public parks and city lots</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> </ul> </td> </tr> </table>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Close spacing of downtown structures/age of structures</li> <li>• Increased use of electric heaters</li> <li>• Presence of outdated electric wiring &amp; heating systems</li> <li>• <b>Inoperable fire hydrants in private developments and inadequate water pressure</b></li> <li>• <b>Private developments/entities controlling public goods like fire suppression</b></li> <li>• <b>Lengthy response time to portions of the city</b></li> <li>• <b>Growing population</b></li> <li>• <b>Presence of abandoned buildings</b></li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Building codes</li> <li>• Better building standards and maintenance of structures</li> <li>• City mows and maintains vegetation in public parks and city lots</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> </ul>
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Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment – Continued

Fire – Rural & Wildland	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Crop Loss</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• Increase Fire Potential</li> <li>• <b>Loss of farm equipment and agriculture infrastructure</b></li> <li>• Loss of Livestock</li> <li>• Loss of Power/Downed Power Lines</li> <li>• <b>Loss of Wildlife Habitat</b></li> <li>• <b>Mass Casualties /Fatalities</b></li> <li>• <b>Property Damage (Structure &amp; Vehicle)</b></li> <li>• <b>Increase in asthma from fire smoke</b></li> </ul> <ul style="list-style-type: none"> <li>• <b>Losses could be on a significant scale if impacting a major producer or farmstead near city limits or critical infrastructure</b></li> <li>• <b>Economic impact to the railroad as shipping can be shut down</b></li> <li>• <b>Shutting down of Interstate 94 and other state highways and county roads from reduced visibility, which can limit accessibility for emergency services and result in transportation incidents</b></li> <li>• <b>Financial drain and reduced productivity in local government performing normal city services as they become overwhelmed during a wildland fire</b></li> <li>• <b>Reduced visibility from fire smoke</b></li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Farmers conduct a large amount of controlled burning annually</li> <li>• Approximately 20 percent of burning become uncontrolled</li> <li>• Approximately 90 percent fires occur in spring and fall</li> <li>•</li> </ul> <ul style="list-style-type: none"> <li>• Wildland fires typically are started from human-induced fire of equipment and rural structures</li> <li>• Reports of lightning starting fires has occurred in the past</li> </ul>
<b>Likelihood</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> <li>• Presence of railroad infrastructure traversing city limits ignite fires form sparks</li> <li>• Changing climates and weather patterns</li> <li>• Growing rural residential population increasing Wildland-Urban Interface</li> <li>• Fireworks during the 4<sup>th</sup> of July holiday</li> </ul> </div> <div style="width: 45%;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> </ul> </div> </div>

Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment – Continued

Fire – Rural & Wildland			
<b>Vulnerability</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Presence of railroad infrastructure traversing city limits</li> <li>• Lack of fire breaks around city limits and critical facilities and infrastructure</li> <li>• Changing climates and weather patterns</li> <li>• Growing rural residential population increasing Wildland-Urban Interface</li> <li>• Fireworks during the 4<sup>th</sup> of July holiday</li> <li>• Rural structures and farm equipment increase likelihood of spread to wildland fire</li> <li>• Presence of sloughs reduces mobility of fire department/district vehicles and limits accessibility</li> <li>• Potentially prolonged response time from VCFD due to geographic size of coverage area</li> <li>• Potentially prolonged response time from neighboring rural fire departments due to size of coverage area</li> <li>• Large elderly population in surrounding rural areas</li> <li>• Road closures during flooding events limits accessibility for emergency services to respond to wildland fires</li> <li>• <b>Lack of GPS/GIS equipment in VCFD trucks</b></li> <li>• Lack of volunteer recruitment</li> <li>• Poor vegetation management by railroad along railroad infrastructure</li> <li>• High slope areas with thick vegetation hard to manage due to lack of roads or ways of mobility up the hill sides</li> <li>• <b>Valley City Fire Hall needs an upgraded permanent generator</b></li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Fire department and district is well trained and educated on property fire suppression techniques</li> <li>• Fire department and district has trucks and equipment to move water for fire suppression</li> <li>• High water table and moisture in the soil</li> <li>• Barnes County Ambulance headquartered in the city</li> <li>• MOUs with neighboring fire departments</li> <li>• <b>Dispatch-activated emergency sirens</b></li> <li>• Summer and winter weather with heavy precipitation</li> <li>• <b>Barnes County Burn Bans</b></li> </ul> </td> </tr> </table>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Presence of railroad infrastructure traversing city limits</li> <li>• Lack of fire breaks around city limits and critical facilities and infrastructure</li> <li>• Changing climates and weather patterns</li> <li>• Growing rural residential population increasing Wildland-Urban Interface</li> <li>• Fireworks during the 4<sup>th</sup> of July holiday</li> <li>• Rural structures and farm equipment increase likelihood of spread to wildland fire</li> <li>• Presence of sloughs reduces mobility of fire department/district vehicles and limits accessibility</li> <li>• Potentially prolonged response time from VCFD due to geographic size of coverage area</li> <li>• Potentially prolonged response time from neighboring rural fire departments due to size of coverage area</li> <li>• Large elderly population in surrounding rural areas</li> <li>• Road closures during flooding events limits accessibility for emergency services to respond to wildland fires</li> <li>• <b>Lack of GPS/GIS equipment in VCFD trucks</b></li> <li>• Lack of volunteer recruitment</li> <li>• Poor vegetation management by railroad along railroad infrastructure</li> <li>• High slope areas with thick vegetation hard to manage due to lack of roads or ways of mobility up the hill sides</li> <li>• <b>Valley City Fire Hall needs an upgraded permanent generator</b></li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Fire department and district is well trained and educated on property fire suppression techniques</li> <li>• Fire department and district has trucks and equipment to move water for fire suppression</li> <li>• High water table and moisture in the soil</li> <li>• Barnes County Ambulance headquartered in the city</li> <li>• MOUs with neighboring fire departments</li> <li>• <b>Dispatch-activated emergency sirens</b></li> <li>• Summer and winter weather with heavy precipitation</li> <li>• <b>Barnes County Burn Bans</b></li> </ul>
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Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment – Continued

		Flood
Impact	<p><b>Blocked Roads:</b></p> <ul style="list-style-type: none"> <li>• Viking Circle neighborhood</li> <li>• 9<sup>th</sup> St. SW and 10<sup>th</sup> St. SW from 11<sup>th</sup> Ave SW to 15<sup>th</sup> Ave SW</li> <li>• 4<sup>th</sup> Ave NW near 10<sup>th</sup> St. NW / Secarse Drive</li> <li>• 3<sup>rd</sup> Ave NW and 4<sup>th</sup> St. NW</li> <li>• 8<sup>th</sup> Ave SW to Sheyenne River</li> <li>• 6<sup>th</sup> Ave SE and Valley Ave SE</li> <li>• Main Street from 5<sup>th</sup> Ave W west to city limit boundary</li> </ul> <ul style="list-style-type: none"> <li>• Delayed Emergency Response</li> <li>• Flooding (Highway &amp; Structure)</li> <li>• Human Injury/Death</li> <li>• Property Damage to basements from ground seepage</li> <li>• Flood waters inundate the city’s sanitary sewer system from ground seepage draining into floor drains in people’s basements</li> <li>• Basements have become flooded</li> <li>• Residents have sump pumps running 24/7 in some areas</li> </ul>	<ul style="list-style-type: none"> <li>• Large loss of property, vehicles, personal property</li> <li>• Some casualties are possible</li> <li>• Residents may miss work from flooding of basements or damage to personal property resulting in loss of economy</li> <li>• Loss of access in and out of the city due to flooding of roadways</li> <li>• Limited access for emergency services</li> <li>• Mental health issues in general population from trauma experienced through property and personal loss due to flooding</li> <li>• Contamination of water wells serving as source of drinking water for the city. May result in disease outbreaks.</li> <li>• Spoiling of food due to loss of electricity may result in disease</li> <li>• <b>Sewer and water systems are out of commission and can contribute to property damage and transmission of disease</b></li> <li>• <b>Loss of power resulting in reduced economic activity</b></li> <li>• <b>Financial drain and reduced productivity in local government performing normal city services as they become overwhelmed during flood events</b></li> </ul>
Frequency	<ul style="list-style-type: none"> <li>• Depends largely on weather patterns</li> <li>• Annual occurrences of localized flooding of nearby township roads and highways</li> <li>• Overland flooding from high water tables impacting city streets every five years</li> <li>• <b>Every event of heavy precipitation or quick snow melt, the roads listed under impacts experience overland flooding</b></li> </ul>	<ul style="list-style-type: none"> <li>• Large snow melt in spring of 2009, 2010 and 2011 resulting in riverine and overland flooding of city streets</li> <li>• <b>Presidential Disaster Declarations in 2019 and 2020</b></li> </ul>

Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment – Continued

Flood	
<b>Likelihood</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• Areas of poor drainage in city limits</li> <li>• Low spots on city streets</li> <li>• Underpasses</li> <li>• Heavy precipitation from summer weather (downpours)</li> <li>• Saturated soil conditions</li> </ul> </div> <div style="width: 48%;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Dry seasons and low precipitation</li> <li>• Baldhill Dam</li> <li>• <b>Valley City Permanent Flood Protection Project – construction ongoing early 2030s</b></li> </ul> </div> </div>
<b>Vulnerability</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Low spots on city streets/areas of poor drainage in city limits</li> <li>• Core of the city located in a low area of elevation based on the overall topography of the city</li> <li>• <b>Topography does not allow swift drainage of precipitation, snow melt, standing water</b></li> <li>• <b>Lack of new flood control measures</b></li> <li>• <b>High water table</b></li> <li>• <b>Large amount of tree and vegetative debris are snagging in the Sheyenne River channel caused by loss of root/bank integrity resulting in failure of trees</b></li> <li>• <b>Vegetation catching on bridges slowing the flow of water</b></li> <li>• <b>Presence of clay tile, concrete, PVC, and brick storm water system which allows ground water to infiltrate the system.</b></li> <li>• <b>Lack of generators for drinking/potable water system</b></li> <li>• <b>High water table near Barnes County Highway Department Headquarters</b></li> <li>• <b>Low-lying areas near bridge over Sheyenne River with potential impact to city infrastructure</b></li> <li>• <b>Citywide inflow and infiltration issues with the sanitary sewer system</b></li> <li>• <b>6<sup>th</sup> Ave NW washes out since Meadow Hills was opened</b></li> <li>• <b>Rural drainage near 10<sup>th</sup> Ave NW and 3<sup>rd</sup> St. NW</b></li> <li>• <b>City electrical infrastructure located in low-lying areas</b></li> </ul> </div> <div style="width: 48%;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• City has flood ordinances and is enrolled in the NFIP</li> <li>• <b>Backup generator at Master Lift Station</b></li> <li>• No drain tile may increase amount of standing water</li> <li>• Storm water system reduces amount of standing water</li> <li>• City-County Health District works with care centers and public schools to educate staff on proper sanitation during flood events</li> <li>• Installation of new culverts throughout the city decreases amount of standing water</li> <li>• Extensive manpower provided by the fire department, street department/public works</li> <li>• <b>Valley City Permanent Flood Protection Project – construction ongoing early 2030s</b></li> </ul> </div> </div>

Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment – Continued

	Geologic Hazard	
<b>Impact</b>	<ul style="list-style-type: none"> <li>Blocked Roads &amp; Delayed Emergency Response</li> <li>Business &amp; Government Interruptions</li> <li>Infrastructure Degradation</li> <li>Loss of Power/Electricity Outage</li> </ul>	<ul style="list-style-type: none"> <li>Soil Degradation/Erosion <b>Short-term or prolonged loss of service of transportation, communication, or energy infrastructure.</b></li> <li><b>Structures could become uninhabitable or unusable</b></li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>No incidents involving Abandoned Mine Lands in city limits</li> </ul>	<ul style="list-style-type: none"> <li>September 15, 2021 - ridge on the north side of Malach USA and John Deere Seeding Group extending from Interstate 94 Exit 294 and extends to 12<sup>th</sup> Avenue NE that has been impacted by landslides</li> </ul>
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>High water tables and subsequent ground saturation may contribute to land subsidence or slumping in hilly areas near the Sheyenne River Valley</li> <li>City of Valley City located in EPA Radon Zone 1</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>No Abandoned Mine Lands located near city limits</li> <li>PSC has an AML reclamation project aimed at recovering AMLs – work has been done in other parts of the state</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>City of Valley City located in EPA Radon Zone</li> <li><b>Landslide areas near 14<sup>th</sup> St SW impacting water, sewer, and roadway infrastructure</b></li> <li><b>Landslides on Main St. East between I-94 Exit 294 and 15<sup>th</sup> Ave NE</b></li> <li><b>Landslides near 12<sup>th</sup> Ave SE near John Deere Seeding</b></li> <li><b>Landslides on Main St. West near County Highway 19 and south and west of junction of I-94 and County Highway 19</b></li> <li><b>Hillsides on the southside of VCSU</b></li> <li>East of city limits adjacent to CP Railway near country club</li> <li>On 9<sup>th</sup> Ave NW north of Pioneer Park to 12<sup>th</sup> St. NW</li> <li>Single-family homes in the Crestwood Subdivision</li> <li>Malach Main Manufacturing Plant</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>No Abandoned Mine Lands located near city limits</li> <li>PSC has an AML reclamation project aimed at recovering AMLs – work has been done in other parts of the state</li> </ul>

Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment – Continued

		Hazardous Material Release	
Impact	<ul style="list-style-type: none"> <li>Blocked Roads &amp; Delayed Emergency Response</li> <li>Environmental Degradation</li> <li>Evacuation (localized)</li> <li>Explosion – Spiritwood Energy Park or pipeline</li> <li>Loss of life, crops and livestock</li> <li>Loss of economy</li> <li>Human Injury/Death</li> <li>Increased Fire Potential</li> <li>Loss of Power and Potable Water</li> <li>Property Damage</li> <li>Potential for short and long-term injuries</li> <li>Potential for fire as a secondary impact</li> <li>Blocked roads could result in temporary isolation and shortage or outage of critical materials or infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>Could result in explosion and destruction of buildings in Downtown Valley City from trains carrying hazardous chemicals and oil shipments</li> <li>Mass casualties if a release were to occur on Interstate 94 or anywhere in the city limits</li> <li>Potable water sources could be contaminated if a release were to impact the Sheyenne River</li> <li><b>Potential for contamination of soil and infrastructure and public/private critical facilities</b></li> <li><b>Potential for damage to Valley City Fire Department headquarters due to location proximate to railroad and storage of fuels at nearby businesses</b></li> <li><b>Financial drain and reduced productivity in local government performing normal city services as they become overwhelmed during a release</b></li> </ul>	
Frequency	<ul style="list-style-type: none"> <li>Small incidents of leaking anhydrous tank once annually</li> <li>Occurrences of leaks from railroad traffic through the center of city reported bi-annually</li> </ul>	<ul style="list-style-type: none"> <li><b>Release of gasoline at the truck stop in the southeast quadrant of the Interstate 94 U.S. Highway 281 interchange in 2015</b></li> </ul>	
Likelihood	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Transportation of chemicals by truck through city limits</li> <li>Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li><b>Railroad infrastructure traversing city limits</b></li> <li>Presence of Interstate 94 and numerous N.D. Highways</li> <li><b>DAPL pipeline court ruling could increase rail traffic</b></li> <li><b>Presence of pipelines</b></li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>Private companies have HAZMAT certifications</li> <li>Pipelines have digital technology for detection of leaks</li> <li>Natural gas availability as heating source decreases propane and alternative fuel sources</li> <li>Railroad oil traffic decreased by 75 percent once the Dakota Access Pipeline opened</li> <li>Railroad trains have reduced speed when traversing through the city</li> </ul>	

Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment – Continued

Hazardous Material Release	
<b>Likelihood</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• <b>Barnes County Municipal Airport</b></li> <li>• Fuel oil and anhydrous stored in tanks in city limits</li> <li>• <b>City located on Interstate 94 and U.S. Highways 52/281 which carry large amounts of truck traffic hauling chemicals/hazardous materials</b></li> <li>• <b>Increased industrial development at Spiritwood</b></li> <li>• Natural gas availability as heating source</li> </ul> </div> <div style="width: 48%;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> <li>• Pipelines have digital technology for detection of leaks</li> <li>• Natural gas availability as heating source decreases propane and alternative fuel sources</li> <li>• Railroad oil traffic decreased by 75 percent once the Dakota Access Pipeline opened</li> <li>• Railroad trains have reduced speed when traversing through the city</li> </ul> </div> </div>
<b>Vulnerability</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• <b>Critical facilities and infrastructure located in proximity to railroad and major transportation routes</b></li> <li>• Transportation of chemicals by truck through city limits – city lacks official truck route</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• <b>Railroad infrastructure traversing city limits</b></li> <li>• <b>City located on Interstate 94</b></li> <li>• <b>Presence of pipelines</b></li> <li>• <b>Presence of only one grade-separated crossing in city with the railroad</b></li> <li>• Presence of side-track allows parking of freight trains with hazardous material temporarily stored in city limits</li> <li>• <b>Hazardous materials transported via the Hi-Line Bridge above the Sheyenne River Valley in Valley City</b></li> <li>• <b>Residential areas near BNSF and Barnes County Municipal Airport</b></li> <li>• <b>CP Railway near intersection with BNSF Hi-Line Bridge</b></li> <li>• <b>Hospital lacks adequate decontamination equipment</b></li> </ul> </div> <div style="width: 48%;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Cell phone service in the area is reliable</li> <li>• <b>City water treatment plant located away from railroad and major transportation routes</b></li> <li>• Fire departments have frequent HAZMAT training</li> <li>• <b>Barnes County Ambulance</b></li> <li>• <b>Valley City Fire Dept. and HAZMAT Team</b></li> <li>• <b>CHI-Mercy Hospital and clinics</b></li> <li>• Medical supplies in stock at City-County Health District and CHI-Mercy Hospital</li> <li>• Natural gas availability as heating source decreases propane and alternative fuel sources</li> <li>• <b>Dispatch-activated emergency sirens</b></li> <li>• <b>Barnes County has a HAZMAT Flow Study</b></li> <li>• Trains have reduced speed when traversing through the city</li> </ul> </div> </div>

Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment – Continued

Infectious Disease	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop &amp; Loss of livestock</li> <li>• Financial Hardship/Strain (public health and city)</li> <li>• Human Injury/Death or Mass Casualties/Fatalities</li> <li>• Loss of Economy</li> <li>• Loss of medical staff due to sickness</li> <li>• Loss/Overcrowding of Medical Facilities &amp; Mortuary Services</li> <li>• Loss of Potable Water</li> <li>• Disruptions in essential services and critical infrastructure operations if specific people in the community become sick due to lack of alternative staff to fill in</li> </ul> <ul style="list-style-type: none"> <li>• <b>Financial drain and reduced productivity in local government performing normal city services as they become overwhelmed during a pandemic</b></li> <li>• <b>Infrastructure degradation resulting from labor shortages</b></li> <li>• <b>Labor shortages in medical facilities</b></li> <li>• <b>Loss confidence in local government</b></li> <li>• <b>School Closure</b></li> <li>• <b>Strain on local medical resources (ambulance)</b></li> <li>• <b>Supply chain shortages</b></li> <li>• <b>Impact is highly dependent on the type of disease/virus and its effect on the population, and which population and availability of Personal Protection Equipment (PPE)</b></li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Annual occurrences of death, primarily among the elderly</li> <li>• Occurrence of disease - 1 in 3 for people annually</li> <li>• Annual occurrences of influenza cases among the public</li> <li>• Limiting of visitation at CHI-Mercy Hospital and long-term care facilities due to concerns with spreading of influenza in January 2015</li> </ul> <ul style="list-style-type: none"> <li>• H1N1 outbreak in 2009</li> <li>• <b>The COVID-19 pandemic of from 2019 to 2021 resulted in mass quarantine and sheltering of the local population and temporary closure of businesses. Numerous city residents died from the disease. Limited visitation at CHI-Mercy Hospital and long-term care facilities</b></li> </ul>
<b>Likelihood</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• Growing elderly population</li> <li>• Small population of children without immunization as parents elect to not vaccinate children</li> <li>• Dependent on weather for animals and crops</li> <li>• Transporting of animals across state lines</li> <li>• Increase in transient workforce</li> <li>• Clustering of populations at Valley City State University – some from overseas that may contribute to infections during a global pandemic</li> <li>• Lack of dedicated staff for grant writing purposes</li> </ul> </div> <div style="width: 48%;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• <b>Adequate storage space and refrigeration units for local stockpile of medical supplies at CCHD</b></li> <li>• Advanced communications such as internet and tv</li> <li>• City mows public parks and open spaces to regulate vegetation</li> <li>• Public health and employment regulations for public facilities</li> <li>• Installation of new flood control measures reduces amount of standing water and flood damage to homes</li> <li>• CHI-Mercy Hospital and medical clinics in the city are well-prepared to handle general needs of local population</li> <li>• Residents mow lawns and keeps vegetation under control</li> </ul> </div> </div>

Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment – Continued

Infectious Disease			
Vulnerability	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Abandoned buildings in city limits contributes to vector control problems that may spread disease</li> <li>• Agriculture economy</li> <li>• Growing elderly population</li> <li>• Large school-aged population and daycares</li> <li>• Small population of children without immunization as parents elect to not vaccinate children</li> <li>• Transporting of animals across state lines</li> <li>• <b>People pumping water from basements from ground seepage into city streets during flooding events</b></li> <li>• <b>Misinformation on social media - lack of public awareness</b></li> <li>• <b>CCHD and CHI-Mercy Hospital becoming overwhelmed and experience supply shortages and staffing issues</b></li> <li>• Presence of populations living in trailer homes, subsidized housing, senior housing, and student-populations, which may lack transportation options to access medical care</li> <li>• <b>Presence of institutionalized populations at Barnes County Correctional Center, CHI-Mercy Hospital, and VCSU</b></li> <li>• Shrinking availability of funds for emergency preparedness and response planning which limits ability of CCHD and CHI-Mercy Hospital to educate staff and public</li> <li>• <b>Undersized permanent generator at CCHD facility used for mass testing and vaccination activity</b></li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• <b>Adequate storage space and refrigeration units for local stockpile of medical supplies at CCHD which has a central location in downtown Valley City</b></li> <li>• Advanced communications such as internet and tv</li> <li>• City mows public parks and open spaces to regulate growth and extent of vegetation</li> <li>• Public health and employment regulations for public facilities Immunizations &amp; medications of local population</li> <li>• Installation of new flood control measures reduces amount of standing water and flood damage to homes</li> <li>• CHI-Mercy Hospital and medical clinics in the city are well-prepared to handle general needs of local population but have limited supplies for large outbreaks</li> <li>• Residents mow lawns and keeps vegetation under control</li> <li>• <b>CCHD has vaccine relocation plan if threatened due to loss of power or other issues</b></li> <li>• Well-trained and educated EMT and ambulance staff</li> <li>• Community Health Partnership meets frequently consisting of health and safety officials</li> <li>• <b>CHI-Mercy Hospital has backup generators to power the facility in its entirety from loss of power</b></li> <li>• <b>Backup generator at city’s Main Lift Station</b></li> <li>• CCHD has access to the state Mobile Medical Unit</li> <li>• State stages a Medical Shelter Trailer in Valley City with ample medical supplies and serves as a regional asset</li> <li>• Joint Powers Agreements between CCHD and eight counties and seven health departments</li> </ul> </td> </tr> </table>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Abandoned buildings in city limits contributes to vector control problems that may spread disease</li> <li>• Agriculture economy</li> <li>• Growing elderly population</li> <li>• Large school-aged population and daycares</li> <li>• Small population of children without immunization as parents elect to not vaccinate children</li> <li>• Transporting of animals across state lines</li> <li>• <b>People pumping water from basements from ground seepage into city streets during flooding events</b></li> <li>• <b>Misinformation on social media - lack of public awareness</b></li> <li>• <b>CCHD and CHI-Mercy Hospital becoming overwhelmed and experience supply shortages and staffing issues</b></li> <li>• Presence of populations living in trailer homes, subsidized housing, senior housing, and student-populations, which may lack transportation options to access medical care</li> <li>• <b>Presence of institutionalized populations at Barnes County Correctional Center, CHI-Mercy Hospital, and VCSU</b></li> <li>• Shrinking availability of funds for emergency preparedness and response planning which limits ability of CCHD and CHI-Mercy Hospital to educate staff and public</li> <li>• <b>Undersized permanent generator at CCHD facility used for mass testing and vaccination activity</b></li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• <b>Adequate storage space and refrigeration units for local stockpile of medical supplies at CCHD which has a central location in downtown Valley City</b></li> <li>• Advanced communications such as internet and tv</li> <li>• City mows public parks and open spaces to regulate growth and extent of vegetation</li> <li>• Public health and employment regulations for public facilities Immunizations &amp; 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Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment – Continued

Severe Summer Weather	
<b>Impact</b>	<p><b>Blocked Roads:</b></p> <ul style="list-style-type: none"> <li>• Viking Circle neighborhood</li> <li>• 9<sup>th</sup> St. SW and 10<sup>th</sup> St. SW from 11<sup>th</sup> Ave SW to 15<sup>th</sup> Ave SW</li> <li>• 4<sup>th</sup> Ave NW near 10<sup>th</sup> St. NW / Secarse Drive</li> <li>• 3<sup>rd</sup> Ave NW and 4<sup>th</sup> St. NW</li> <li>• 8<sup>th</sup> Ave SW to Sheyenne River</li> <li>• 6<sup>th</sup> Ave SE and Valley Ave SE</li> <li>• Main Street from 5<sup>th</sup> Ave W west to city limit boundary</li> </ul> <ul style="list-style-type: none"> <li>• Most city streets would be blocked if a 100-year flood event occurred.</li> <li>• Damage to electrical equipment from lightning</li> <li>• Downed Trees</li> <li>• Evacuation (Localized)</li> <li>• Government Interruptions</li> </ul> <ul style="list-style-type: none"> <li>• Human Injury/Death – heat exhaustion</li> <li>• Livestock Injury/Death</li> <li>• Loss of Critical Facilities and Infrastructure Loss of Power/Downed Power Lines</li> <li>• <b>Property Damage – repair of roofing, siding and drainage systems for homes, and vehicles</b></li> <li>• Shelter-in-place</li> <li>• Wash-outs of city streets</li> <li>• Scouring of city bridges</li> <li>• <b>Financial drain and reduced productivity in local government performing normal city services as they become overwhelmed during severe summer weather</b></li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Heavy precipitation resulting in flash flooding annually</li> <li>• Two or three significant storms producing damage to trees and property annually</li> <li>• Windstorm events occurring annually</li> <li>• Heavy rain events occur every other year and results in overland flooding as city is in a closed basin topography</li> <li>• <b>Flood waters from high water tables inundates the city’s sanitary sewer system bi-annually and impacts the basements of people’s homes annually</b></li> </ul> <ul style="list-style-type: none"> <li>• <b>Straight-line wind in September 2012 resulting in major damage</b></li> <li>• Large hailstorm in 2013 resulting in many homes re-shingled</li> <li>• Property damage from tornados/straight-line winds in summer 2017 and 2019</li> </ul>
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Annual hailstorm events</li> <li>• Annual high wind events</li> <li>• Annual occurrences of power loss from storms</li> <li>• Heavy precipitation</li> <li>• Tornado warnings issued once or twice a year</li> <li>• Sheyenne River Valley acts as a funnel and channels wind into the city</li> </ul> <ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard like several severe storm events</li> <li>• Two or three significant storms producing damage to trees and property annually</li> </ul>



Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment – Continued

Severe Summer Weather	
Vulnerability	<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Blocked roads decreases access for emergency services</li> <li>• <b>City is location of substantial critical facilities and infrastructure (MRES and WAPA transmission lines, Barnes County Courthouse, Barnes County Law Enforcement Center, CHI-Mercy Hospital, etc.)</b></li> <li>• City sanitary sewer system is inundated by flood waters resulting from heavy precipitation and inadequate</li> <li>• Downtown buildings with flat roofs are vulnerable</li> <li>• Growing elderly population</li> <li>• Lack of education to the public on power conductivity of trees and power lines</li> <li>• <b>Lack of generators for drinking/potable water system</b></li> <li>• <b>Lack of permanent backup generator at VCSU</b></li> <li>• <b>Lack of portable backup generators for city public works and emergency services</b></li> <li>• <b>Undersized permanent generator at CCHD – facility used for mass sheltering, testing, vaccination activity</b></li> <li>• Presence of mobile homes and lack of shelters</li> <li>• Prolonged response times and limited access for emergency services from blocked roads resulting from debris and water</li> <li>• Railroad infrastructure traversing city limits</li> <li>• Barnes County and the city of Valley City lack a debris management plan</li> <li>• City has one official storm shelter</li> <li>• <b>Presence of undersized and cast-iron water mains</b></li> <li>• <b>Low-lying areas near bridge over Sheyenne River with potential impact to city infrastructure</b></li> <li>• <b>Citywide inflow and infiltration issues with the sanitary sewer system</b></li> <li>• <b>City electrical infrastructure located in low-lying areas and inundated by trees and vegetation</b></li> </ul> </div> <div style="width: 48%;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV – all landline phones are signed up for Barnes Alerts</li> <li>• Building codes and enforcement</li> <li>• Installation of new flood control measures reduces amount of standing water and flood damage to homes</li> <li>• City maintains an inert landfill</li> <li>• City residents have equipment and volunteer time and resources for response and recovery</li> <li>• City streets are on a continuing schedule for maintenance and repair</li> <li>• Dispatch-activated emergency sirens</li> <li>• Extensive manpower and volunteers on Valley City Fire Department and Valley City Rural Fire Protection District</li> <li>• Fire Departments have equipment for moving of water and debris</li> <li>• Well-trained and educated EMT and ambulance staff</li> <li>• <b>Permanent backup generator at CHI-Mercy Hospital to power the facility in its entirety from loss of power</b></li> <li>• <b>Permanent backup generator at city’s Main Lift Station to maintain continuous power and mitigate sewer backups and property damage</b></li> </ul> </div> </div>

Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment – Continued

Severe Winter Weather	
<b>Impact</b>	<p><b>Blocked Roads:</b></p> <ul style="list-style-type: none"> <li>• 3<sup>rd</sup> Ave NW and 12<sup>th</sup> St. NW</li> <li>• Intersection of 12<sup>th</sup> St. NW and 9<sup>th</sup> Ave NW near railroad underpass</li> <li>• Most city streets would be blocked by snow drifts when a major blizzard occurs.</li> </ul> <ul style="list-style-type: none"> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – wind chill</li> <li>• Increase in utility costs to local customers</li> <li>• Increased cost to public works for snow removal</li> <li>• Isolation of the community from blocked roads</li> </ul> <ul style="list-style-type: none"> <li>• Loss of Crops</li> <li>• Loss of Livestock</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> <li>• Shelter-in-place</li> <li>• Vehicle Damage</li> <li>• <b>Financial drain and reduced productivity in local government performing normal city services as they become overwhelmed during severe winter weather</b></li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Annual occurrences of blocked roads</li> <li>• Annual occurrences of power loss from storms</li> <li>• Annual occurrences of wind events</li> <li>• Two or three significant blizzards producing damage to trees and property annually</li> </ul> <ul style="list-style-type: none"> <li>• 1997 Ice Storm resulting in isolation of the city for a week</li> <li>• Major blizzard in fall of 2015</li> <li>• 2016 Christmas Blizzard</li> <li>• March 2017 snowstorm resulted in blocked roads throughout the city and county</li> <li>• Major blizzard in fall of 2018</li> <li>• Spring and fall snowstorms of 2019</li> <li>• <b>Second heaviest snow fall on record during 2008/2009 winter season</b></li> </ul>
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> <li>• Impacts can be expected county-wide</li> <li>• <b>Freezing rain will contribute to an increase in the likelihood and frequency of impacts from severe winter weather</b></li> </ul> <ul style="list-style-type: none"> <li>• City of Valley City located at confluence of high- and low-pressure systems which contributes to extreme weather</li> <li>• Removal of shelter belts and vegetation around the city leads to more ground blizzard conditions</li> <li>• Topography of the city being in a closed basin contributes to impacts of the hazard</li> </ul>

Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment – Continued

Severe Winter Weather	
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Blocked roads increases difficulty for elderly residents to travel and access necessary medical services</li> <li>• <b>City is location of substantial critical facilities and infrastructure (WAPA transmission lines, Barnes County Courthouse, Barnes County Law Enforcement Center, etc.)</b></li> <li>• City sanitary sewer system is inundated by flood waters resulting from heavy precipitation and inadequate</li> <li>• Interstate 94 traverse’s city limits</li> <li>• Downtown buildings with flat roofs are vulnerable</li> <li>• Lack of education to the public on power conductivity of trees and power lines</li> <li>• <b>Lack of generators for drinking/potable water system</b></li> <li>• <b>Lack of permanent backup generator at VCSU</b></li> <li>• <b>Lack of portable backup generators for city public works and emergency services</b></li> <li>• <b>Undersized permanent generator at CCHD - facility used for mass sheltering, testing, vaccination activity</b></li> <li>• Prolonged response times and limited access for emergency services from blocked roads resulting from debris and water</li> <li>• Railroad infrastructure traversing city limits</li> <li>• Barnes County lacks a debris management plan</li> <li>• <b>Presence of undersized and cast-iron water mains</b></li> <li>• <b>Low-lying areas near bridge over Sheyenne River with potential impact to city infrastructure</b></li> <li>• <b>Presence of undersized and cast-iron water mains which are susceptible to breaks from freezing and thawing</b></li> <li>• <b>Sanitary sewer inflow and infiltration issues citywide</b></li> <li>• <b>City electrical infrastructure located in low-lying areas and inundated by trees and vegetation</b></li> </ul>
	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV – all landline phones are signed up for Barnes Alerts</li> <li>• Building codes and enforcement</li> <li>• Installation of new flood control measures reduces amount of standing water and flood damage to homes</li> <li>• City maintains an inert landfill</li> <li>• City residents have equipment and volunteer time and resources for response and recovery</li> <li>• City streets are on a continuing schedule for maintenance and repair</li> <li>• Dispatch-activated emergency sirens</li> <li>• Extensive manpower and volunteers on Valley City Fire Department and Valley City Rural Fire Protection District</li> <li>• Fire Departments have equipment for moving of water and debris</li> <li>• High winds does not allow accumulation of snow on top of structures resulting in lower snow loads on roofs</li> <li>• <b>Program to main continuous power</b></li> <li>• Well-trained and educated EMT and ambulance staff</li> <li>• <b>Permanent backup generator at CHI-Mercy Hospital to power the facility in its entirety from loss of power – needs upgrading</b></li> <li>• <b>Permanent backup generator at city’s Main Lift Station to maintain continuous power and mitigate sewer backups and property damage</b></li> </ul>

Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment – Continued

	Space Weather	
<b>Impact</b>	<ul style="list-style-type: none"> <li>Loss of operation of the Valley City City Hall, Valley City Public Schools, lift stations, fire and ambulance hall, law enforcement center, etc.</li> <li>Loss/outage of medical devices at private residences</li> <li>Property damage from sewer backups due to loss of lift stations</li> </ul>	<ul style="list-style-type: none"> <li>Loss of digital infrastructure at Valley City City Hall, Barnes County Courthouse, Barnes County Law Enforcement Center, CHI-Mercy Hospital, Barnes County Correctional Center, Valley City State University, public schools, utility infrastructure, and other long-term care or specialty facilities such as nursing homes and senior housing facilities</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>Never a recorded occurrence in Barnes County or North Dakota</li> </ul>	
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>Dependent on solar activity and the 11-year solar cycle</li> </ul>	<ul style="list-style-type: none"> <li>Likely to occur once every 500 years per the 2018 N.D. Enhanced Mitigation MAOP</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Advanced warning and notification such as internet and TV – over-reliance on these systems for information to support society</li> <li>All critical facilities and infrastructure that require electricity for operation</li> <li>Digitization and subsequent mechanization of the agriculture economy</li> <li>Increasing dependency of technological/digital systems in agriculture, private, and public sectors</li> <li><b>Lack of faraday cages/shields around technological/digital infrastructure at critical facilities and infrastructure</b></li> <li><b>Sewer and water systems managed by SCADA</b></li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>Local food production/households with gardens</li> <li>Advanced warning and notification such as internet and TV</li> <li>Gas-powered backup generators for critical facilities and infrastructure</li> <li>CHI-Mercy Hospital acts as a faraday cage for its digital/technology infrastructure due to its construction</li> </ul>
<b>Capability</b>	<ul style="list-style-type: none"> <li>Valley City City Council</li> <li>Valley City Strategic Plan</li> <li>Valley City Public School District School Board</li> <li>Barnes County IT</li> <li>Valley City State University IT</li> </ul>	<ul style="list-style-type: none"> <li>2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)</li> <li>Barnes County Local Emergency Operations Plan (LEOP)</li> <li>Barnes County Threat and Hazard Identification and Risk Assessment (THIRA)</li> </ul>

Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment – Continued

	Transportation Incident	
Impact	<ul style="list-style-type: none"> <li>• Business Interruptions</li> <li>• <b>Blocked roads from inadequate road clearing and incidents of severe weather</b></li> <li>• Delayed Emergency Response</li> <li>• <b>HAZMAT Release</b></li> <li>• Human Injury/Death</li> <li>• Increased Fire Potential</li> <li>• Loss of Livestock</li> <li>• Loss of Transportation/Accessibility</li> </ul>	<ul style="list-style-type: none"> <li>• Mass Casualties/Fatalities</li> <li>• Property &amp; Vehicle Damage</li> <li>• Can result in fires of buildings, land, equipment and vehicles</li> <li>• <b>Could be catastrophic if involving a school bus filled with children and a truck carrying hazardous materials</b></li> <li>• <b>Financial drain and reduced productivity in local government performing normal city services as they become overwhelmed during an accident</b></li> </ul>
Frequency	<ul style="list-style-type: none"> <li>• Small to moderate traffic accidents occurring daily in the city of Valley City</li> <li>• <b>A major incident occurs annually on Interstate 94 resulting in one or more fatalities</b></li> </ul>	<ul style="list-style-type: none"> <li>• Accident in December 2012 involving passenger truck and commercial truck resulting in six fatalities</li> <li>• Accident in February 2015 involving car operator crossing guard rail and striking oncoming truck resulting in a fatality</li> </ul>
Likelihood	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• <b>City lacks “complete streets” with areas missing adequate sidewalks and crosswalks</b></li> <li>• City located at the junction of major railroad lines, three major highways, and the only commercial passenger air service in the region</li> <li>• <b>DAPL pipeline court ruling could cause rail traffic to increase</b></li> <li>• High truck traffic from agriculture-related traffic</li> <li>• <b>Lack of designated truck route</b></li> <li>• <b>Presence of railroad infrastructure</b></li> <li>• <b>Presence of Interstate 94</b></li> <li>• <b>Presence of pipelines</b></li> <li>• Commercial passenger service at Barnes County Municipal Airport</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Adequate traffic enforcement by city police department</li> <li>• Adequate enforcement by County Sheriff on county roads surrounding the city</li> <li>• City streets are on a continuing schedule for maintenance and repair</li> <li>• City Forester currently active in building living snow fences and maintain visibility at intersection through proper placement of trees</li> <li>• Ordinances restricting use of recreational vehicles in city limits</li> <li>• <b>Public works has plowing and road clearing equipment</b></li> <li>• Railroad oil traffic decreased by 75 percent once the Dakota Access Pipeline opened</li> </ul>

Table 8.12.2.1 – City of Valley City Jurisdiction Risk Assessment – Continued

Transportation Incident			
<b>Vulnerability</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• <b>City lacks “complete streets” with areas missing adequate sidewalks and crosswalks</b></li> <li>• City located at the junction of major railroad lines, three major highways, and the only commercial passenger air service in the region</li> <li>• <b>DAPL pipeline court ruling could cause rail traffic to increase</b></li> <li>• High truck traffic from agriculture-related traffic</li> <li>• Intoxicated drivers</li> <li>• <b>Lack of designated truck route in the city</b></li> <li>• <b>Presence of railroad infrastructure</b></li> <li>• <b>Presence of Interstate 94</b></li> <li>• <b>Presence of pipelines</b></li> <li>• Barnes County Municipal Airport</li> <li>• <b>Hospital Bridge needs deck overlay</b></li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Adequate traffic enforcement by city police department</li> <li>• Adequate enforcement by County Sheriff on county roads surrounding the city</li> <li>• Ordinances restricting use of recreational vehicles</li> <li>• City streets are on a continuing schedule for maintenance</li> <li>• City Forester currently active in building living snow fences and maintain visibility at intersection through proper placement of trees</li> <li>• Extensive manpower and volunteers on Valley City Fire Department and Valley City Rural Fire Protection District</li> <li>• Fire Departments have equipment for moving of wreckage and/or debris</li> <li>• <b>CHI-Mercy Hospital and clinics</b></li> <li>• <b>Public works has plowing and road clearing equipment</b></li> <li>• Railroad oil traffic decreased by 75 percent once the Dakota Access Pipeline opened</li> </ul> </td> </tr> </table>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• <b>City lacks “complete streets” with areas missing adequate sidewalks and crosswalks</b></li> <li>• City located at the junction of major railroad lines, three major highways, and the only commercial passenger air service in the region</li> <li>• <b>DAPL pipeline court ruling could cause rail traffic to increase</b></li> <li>• High truck traffic from agriculture-related traffic</li> <li>• Intoxicated drivers</li> <li>• <b>Lack of designated truck route in the city</b></li> <li>• <b>Presence of railroad infrastructure</b></li> <li>• <b>Presence of Interstate 94</b></li> <li>• <b>Presence of pipelines</b></li> <li>• Barnes County Municipal Airport</li> <li>• <b>Hospital Bridge needs deck overlay</b></li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Adequate traffic enforcement by city police department</li> <li>• Adequate enforcement by County Sheriff on county roads surrounding the city</li> <li>• Ordinances restricting use of recreational vehicles</li> <li>• City streets are on a continuing schedule for maintenance</li> <li>• City Forester currently active in building living snow fences and maintain visibility at intersection through proper placement of trees</li> <li>• Extensive manpower and volunteers on Valley City Fire Department and Valley City Rural Fire Protection District</li> <li>• Fire Departments have equipment for moving of wreckage and/or debris</li> <li>• <b>CHI-Mercy Hospital and clinics</b></li> <li>• <b>Public works has plowing and road clearing equipment</b></li> <li>• Railroad oil traffic decreased by 75 percent once the Dakota Access Pipeline opened</li> </ul>
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### 8.12.3 City of Valley City, North Dakota Mitigation Strategy

The Barnes County Multi-Jurisdictional Multi-Hazard Plan Update includes a mitigation strategy consisting of seven goals in Chapter 6. The following problem statement and mitigation projects address the mitigation needs of the city of Valley City.

#### **Problem Statement**

The city of Valley City is impacted through injury, loss of life, loss of economy, and property damage from civil disturbance; criminal, terrorist or nation-state attack, cyberattack, dam failure, drought, fire (urban and wildland), flood, geologic hazard, hazardous material release, infectious disease, severe summer weather, severe winter weather, space weather, and transportation incident. The city of Valley City is located on the Sheyenne River, which is controlled by the Baldhill Dam. However, flooding (riverine and overland) has continued to impact the city's drinking/potable water, sanitary sewer, and storm water system. Hazardous material release, shortage or outage of critical materials and infrastructure, and transportation incidents are cause for concern due to a growing population, increase in shipment of oil and chemicals via truck and railroad transportation, and an increase in industrial development. The city contains numerous vulnerable populations such as the Barnes County Correctional Center, CHI-Mercy Hospital, the only assisted living and senior housing developments in Barnes County, dormitory populations at Valley City State University, trailer/mobile home courts, a substantial elderly population, public and private elementary schools, and the largest middle school/high school between Jamestown and Fargo. Permanent backup generators have been installed at the city's main lift station, but additional generators are needed at critical facilities and infrastructure. The city has large infrastructure projects that need engineering studies completed to identify best options or alternatives.

The city of Valley City has administrative and technical, education and outreach, financial, and planning and regulatory capabilities to accomplish mitigation. However, the city relies on outside capital for construction of permanent flood protection, retrofitting/upgrading existing or construction new critical facilities and infrastructure, and large-scale mitigation projects.

Improvements/increases to administrative and technical, education and outreach, financial, and planning and regulatory capabilities are needed. In addition, permanent flood protection, flood control measures, buyouts of structures in hazard prone areas, installation of permanent generators at critical facilities and infrastructure, and conducting engineering studies to identify options for retrofitting/upgrading existing or construction new critical facilities and infrastructure are a priority for the city.

**City of Valley City Project AT-1: Install new permanent generators and/or upgrade existing permanent or portable generators at critical facilities and infrastructure.**

Description/Benefit	<p>Install new generators (permanent or portable) to establish sources of backup power to maintain continued operation of critical facilities and infrastructure. Test existing generators and create regularly scheduled maintenance system. Lift stations, pump stations, and booster stations need pigtails for generators. <b>Build additional redundancies in power grid systems, where possible.</b></p> <p><b><u>New (permanent):</u></b> Valley City City Hall and Valley City Police Department Police Station (potentially combined into one large generator with the fire department), Graichen Gym – VCSU, Methodist Church, Valley City Auditorium, Valley City High School, Valley City Rec Center, We Osmon Fieldhouse - VCSU</p> <p><b><u>Upgraded (permanent):</u></b> City-County Health District, CHI-Mercy Hospital, Sheyenne Care Center, Master Lift Station, Valley City Fire Department Fire Hall</p> <p><b><u>Portable:</u></b> City water systems/equipment/water towers. Possibility for one shared between city hall, fire hall, police.</p>						
Hazard/Threat Addressed	All hazards						
Affected Jurisdiction(s)	City of Valley City						
Project Status	Ongoing and Continue						
Priority	Very High						
Responsible Agency	City Council, Emergency Services, Engineering, private contractors, Public Works						
Partners	Emergency Management, Public Utilities, private contractors, DWR						
Completion Timeframe	Ongoing	Cost		Project-specific			
Funding Source	Public Utilities, Regional Council, RD. FEMA’s Building Resilient Infrastructure and Communities (BRIC). State Homeland Security grants. Private contractors writing grants. DWR.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	3	5	33
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Valley City Capital Improvement Plan Valley City Comprehensive Plan		Capability Assessment, Hazard History, Risk Assessment			Conduct engineering study to identify scope of work. Apply for grant funding or purchase directly using existing tax revenue. Approval by city council/agency/entity.		



**City of Valley City Project AT-2: Conduct engineering studies to upgrade and/or retrofit the city’s drinking/potable water system.**

Description/Benefit	<p>The city’s drinking/potable water system is impacted by ground moisture/overland flooding and shifting soils from severe weather. Portions of the system are still cast iron, which are brittle and susceptible to breaks. The system is also undersized in some areas for fire protection needs and should be upgraded. The ability of the city to store water is adequate during drought and other severe weather, but pressure from the water tower is an ongoing issue. The city does not have any preliminary engineering studies or developed scopes of work to pursue grant funding to retrofit and/or upgrade. Engineering studies are needed first to execute the following projects:</p> <ul style="list-style-type: none"> <li>• Install upgraded water tower</li> <li>• Upgrade all cast iron pipes to PVC</li> <li>• Upgrade all 4” water mains to 8” water mains</li> <li>• Identify retrofits to sections of the system located in areas prone to geologic hazards</li> <li>• Eliminate lead lines and upgrade to poly or copper or flex pipe</li> <li>• Upgrade fire hydrants as appropriate in conjunction with upgraded cast iron pipes</li> <li>• Dredging and rip-rapping the city reservoir</li> </ul>						
Hazard/Threat Addressed	Drought, Fire, Flood (overland), HAZMAT, Severe Summer Weather, Severe Winter Weather (All)						
Affected Jurisdiction(s)	City of Valley City and Greater Barnes County						
Project Status	New/Ongoing and Continue						
Priority	High						
Responsible Agency	City Council, engineering firms, Public Works						
Partners	Emergency Management, Emergency Services, FEMA, NDDES, engineering firms, private contractors, DWR						
Completion Timeframe	Ongoing	Cost	Project-specific				
Funding Source	FEMA’s Building Resilient Infrastructure and Communities (BRIC). Local budgets. NDDEQ. Prairie Dog Fund. DWR.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	5	2	4	29
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Valley City Capital Improvement Plan Valley City Comprehensive Plan		Capability Assessment, Hazard History, Risk Assessment			Commission studies through a formal bidding process. Select contractor. Apply for grant funding to execute or budget in local budgets.		

**City of Valley City Project AT-3: Conduct engineering studies to upgrade and/or retrofit the city’s sanitary sewer system.**

Description/Benefit		To reduce or eliminate health hazards from infectious diseases spawned from leakage of sanitary sewer system, and to prevent outage of sanitary sewer service to city residents. The sanitary sewer system is inundated during high river levels and saturated ground conditions. The clay tile sewer mains and manholes allow ground water and tree roots to infiltrate the system overwhelming lift stations and preventing flow of material causing backups. The local service lines from the public infrastructure to private users is also inundated on a regular basis.					
		<ul style="list-style-type: none"> <li>• Upgrade existing clay tile pipes to PVC</li> <li>• Upgrade master lift station and satellite lift stations, when needed</li> <li>• Lagoon cells need to be dredged</li> <li>• Monitor rip-rap on the banks of the lagoon cells</li> <li>• Monitor discharge pumps</li> <li>• Expansion of sewer lagoon to increase capacity</li> </ul>					
Hazard/Threat Addressed		Drought, Fire (Urban), Flood (overland), Infectious Disease, Severe Summer Weather, Severe Winter Weather (All)					
Affected Jurisdiction(s)		City of Valley City and greater Barnes County					
Project Status		Ongoing and continue					
Priority		High					
Responsible Agency		City Council, engineering firms, Public Works,					
Partners		Emergency Management, Emergency Services, FEMA, NDDES, engineering firms, private contractors, NDDEQ					
Completion Timeframe		Ongoing	Cost		Project-specific		
Funding Source		FEMA’s Building Resilient Infrastructure and Communities (BRIC). NDDEQ – Clean Water SRF.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	5	2	3	28
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Valley City Capital Improvement Plan Valley City Comprehensive Plan		Capability Assessment, Hazard History, Risk Assessment			Commission studies through a formal bidding process. Select contractor. Apply for grant funding to execute or budget in local budgets.		

**City of Valley City Project AT-4: Conduct engineering studies to upgrade and/or retrofit the city’s storm water system.**

Description/Benefit	<p>The storm sewer system is inundated during high river levels, saturated ground conditions, shifting soils, and land subsidence (sinkholes). The system is comprised of clay tile, concrete, PVC, and brick which allows ground water to infiltrate the system. Sinkholes in the system have resulted in city streets collapsing. Heavy precipitation events result in manhole covers popping out of the street. Flooded streets and backup into homes has occurred when the system is at or over capacity, essentially becoming man-made overland flooding.</p> <p><u>Overland flooding/drainage issues</u></p> <ul style="list-style-type: none"> <li>• Viking Circle neighborhood</li> <li>• 9<sup>th</sup> St. SW and 10<sup>th</sup> St. SW from 11<sup>th</sup> Ave SW to 15<sup>th</sup> Ave SW</li> <li>• 4<sup>th</sup> Ave NW near 10<sup>th</sup> St. NW / Secarse Drive</li> </ul> <p><u>Undersized storm sewers to upgrade/retrofit</u></p> <ul style="list-style-type: none"> <li>• 3<sup>rd</sup> Ave NW and 4<sup>th</sup> St. NW</li> <li>• 8<sup>th</sup> Ave SW to Sheyenne River</li> <li>• 6<sup>th</sup> Ave SE and Valley Ave SE</li> <li>• Main Street from 5<sup>th</sup> Ave W west to city limit boundary</li> </ul> <p><u>Expansion areas</u></p> <ul style="list-style-type: none"> <li>• 3<sup>rd</sup> St. NW west of 9<sup>th</sup> Ave NW</li> <li>• All areas in city limits south of Interstate 94</li> </ul>						
Hazard/Threat Addressed	Flood (overland and riverine), Infectious Disease, Severe Summer Weather, Severe Winter Weather (All)						
Affected Jurisdiction(s)	City of Valley City						
Project Status	New						
Priority	Very High						
Responsible Agency	City Council, Public Works, engineering firms, private contractors, private property owners						
Partners	Emergency Management, Emergency Services, FEMA, NDDDES, NRCS, DWR, Water Resource Board, USACE						
Completion Timeframe	Ongoing	Cost	Project-specific				
Funding Source	FEMA’s Building Resilient Infrastructure and Communities (BRIC). DWR. USACE. Water Resource Board.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	5	2	3	28
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Valley City Capital Improvement Plan		Capability Assessment, Hazard History, Risk Assessment			Commission studies through a formal bidding process. Select contractor. Apply for grant funding to execute or budget in local budgets.		

**City of Valley City Project AT-5: Conduct engineering studies to upgrade and/or retrofit the city’s electrical distribution and transmission infrastructure system.**

Description/Benefit	<p>The city of Valley City owns and maintains its own electricity distribution and transmission infrastructure. The infrastructure is in low-lying areas that are prone to impacts from flooding. Trees and vegetation are inundated by severe weather and impact the system causing damage.</p> <ul style="list-style-type: none"> <li>• The Downtown substation is in the flood plain and needs to be relocated.</li> <li>• Some transformers are in low-lying areas and are susceptible to impacts from overland and riverine flooding. They need to be raised.</li> <li>• Infrastructure is inundated from tree branches and other vegetations causing outages and disrupting service.</li> </ul>						
Hazard/Threat Addressed	Fire, Flood (overland and riverine), Infectious Disease, Severe Summer Weather, Severe Winter Weather (All)						
Affected Jurisdiction(s)	City of Valley City						
Project Status	New						
Priority	High						
Responsible Agency	City Council, Public Works, engineering firms, private contractors						
Partners	Emergency Management, Emergency Services, MRES, WAPA						
Completion Timeframe	5+ years	Cost	\$5,000,000+				
Funding Source	FEMA’s Building Resilient Infrastructure and Communities (BRIC). DWR. USACE. Water Resource Board.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	3	5	4	1	3	26
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Valley City Capital Improvement Plan Valley City Comprehensive Plan		Capability Assessment, Hazard History, Risk Assessment			Commission studies through a formal bidding process. Select contractor. Apply for grant funding to execute or budget in local budgets.		

**City of Valley City Project AT-6: Conduct engineering studies on landslide areas to reduce/eliminate geologic hazards.**

Description/Benefit	<ul style="list-style-type: none"> <li>• Landslide areas near 14<sup>th</sup> St. SW impacting water, sewer, and roadway infrastructure (Crestwood Addition)</li> <li>• Landslides on Main St. East between I-94 Exit 294 and 15<sup>th</sup> Ave NE</li> <li>• Landslides near 12<sup>th</sup> Ave SE near John Deere Seeding</li> <li>• Landslides on Main St. West near County Highway 19 and south and west of junction of I-94 and County Highway 19</li> <li>• Hillsides on the southside of VCSU</li> <li>• East of city limits adjacent to CP Railway near the country club</li> <li>• On 9<sup>th</sup> Ave NW north of Pioneer Park to 12<sup>th</sup> St. NW</li> </ul>						
Hazard/Threat Addressed	Geologic Hazards, Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	City of Valley City and Greater Barnes County						
Project Status	New						
Priority	High						
Responsible Agency	City Council, Public Works, engineering firms, private contractors, private property owners						
Partners	Emergency Management, Emergency Services, FEMA, NDDES, NRCS, DWR						
Completion Timeframe	Ongoing			Cost		Project-specific	
Funding Source	City budgets. FEMA’s Building Resilient Infrastructure and Communities (BRIC).						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	3	3	2	3	26
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Valley City Capital Improvement Plan Valley City Comprehensive Plan Valley City Transportation Plan		Capability Assessment, Hazard History, Risk Assessment			Commission studies through a formal bidding process. Apply for grant funding to execute or budget in local budgets. Select contractor and execute study.		

**City of Valley City Project AT-7: Install Faraday Cages/Shields for digital/technological infrastructure systems at critical facilities and infrastructure.**

Description/Benefit	<p>A Faraday Cage or Shield is an enclosure used to block electromagnetic fields from technological/digital infrastructure systems. Due to increasing dependency of technological/digital systems in private and public sectors, a space weather event of significance could destroy all local government information resulting in a complete shutdown of government operations.</p> <p>The potential loss of technological/digital infrastructure could occur at, but is not limited to, the following critical facilities and infrastructure: CHI-Mercy Hospital, Valley City City Hall, Valley City Fire Department Fire Hall, Valley City Police Department, Valley City State University, communication towers, generators, phone systems, correctional centers, public schools, Sheyenne Valley Career Center, substations, drinking/potable water infrastructure, lift stations, water tower, storm water, public works facilities, water treatment plant, transfer station, electrical grids, and other specialty facilities such as nursing homes and senior housing facilities.</p>						
Hazard/Threat Addressed	Space Weather						
Affected Jurisdiction(s)	City of Valley City and greater Barnes County, where applicable						
Project Status	New						
Priority	Medium						
Responsible Agency	City Council, County Commission, Emergency Management, Emergency Services, Barnes County IT (includes city)						
Partners	Medical Service Providers, Engineering, NDIR						
Completion Timeframe	Ongoing	Cost		Project-specific			
Funding Source	Local budgets. State and federal grants.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Valley City Capital Improvement Plan Valley City Comprehensive Plan		Capability Assessment, Hazard History, Risk Assessment			Development specifications and receive approval from city council/agency/respective board. Apply for grant funding or fund independently.		

**City of Valley City Project AT-8: Upgrade and/or expand outdoor early warning system(s).**

Description/Benefit	To expand the coverage area and upgrade outdoor warning sirens to provide citizens of the city of Valley City adequate time to seek shelter. Support the operation of the Barnes County Everbridge system.						
	<ul style="list-style-type: none"> <li>Upgrade sirens from DC power to AC power with new components</li> </ul>						
Hazard/Threat Addressed	Civil Disturbance; Criminal, Terrorist or Nation-State Attack, Dam Failure, Fire (Wildland), Hazardous Material Release, Severe Summer Weather, Severe Winter Weather (All)						
Affected Jurisdiction(s)	City of Valley City and Greater Barnes County						
Project Status	Ongoing and Continue						
Priority	High						
Responsible Agency	City Council, Emergency Management, Emergency Services, Barnes County Dispatch						
Partners	FEMA, NDDDES, NWS, Public Works, Barnes County IT						
Completion Timeframe	Ongoing			Cost	Siren: Up to \$25,000 per siren / \$11,000 for software to operate sirens Barnes County Everbridge: \$7,000 annually		
Funding Source	9-1-1 funding. State Homeland Security Grant Program. FEMA.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Valley City Capital Improvement Plan Valley City Comprehensive Plan		Capability Assessment, Hazard History, Risk Assessment			Develop specifications. Received EHP approval. Pursue grant funding. Approval by county commission/city council.		

**City of Valley City Project AT-9: Install homeland security measures at critical facilities and infrastructure.**

Description/Benefit	<p>The city of Valley City's city hall, Valley City Fire Department Fire Hall, Valley City Police Department, substations, transfer station water treatment plant, well field, water reservoir, water towers and out-buildings, pumping stations, city shops and mechanical buildings, city storage buildings/miscellaneous structures, public and private schools, and flood control equipment lack security measures and are vulnerable to adversarial threats.</p> <p>Installation of (but not limited to) door alarms, door locks, enhanced lighting, security fencing, motion-detecting systems, and security camera surveillance systems are needed to mitigate adversarial threats.</p> <p><b>Establish interface between Valley City City Hall/Fire Hall/Police Station alarm system and county dispatch system.</b></p>						
Hazard/Threat Addressed	Civil Disturbance; Criminal, Terrorist, or Nation/State Attack, Fire (Urban), Transportation Incident (All)						
Affected Jurisdiction(s)	City of Valley City and great Barnes County						
Project Status	New						
Priority	Very High						
Responsible Agency	City Council, Emergency Services, Public Works						
Partners	Emergency Management, Dept. Homeland Security, NDDDES, private contractors						
Completion Timeframe	3 to 5 years	Cost	Project-specific				
Funding Source	Local budgets and department staff and resources. State Homeland Security Grants.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	5	4	4	32
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Valley City Capital Improvement Plan Valley City Comprehensive Plan		Capability Assessment, Hazard History, Risk Assessment			Develop scope of work and procure bids/quotes. Select contractor. Apply for grant funding to execute.		



**City of Valley City Project AT-10: Purchase and install Upgraded ArborPro Tree Inventory & Management Software Program.**

Description/Benefit	<p>The ArborPro Tree Inventory &amp; Management Software Program creates an inventory of all publicly owned trees in the city of Valley City. The software mostly encompasses trees at the city parks, boulevard trees, and any trees on city building sites, such as city hall. The software aids in making forest management decisions based on the population of trees, as in areas that are barren of trees needing more, areas over-populated needing less, composition of canopy (aging and in need of rejuvenation, lacking diversity and risk to epidemic, infestation, or environmental issue such as windstorm, drought, or blizzard. The number of trees in general justifies a normal forestry budget. The U.S. average dollars per capita spent on a forestry budget is around \$8.00 per capita.</p> <p>The software automatically calculates money value per tree, storm water runoff avoidance, air pollution filtration, heating and cooling cost savings, safety/hazard ratings, and tree health. Plans of action can be assigned to each tree, including planting, removal, trimming, treating for insects or disease, cabling, bracing, guying, and inspection. If there is a known natural hazard, the software allows documentation of that hazard and allows a time-bound plan of action, which removes a large portion of liability for the city. The inventory also helps with determining FEMA costs for natural disasters</p> <p>Tree Plotter: <a href="https://pg-cloud.com/tpDemo/">https://pg-cloud.com/tpDemo/</a> Arbor Pro: <a href="https://arborprousa.com/software">https://arborprousa.com/software</a></p>						
Hazard/Threat Addressed	Drought, Fire, Flood, Geologic Hazards, Infectious Disease, Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	City of Valley City						
Project Status	New						
Priority	Medium						
Responsible Agency	City Council, City Forester, private arborists						
Partners	Emergency Management, Emergency Services						
Completion Timeframe	Ongoing and Continue	Cost	\$2,250 annually				
Funding Source	Local budgets.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Valley City Capital Improvement Plan Valley City Comprehensive Plan		Capability Assessment, Hazard History, Risk Assessment			Incorporate into city forestry budget. Renew subscription on an annual basis.		

**City of Valley City Project AT-11: Continue pre-incident surveys and response planning for Valley City Fire Department.**

Description/Benefit	Support the city and rural fire in compiling information in advance to respond to calls for service. Assist local businesses in creation of safety planning per requirements of OSHA, Tier II reporting, among other entities.						
Hazard/Threat Addressed	Fire, Flood, HAZMAT, Severe Summer Weather, Severe Winter Weather, Transportation Incident (All)						
Affected Jurisdiction(s)	City of Valley City and greater Barnes County, where applicable						
Project Status	Ongoing and Continue						
Priority	Medium						
Responsible Agency	Valley City Fire Department, Valley City Rural Fire Protection District						
Partners	Emergency Management, commercial facilities, industrial facilities, Tier II facilities						
Completion Timeframe	5 years	Cost	\$40,000 to \$60,000				
Funding Source	Local budgets. State and federal grants.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Valley City Capital Improvement Plan Valley City Comprehensive Plan		Capability Assessment, Hazard History, Risk Assessment			Support collaborative efforts between fire departments and other local government entities and emergency services.		

**City of Valley City Project AT-12: Support the State Water Commission’s Base-Level Elevation (BLE)/Flood Risk Mapping Project.**

Description/Benefit	The State Water Commission received a federal grant from FEMA to conduct a flood risk mapping project to provide base-level elevation engineering information for flood maps. The BLE flood maps can be used to advance the understanding of the impacts of flood and contribute to the development of mitigation projects pertaining to incidents of flood.						
Hazard/Threat Addressed	Flood, Severe Summer Weather, Severe Winter Weather (All)						
Affected Jurisdiction(s)	City of Valley City and greater Barnes County, where applicable						
Project Status	New						
Priority	High						
Responsible Agency	DWR						
Partners	City Council, County Commission, Emergency Management, Emergency Services, Public Works, Road Department						
Completion Timeframe	5 years	Cost	100% federally funded – managed by NDDES				
Funding Source	Local budgets. State and federal grants.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Flood Ordinances National Flood Insurance Program Valley City Capital Improvement Plan Valley City Comprehensive Plan Valley City Emergency Flood Plan		Capability Assessment, Hazard History, Risk Assessment			Support collaborative efforts between DWR and local agencies to ensure project success and completion.		

**City of Valley City Project EO-1: Conduct education and outreach to improve household disaster preparedness.**

Description/Benefit	Continued education and outreach to keep households and vulnerable populations ready in case of a disaster. Special attention paid to maintaining and further developing severe weather awareness campaigns, are you prepared information, shelter-in-place pamphlets, fire prevention, school safety, storm spotters' program, among others. Specific attention should be given to flooding, hazardous materials, severe weather, fire, truck routes and safe routes to school. Use the city's website, social media, and local media outlets (Valley City Times Record, radio, Barnes County Everbridge, Facebook, Instagram, etc.) to improve household disaster preparedness. Make public aware of risk of shortage of critical materials and/or infrastructure and encourage citizens to be self-sufficient. Educate residents on the importance of <u>shelter-in-place</u> . <b>Encourage city inhabitants to have insurance to protect property from natural hazards and/or man-made threats.</b>						
Hazard/Threat Addressed	All hazards						
Affected Jurisdiction(s)	City of Valley City and greater Barnes County						
Project Status	Ongoing and Continue						
Priority	High						
Responsible Agency	City Council, Emergency Management, Emergency Services, Engineering, Public Works						
Partners	CCHD, FEMA, insurance companies, NDDDES, NWS, Public Utilities, Red Cross, social services						
Completion Timeframe	Ongoing	Cost	\$0 to \$10,000 annually				
Funding Source	Local, state, and federal grants. City budgets.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Valley City Capital Improvement Plan Valley City Comprehensive Plan Valley City Transportation Plan Valley City Emergency Flood Plan		Capability Assessment, Hazard History, Risk Assessment			Develop and review by appropriate departments or agencies. Review by state's attorney. Distribute by mail and/or publish online.		

**City of Valley City Project EO-2: Increase education and awareness of fire safety and prevention.**

Description/Benefit	Make the public aware of methods to remain safe from risk of fire and potential prevention methods. Keep areas around buildings and structures clear of grass, overgrown vegetation and debris. Specific attention should be paid to property owners in city limits with substantial vegetation to reduce fuels for wildland fires.						
Hazard/Threat Addressed	Fire, HAZMAT (All)						
Affected Jurisdiction(s)	City of Valley City						
Project Status	Ongoing and Continue						
Priority	High						
Responsible Agency	Valley City Fire Department, Valley City Rural Fire Protection District						
Partners	City Council, Emergency Management, Emergency Services						
Completion Timeframe	Ongoing	Cost	\$10,000 to \$15,000 annually				
Funding Source	Local budgets. State and federal grants.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Valley City Capital Improvement Plan Valley City Comprehensive Plan		Capability Assessment, Hazard History, Risk Assessment			Develop and review curriculum/presentations by fire chiefs. Approval by board.		

**City of Valley City F-1: Expand and improve existing or implement new financial mitigation capabilities.**

Description/Benefit	Expand financial mitigation capabilities to generate funds for completion of mitigation projects.						
	<ul style="list-style-type: none"> <li>• <b>Create and implement impact fees for new development.</b></li> <li>• <b>Restructure and improve building/zoning permit fees on a continuous basis.</b></li> <li>• <b>Restructure and increase utility fees (water, sanitation/recycling, sewer, electric) based on projected future infrastructure maintenance costs and necessary capital improvements.</b></li> <li>• <b>Research additional revenue generators such a franchise fees, wheel tax, etc.</b></li> <li>• <b>Investigate new grant funding opportunities through FEMA and other local, state, and federal sources – See Chapter 7.2</b></li> <li>• <b>Promote community endowment fund (Sheyenne Valley Community Foundation)</b></li> </ul>						
Hazard/Threat Addressed	All						
Affected Jurisdiction(s)	Barnes County and incorporated jurisdictions						
Project Status	New						
Priority	Very High						
Responsible Agency	County Commission and City Council(s)						
Partners	Emergency Management, Emergency Services, NDAC, NDLC, Planning & Zoning, Public Utilities						
Completion Timeframe	Ongoing			Cost	Staff-time		
Funding Source	Local budgets and staff time.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
3	5	5	2	5	5	5	30
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
City Councils and County Commission Planning Commission Valley City Capital Improvement Plan Valley City Comprehensive Plan		Capability Assessment, Hazard History, Risk Assessment			Research effectiveness. Approval and adoption by county commission and city councils.		

**City of Valley City Project PR-1: Update/expand existing and/or create new planning and regulatory capabilities to address existing and new development to strengthen local planning processes.**

Description/Benefit		<p>Build the planning and regulatory capability of the city of Valley City to ensure new and existing structures adhere to building standards to withstand impacts from hazards, and new development is located outside hazardous areas, to limit losses of life and property. <b>Specific research should be conducted to address building codes, continuity of operations, comprehensive planning, evacuation (multi-hazard), flood ordinances and management, forestry master plan, hazardous materials, impact fees, land use, mitigation, site plan review requirements, storm water management, strategic, and transportation.</b></p> <p><b>Additional consideration should be given to prioritize sewer backup valves when upgrading existing or building new development. Redundancies in the power grid systems should be encouraged. Specific attention should be paid to tie-down procedures for temporary buildings.</b></p> <p>Strengthening of building codes and land use regulations should be considered annually. Assure new development is built in areas with low risk to hazards.</p> <p>A list of plans, policies, codes and ordinances needing to be updated or created for Barnes County and incorporated jurisdictions are bolded in text narratives and are found in Chapter 7, Capability Assessment.</p>					
Hazard/Threat Addressed		All					
Affected Jurisdiction(s)		City of Valley City and Greater Barnes County					
Project Status		Ongoing and Continue					
Priority		High					
Responsible Agency		City Council; Building, Planning & Zoning; City Planning Contract; City Engineering Contract					
Partners		County Commission, Emergency Management, Emergency Services, NDACo, NDDES, NDLC, Public Works, RD					
Completion Timeframe		Ongoing	Cost	\$0 to \$100,000 / Staff-time			
Funding Source		Local budgets. State and federal grants. Private sector. Utility companies.					
<b>Values: 1 is low (negative impact and/or too costly) – Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	5	5	5	35
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
All		Capability Assessment, Hazard History, Risk Assessment			Development of specifications. Approval and adoption by county commission and city councils.		

**City of Valley City Project PR-2: Partner with Barnes County to create post-disaster debris management plan.**

Description/Benefit	Provide temporary staging site for disposal of waste from structures to improve resiliency and recovery efforts and maintain quality of life. The plan should be updated annually. The city’s transfer station/inert landfill has the capacity to stage post-disaster debris for disposal purposes.  <b>Establishment of a management plan increases disaster reimbursement from FEMA by five percent.</b>						
Hazard/Threat Addressed	All						
Affected Jurisdiction(s)	City of Valley City and Greater Barnes County						
Project Status	New						
Priority	High						
Responsible Agency	City council, County Commission, Emergency Management, Emergency Services, Planning & Zoning, Public Works						
Partners	FEMA, NDACo., NDDDES, NDDH, NDLC, private landowners						
Completion Timeframe	1 year		Cost	\$0 to \$3,000/staff-time			
Funding Source	Local budgets.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	2	5	3	29
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA City-County Health District(all plans) Valley City Capital Improvement Plan Valley City Comprehensive Plan Valley City Transportation Plan Valley City Emergency Flood Plan		Capability Assessment, Hazard History, Risk Assessment			Organize and update annual review. Approval and adoption by county commission and city councils.		



**Barnes County PR-3: Update Valley City Emergency Flood Plan on an annual basis.**

Description/Benefit	The City of Valley City has an emergency flood plan. The plan identifies strategies to evacuate the city to minimize loss of life and property from flooding events, and necessary protocols for response.						
Hazard/Threat Addressed	Dam Failure, Infectious Disease, Flood, Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	Barnes County and incorporated jurisdictions						
Project Status	New						
Priority	Very High						
Responsible Agency	County Commission, Emergency Management, Emergency Services, Planning & Zoning, Public Works						
Partners	City Council(s), NDDDES, Public Health, Public Utilities, DWR, Water Resource Board						
Completion Timeframe	Annually	Cost	Staff time				
Funding Source	Local budgets.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	5	5	5	34
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Flood Ordinances National Flood Insurance Program Valley City Capital Improvement Plan Valley City Comprehensive Plan Valley City Transportation Plan Valley City Emergency Flood Plan		Capability Assessment, Hazard History, Risk Assessment			Utilize the Barnes County LEPC or Mitigation Plan Steering Committee to update annually. Approval and adoption by county commission and city councils.		

**City of Valley City Project I-1: Remove existing infrastructure and structures from flood-prone areas.**

Description/Benefit	Improve economic resiliency. Residents with property at risk would be protected. Convert former lots into greenway for improved quality of life. Approximately 10 to 15 buy-outs remain as of September 2021. <ul style="list-style-type: none"> <li>• Downtown Substation</li> <li>• Buyouts of single-family homes needed in the southwest sections of the city near 14<sup>th</sup> St.</li> <li>• Buyouts of single-family homes near the master lift station</li> <li>• Buyouts of single-family homes near CHI-Mercy Hospital</li> <li>• Buyouts of single-family homes on Main St. East</li> </ul>						
Hazard/Threat Addressed	Flooding, Infectious Disease, Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	City of Valley City						
Project Status	Complete. Ongoing and continue.						
Priority	High						
Responsible Agency	City Council, Emergency Management, Engineering, Public Works						
Partners	Emergency Services, NDDes, FEMA, DWR, USACE						
Completion Timeframe	10 years		Cost	Project-specific			
Funding Source	Local budgets and departments staff and resources. State Homeland Security Grants.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
3	5	5	3	3	3	5	27
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Valley City Capital Improvement Plan Valley City Comprehensive Plan Valley City Transportation Plan Valley City Emergency Flood Plan		Capability Assessment, Hazard History, Risk Assessment			Develop scope of work and procure bids/quotes. Select contractor. Apply for grant funding to execute.		

**City of Valley City Project I-2: Remove existing infrastructure and structures from areas prone to geologic hazards.**

Description/Benefit	Economic resiliency. Residents with property at risk would be protected. Convert former lots into open space or wildlife habitat.						
	<ul style="list-style-type: none"> <li>• Single-family homes in the Crestwood Addition</li> <li>• Malach Main Manufacturing Plant</li> </ul>						
Hazard/Threat Addressed	Flooding, Geologic Hazards, Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	City of Valley City						
Project Status	Complete. Ongoing and continue.						
Priority	High						
Responsible Agency	City Council, Emergency Management, Public Works						
Partners	Emergency Management, Emergency Services, NDDES, FEMA, DWR, USACE						
Completion Timeframe	10 years	Cost	\$100,000 to \$1,000,000 per structure				
Funding Source	Local budgets and departments staff and resources. State Homeland Security Grants.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
3	5	5	3	3	3	5	27
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Valley City Capital Improvement Plan Valley City Comprehensive Plan Valley City Transportation Plan Valley City Emergency Flood Plan		Capability Assessment, Hazard History, Risk Assessment			Develop scope of work and procure bids/quotes. Select contractor. Apply for grant funding to execute.		

**City of Valley City Project I-3/Barnes County Project I-3: Construct new storm shelters/community safe rooms or retrofit existing structures to reduce the risk to vulnerable populations.**

Description/Benefit		Provide safe area of refuge for permanent residents, temporary populations, and seasonal/recreational populations from severe weather. Reduce/eliminate loss of life from hazards and man-made threats. Upgrade existing shelters to be fully ADA compliant and pet friendly. Construct new storm shelters/community safe room in locations currently lacking a storm shelter/safe room. More information on community shelters can be found through the following link: <a href="https://www.fema.gov/media-library/assets/documents/5090">https://www.fema.gov/media-library/assets/documents/5090</a>					
		Manufactured home communities are susceptible to inclement weather and therefore are highly vulnerable. Zoning ordinances need to be updated to require sheltering capacity be included in new manufactured housing developments and incorporated into existing developments.					
Hazard/Threat Addressed		All					
Affected Jurisdiction(s)		City of Valley City					
Project Status		Ongoing and Continue/New					
Priority		High					
Responsible Agency		City Council, Emergency Management, Emergency Services, engineering firms					
Partners		County Commission, NDDES, Red Cross, Social Services, private housing/community owners					
Completion Timeframe		3 to 5 years		Cost	\$75,000.00 to \$150,000.00 per shelter/room		
Funding Source		Local, state and federal grants. FEMA Pre-Disaster Mitigation Grant Program (PDM).					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	5	4	4	32
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
All		Capability Assessment, Hazard History, Risk Assessment			Approval by county commission, city councils, and private house/community owners. Development specs, apply for grant funding.		

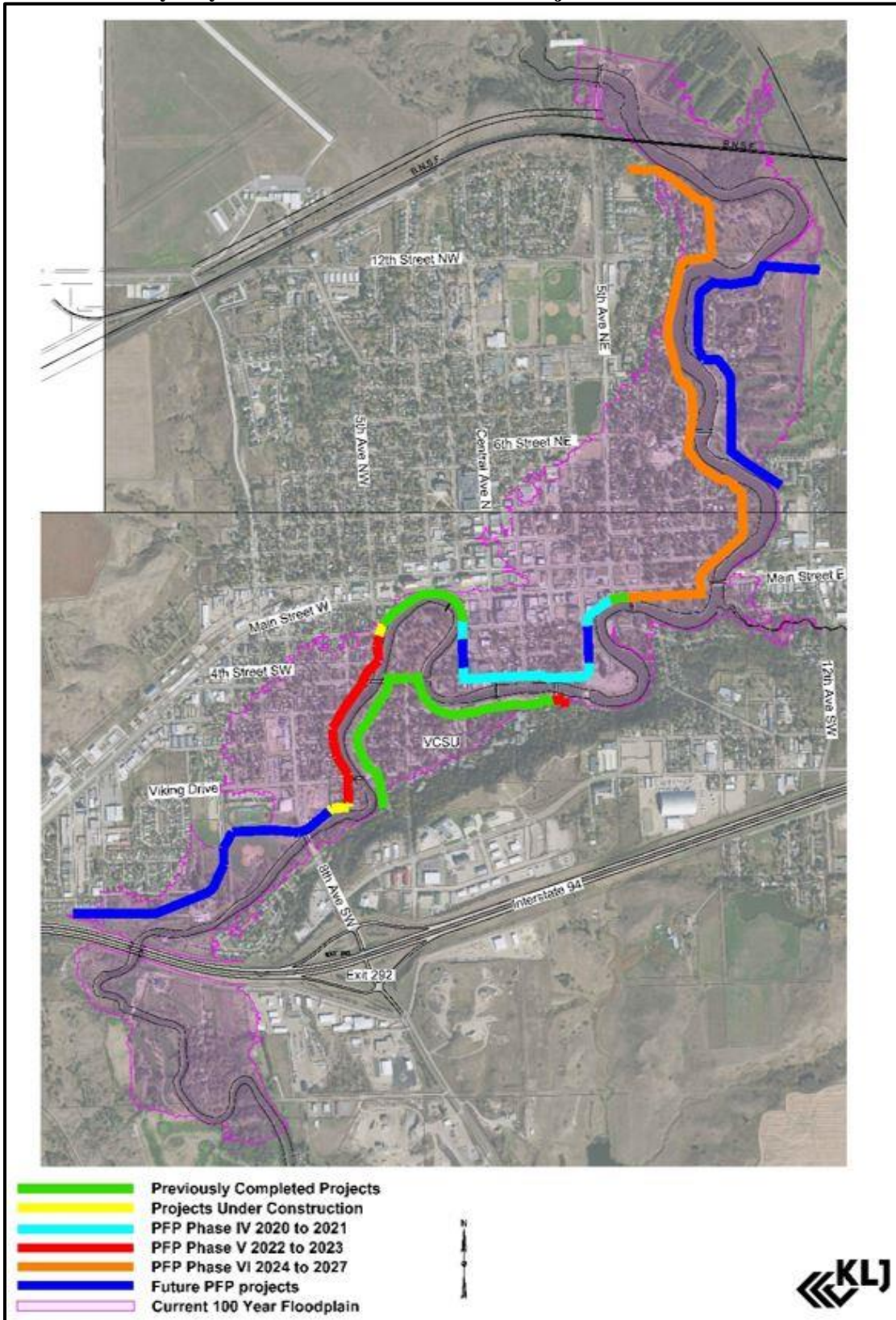
**City of Valley City Project I-4/Barnes County I-4: Maintain Sheyenne River Channel.**

Description/Benefit		Removal of debris to maintain flow of runoff to reduce/eliminate flooding and standing water, and control growth of vegetation to minimize fire hazard and spread of disease. Also, rebuild and stabilize riverbanks where necessary to reduce or eliminate flooding impacts on the city and its infrastructure.					
		<ul style="list-style-type: none"> <li>• Near Chautauqua Boulevard and 12<sup>th</sup> St. NE</li> <li>• 3<sup>rd</sup> Ave SE Bridge</li> <li>• Near 5<sup>th</sup> Ave SW and 3<sup>rd</sup> St. SW</li> <li>• 6<sup>th</sup> Ave SW and 6<sup>th</sup> St. SW</li> <li>• Riverview Drive</li> <li>• Bjornson Golf Course</li> </ul>					
Hazard/Threat Addressed		Flood (overland and riverine), Infectious Disease, Severe Summer Weather, Severe Winter Weather					
Affected Jurisdiction(s)		City of Valley City and greater Barnes County					
Project Status		Complete. Ongoing and continue.					
Priority		High					
Responsible Agency		City Council, FEMA, NDDES, Public Works, DWR, USACE					
Partners		Emergency Management, Emergency Services, Water Resource Board					
Completion Timeframe		Ongoing	Cost	Project-specific			
Funding Source		Local budgets and department staff and resources. FEMA’s Section 404 – Hazard Mitigation.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	2	3	3	3	26
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Flood Ordinances National Flood Insurance Program Valley City Comprehensive Plan Valley City Emergency Flood Plan		Capability Assessment, Hazard History, Risk Assessment			Commission studies through a formal bidding process. Select contractor. Apply for grant funding to execute or budget in local budgets.		

**City of Valley City Project I-5: Construct permanent engineered flood control protection on Sheyenne River within the city of Valley City.**

Description/Benefit	<p>To reduce and eliminate river flood damage to critical facilities and infrastructure, and public and private property in Valley City. As of March 18, 2021, \$59.8 million has been approved with \$47.0 million spent. Between July 2021 and June 2023, \$13.75 million is expected to be allocated. Between July 2023 and June 2025, \$15.0 million is expected to be allocated. Beyond 2025 another \$54.5 million is expected to be allocated. See Figure 8.12.3.1 on the following page.</p> <ul style="list-style-type: none"> <li>• <b>The costs to fight the floods in 2009 and 2011 were \$16 million state and federal share and \$3 million local share</b></li> <li>• <b>Over 350,000 sandbags were placed in 2009.</b></li> <li>• <b>Approximately 90 properties have been bought out to-date totaling \$11.9 million in costs.</b></li> </ul> <p>Phase I (University District) was completed in 2016. Phase II (Downtown District) was completed in 2019. Phase III (Master Lift Station District) completed in 2020.</p>						
Hazard/Threat Addressed	Flood (overland and riverine), Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	City of Valley City and greater Barnes County						
Project Status	Ongoing and continue						
Priority	Very High						
Responsible Agency	City Council, Engineering						
Partners	Emergency Management, Emergency Services, FEMA, KLJ, NDDES, NDDOT, DWR, USACE						
Completion Timeframe	Early 2030s	Cost	\$100,000,000.00+				
Funding Source	80 percent cost share with State Water Commission and 20 percent local cost share						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
4	4	5	3	4	3	3	26
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA Flood Ordinances National Flood Insurance Program Valley City Capital Improvement Plan Valley City Comprehensive Plan Valley City Emergency Flood Plan		Capability Assessment, Hazard History, Risk Assessment			Conditional Letter of Map Revision. Ongoing as of October 1, 2021.		

**Figure 8.12.3.1 Valley City Permanent Flood Protection Project**



Source(s): KLJ

**City of Valley City Project I-6: Upgrade/retrofit the Mill Dam.**

Description/Benefit	The Mill Dam provides water supply to the city of Valley City reservoir for drinking/potable water purposes. Removal of the dam is not allowed as it will change the water elevations that were identified as necessary to support the Valley City Permanent Flood Protection Project. The dam is nearing the end of its useful life and needs to be upgraded to continue its municipal purpose. A feasibility study has been completed to reduce the roller effect.						
Hazard/Threat Addressed	Drought, Flood (overland and riverine), Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	City of Valley City and greater Barnes County						
Project Status	New						
Priority	Very High						
Responsible Agency	City Council, Engineering						
Partners	Emergency Management, Emergency Services, FEMA, KLJ, NDDES, DWR, USACE						
Completion Timeframe	3 to 5 years	Cost	\$2 to \$2.5 million				
Funding Source	State Water Commission. Potentially the Heritage Grant and Garrison Diversion Conservancy.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	4	4	3	3	29
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Barnes County Mitigation Plan Barnes County THIRA National Flood Insurance Program Valley City Capital Improvement Plan Valley City Comprehensive Plan		Capability Assessment, Hazard History, Risk Assessment			Develop scope of work and procure bids/quotes. Select contractor. Apply for grant funding to execute.		



### **8.13 City of Wimbledon, North Dakota**

The following profile includes information specific to the city of Wimbledon for mitigation planning purposes. The information included is as follows:

- Profile and Inventory;
- Risk Assessment;
- Hazard Scoring Notes;
- Mitigation Projects, and
- Capabilities for Mitigation.

#### **Integration into Planning Mechanisms**

The process for integration of the mitigation plan into existing planning mechanisms is discussed at the bottom of each mitigation project in section 8.13.3, in section 8.13.4, and in Chapter 6, Mitigation Strategy.

#### **Plan Maintenance**

Plan maintenance is shown in section 8.13.6.

#### **Critical Facilities and Infrastructure**

Figure 8.13.1 is a map of the city of Wimbledon provided by Barnes County Emergency Management.

Figure 8.13.1 – City of Wimbledon, North Dakota



Source(s): Barnes County Emergency Management

### 8.13.1 Profile and Inventory

The location, total population, vulnerable populations, housing units and household size, businesses, critical facilities and infrastructure, new and future development, services, jurisdictional buildings, emergency response services and utilities are shown for the city of Wimbledon. Detailed narratives follow each section heading to profile the city.

Detailed information on public buildings, services provided, emergency response services and utilities can be found in Chapter 3, Profile and Inventory.

#### Location

The city of Wimbledon is located on N.D. Highway 9, approximately 40 miles north-northwest of Valley City in Barnes County.

#### Population

Table 8.13.1 shows population trends for the city of Wimbledon from 1920 to 2010, with an estimate for 2019.

Per the 2010 U.S. Decennial Census, the city of Wimbledon has a population of 216 people, which is a decrease of 21 people (8.9 percent) from 237 people in 2000.

**Table 8.13.1 – 1920 to 2010 City of Wimbledon, North Dakota Population Statistics**

1920	1930	1940	1950	1960	1970	1980	1990	2000	2010	2019 (est.)
521	421	357	449	402	337	330	275	237	216	191

Source(s): U.S. Decennial Census; American Community Survey, 5-Year Estimates

#### Vulnerable Populations

Age. Per the 2015 to 2019 American Community Survey 5-Year Estimate, the population of the city of Wimbledon consists of 27 individuals under the age of 20 and 42 individuals aged 65 and older.

Daycares. There is one daycare/childcare center in the city of Wimbledon and is housed in the old school and is licensed for 30 children.

Poverty. Per the 2015 to 2019 American Community Survey 5-Year Estimate, there are six households in the city of Wimbledon that live below the poverty line.

Public Schools. The city of Wimbledon had a school but was closed and converted into residential units. However, the Barnes County North Public School is nine miles away and has a Wimbledon address.

Senior Housing Developments/Care Centers. There are no age-restricted, senior housing developments, or care centers in the city of Wimbledon.

### **Housing Units and Household Size**

The 2015 to 2019 American Community Survey 5-Year Estimate shows there is a total of 146 housing units in the city consisting of 100 single-family homes, five mobile/RV homes, and 41 multifamily homes.

The 2015 to 2019 American Community Survey 5-Year Estimate shows there are 107 households in the city of Wimbledon resulting in an average household size of 1.85 people.

### **Businesses**

Major employers in the city of Wimbledon include Agroline, Arrowwood Prairie Coop, Cenex, and the grocery store/café. Additional information on businesses and economic development in the city of Wimbledon or can be obtained by contacting the Valley City-Barnes County Development Group.

### **New and Future Development**

New development is considered any development occurring since the 2015 Barnes County Multi-Hazard Mitigation Plan. Future development is considered any development that is planned, pending, or proposed. The following is a list of new and future development for the city of Wimbledon.

#### New

- Old bank building was converted into a waterfowl guide service center with lodging (three rooms up to 14 people)
- Two new homes moved into the city (one duplex from Fargo and was split into two separate homes)
- A fourplex apartment building was converted back into a single-family home
- The former city hall/community center which served as a storm shelter was torn down

#### Future

- Plans for expanding the fire hall and including space for a community hall/city hall.

### **Buildings, Critical Facilities and Infrastructure, and Services and Utilities Provided**

The following section profiles the housing units, services, emergency response services, jurisdictional buildings, and utilities of the city of Wimbledon. Tables 3.10 to 3.13 in Chapter 3, Profile and Inventory show a complete inventory of this information for Barnes County and incorporated jurisdictions. An “X” indicates if the jurisdiction offers the utility or service (either through contract or employees) or possesses the building or resource. Narratives detailing information for the county and incorporated jurisdictions accompany each table.

Structures. Housing units show where populations are located. Table 3.9 in Chapter 3, Profile and Inventory shows the number of single-family, mobile home structures, and multifamily and in Barnes County and incorporated jurisdictions. The following are key points for the city of Wimbledon:

- There are 100 single-family housing units comprising 68.5 percent of all housing units in the city of Wimbledon.
- There are five Mobile/Boat/RV/Van homes comprising 3.4 percent of all housing units in the city of Wimbledon
- There are 41 Multifamily housing units comprising 28.1 percent of all housing units in the city of Wimbledon.
- According to the city of Wimbledon, there is an eightplex, one fourplex, and one apartment building with ten units.

Critical Facilities. The following facilities were identified as critical in the city of Wimbledon.

- American Legion
- Wimbledon City Hall/Community Center (also serves as a storm shelter)
- Wimbledon City Shop
- Wimbledon Fire Hall
- U.S. Post Office

Infrastructure. The following infrastructure was identified as critical in the city of Wimbledon.

- The city of Wimbledon does not maintain an inert landfill, but tree branch debris is disposed on the northeast side of the city behind the water tower.
- The city of Wimbledon has a sanitary sewer system with two lagoon cells and a five lift stations. Three lift stations are for the sanitary sewer system and are located on the north side of town, west side of town and at the lagoon. Two lift stations are for the storm water system and are located on the northeast and southeast corner of town. There are no septic systems in the city of Wimbledon.
- The city is of Wimbledon is located on N.D. Highway 9.

Emergency Response Services. The following emergency response services were identified in the city of Wimbledon.

- Barnes County Ambulance and Jamestown Area Ambulance provide ambulance services to the city of Wimbledon.
- The Wimbledon Fire Department provide fire protection to the city and surrounding area.
- The Barnes County Sherriff's Office provides law enforcement services to the city of Wimbledon.
- Wimbledon has a quick response unit with six members.
- The city has 23 first responders – four QRU, 17 firefighters, and two fire/QRU.
- The nearest hospital is Jamestown Regional Medical Center in Jamestown.
- City-County Health District is in the city of Valley City and provides public health services to the city of Wimbledon.

Services and Utilities. The following services are provided in the city of Wimbledon.

- Central Dakota Sanitation provides garbage collection services to the city of Wimbledon.

- The city of Wimbledon does not maintain an inert landfill, but tree branch debris is disposed on the northeast side of the city behind the water tower.
- The city of Wimbledon has a sanitary sewer system with two lagoon cells and a five lift stations. Three lift stations are for the sanitary sewer system and are located on the north side of town, west side of town and at the lagoon. Two lift stations are for the storm water system and are located on the northeast and southeast corner of town. There are no septic systems in the city of Wimbledon.
- The city has a storm water system consisting of drainage ditches.
- The Wimbledon Newsletter is the official newspaper of the city of Wimbledon.
- Barnes Rural Water District provides drinking/potable water to the city of Wimbledon.
- Electricity is provided by Otter Tail Power.
- Natural gas is not available in the city of Wimbledon.
- Fuel oil, propane, and electricity are used as an alternative heating source and is provided by companies chosen by the individual consumer.
- Daktel and Midcontinent provide phone and internet.

### 8.13.2 Risk Assessment and Hazard Scoring Notes

Table 8.13.2 summarizes the risk assessment scoring of the city of Wimbledon. The risk assessment and hazard scoring notes for each hazard specific to the city are shown in Table 8.13.3. Risk assessment notes for impact, frequency, likelihood and vulnerability ubiquitous for jurisdictions in Barnes County are found in Chapter 4, Threat and Hazard Identification Assessment in each respective hazard profile.

**Table 8.13.2 – City of Wimbledon Jurisdiction Risk Assessment Scoring Summary**

<b>Risk Assessment</b>							<b>Jurisdiction: City of Wimbledon</b>						
<b><u>Natural Hazard</u></b>	<b><u>Impact</u></b>	<b><u>Frequency</u></b>	<b><u>Likelihood</u></b>	<b><u>Vulnerability</u></b>	<b><u>Capabilities</u></b>	<b><u>Total</u></b>							
Drought	4	3	3	4	2	<b>12</b>							
Fire – Urban/Structure Collapse	4	2	3	3	3	<b>9</b>							
Fire – Wildland (Rural)	4	3	2	2	3	<b>8</b>							
Flood	2	3	3	2	2	<b>8</b>							
Geologic Hazard	NA	NA	NA	NA	NA	<b>NA</b>							
Infectious Disease	4	2	3	2	2	<b>9</b>							
Severe Summer Weather	3	3	3	3	2	<b>10</b>							
Severe Winter Weather	4	4	4	3	2	<b>13</b>							
Space Weather	4	1	2	3	1	<b>9</b>							
<b><u>Adversarial Threats</u></b>													
Civil Disturbance	4	2	2	4	1	<b>11</b>							
Criminal, Terrorist or Nation-State Attack	4	2	2	4	1	<b>11</b>							
Cyberattack	4	1	2	3	1	<b>9</b>							
<b><u>Technological Threats</u></b>													
Dam Failure	NA	NA	NA	NA	NA	<b>NA</b>							
Hazardous Material Release	4	2	4	4	2	<b>12</b>							
Transportation Incident	4	3	4	4	2	<b>13</b>							

(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Table 8.13.3 – City of Wimbledon Jurisdiction Risk Assessment

	<b>Civil Disturbance</b>	
<b>Impact</b>	<ul style="list-style-type: none"> <li>Blocked Roads</li> <li>Business Interruptions</li> <li>Delayed Emergency Response</li> <li>Financial Hardship/Strain (public)</li> </ul>	<ul style="list-style-type: none"> <li>HAZMAT Release – oil trains and natural gas pipeline</li> <li>Human Injury/Death</li> <li>Property Damage (Structure)</li> <li>Property Damage (Vehicle)</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>Never an occurrence of a major incident</li> </ul>	<ul style="list-style-type: none"> <li>DAPL protesters were not active in the city</li> </ul>
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> <li>Presence of railroad infrastructure</li> <li>Presence of public school</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No pipelines</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Lack of local active/continuous law enforcement coverage</li> <li>Presence of railroad infrastructure</li> <li>Presence of public school</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>Small town with no major regional/state attractions</li> <li>Sparse population</li> <li>No pipelines</li> </ul>



Table 8.13.3 – City of Wimbledon Jurisdiction Risk Assessment – Continued

Criminal, Terrorist, Nation-State Attack			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> <li>• Human Injury/Death</li> <li>• Property Damage (Structure)</li> <li>• Property Damage (Vehicle)</li> </ul> <ul style="list-style-type: none"> <li>• <b>Threats to city water supply</b></li> <li>• Mass Casualties/Fatalities</li> <li>• Loss of Communication Systems</li> <li>• Disease Outbreak/Mass Infections</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No occurrences</li> <li>• Miscellaneous property damage occurring in the city on an occasional basis</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>
<u>More Likely</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>
<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of local active/continuous law enforcement coverage</li> <li>• Presence of railroad infrastructure</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with no major regional/state attractions</li> <li>• Sparse population</li> <li>• No pipelines</li> </ul>		

Table 8.13.3 – City of Wimbledon Jurisdiction Risk Assessment – Continued

Cyberattack			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Business Interruptions</li> <li>• Delayed Emergency Response</li> <li>• Financial Hardship/Strain (public)</li> <li>• HAZMAT Release</li> <li>• Human Injury/Death</li> <li>• School Closure</li> <li>• <b>Loss of Communication Systems</b></li> <li>• Identity Theft – loss of wages and/or assets</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never an occurrence of a major attack</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Presence of railroad infrastructure</li> <li>• Presence of public school</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Presence of railroad infrastructure</li> <li>• Presence of public school</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No pipelines</li> </ul>
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<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Elderly population relying largely on landlines for communication purposes, remote medical care and equipment monitoring</li> <li>• Presence of railroad infrastructure</li> <li>• Presence of public school</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No pipelines</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Small town with lack of technological infrastructure to defend against cyber attacks</li> <li>• Elderly population relying largely on landlines for communication purposes, remote medical care and equipment monitoring</li> <li>• Presence of railroad infrastructure</li> <li>• Presence of public school</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Lack of major financial institutions or communication infrastructure</li> <li>• No pipelines</li> </ul>
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Table 8.13.3 – City of Wimbledon Jurisdiction Risk Assessment - Continued

		Drought	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Loss of Economy</li> <li>• Loss of Livestock</li> <li>• Loss of Wildlife Habitat (decreased wildlife populations)</li> <li>• Increase in Wildland Fire Potential</li> </ul>	<ul style="list-style-type: none"> <li>• Water quality compromised from stock dams</li> <li>• Diminished soil quality – salinity will increase</li> <li>• Negative impact on mental health of producers and fire responders – “community impact”</li> <li>• Local producers forced to sell off herds which can last for several years</li> <li>• Population loss as people moved away due to loss of economy</li> </ul>	
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Severe Drought of 1961/1962, 1988/1989 to 1991/1992</li> <li>• Summer of 2017, local producers forced to sell off portions of their herds</li> </ul>	<ul style="list-style-type: none"> <li>• End of July through winter of 2016 – county reached severe drought status</li> <li>• Severe drought in summer/fall of 2020</li> </ul>	
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Dry/wet cycle every five to eight years</li> <li>• Climatic patterns will result in an eventual drought of significance</li> <li>• Lack of precipitation</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Heavy precipitation</li> </ul>	
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Wildlife &amp; hunting economy</li> <li>• Agriculture economy</li> <li>• Elderly population</li> <li>• Flat terrain/open topography contributes to conditions</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• City does not have a fire index sign</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Financial assistance programs made available by the state and federal government</li> <li>• Burn Ban by county emergency management</li> <li>• Fire Index monitoring and mapping from NDDDES</li> <li>• Advanced communications such as internet and TV</li> <li>• 10,000 gallon holding tank for back up water supply at the water plant</li> <li>• City has a water tower</li> <li>• Barnes Rural Water District</li> </ul>	

Table 8.13.3 – City of Wimbledon Jurisdiction Risk Assessment - Continued

Fire – Urban Fire/Structure Collapse			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• HAZMAT Release</li> </ul> <ul style="list-style-type: none"> <li>• Human Injury/Death</li> <li>• Increase Fire Potential</li> <li>• Property damage on a significant scale if impacting downtown structures</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Occurrences of structures/vehicles being impacted every five years</li> <li>• Structural fire, lost single-family home last fall 2013</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Age of structures on main street</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• Railroad infrastructure traversing city limits</li> <li>• Lack of building codes and enforcement</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Age of structures on main street</li> <li>• Increased use of electric heaters</li> <li>• Outdated electric wiring in older homes and structures</li> <li>• Outdated heating systems</li> <li>• Railroad infrastructure traversing city limits</li> <li>• Lack of building codes and enforcement</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Better building standards and maintenance of structures</li> <li>• Smoke detectors in public buildings and private homes/businesses</li> <li>• Well-equipped fire department with trained volunteers</li> </ul>
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Table 8.13.3 – City of Wimbledon Jurisdiction Risk Assessment – Continued

Fire – Rural & Wildland			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Building Collapse</li> <li>• Crop Loss</li> <li>• Delayed Emergency Response</li> <li>• Evacuation (Localized)</li> <li>• Explosion</li> <li>• Increase Fire Potential</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Mass Casualties</li> <li>• <b>Losses could be on a significant scale if impacting a major producer or farmstead</b></li> <li>• <b>Loss of farm equipment and assets</b></li> <li>• <b>Loss of Livestock</b></li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Controlled burns becoming out of control approximately 25 percent of the time</li> <li>• Farmers do much control burning, very slim chance of becoming uncontrollable</li> <li>• No reports of lightning impacting grasslands</li> <li>• Railroad and hot bearings have started</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> <li>• Railroad infrastructure traversing through city limits</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Agricultural burn-off</li> <li>• High winds annually and dry conditions – when present</li> <li>• Pastureland adjacent to structures and city limits</li> <li>• Severe summer weather with significant lightning</li> <li>• Railroad infrastructure traversing through city limits</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Removal of CRP near city limits</li> <li>• Summer and winter weather with heavy precipitation</li> </ul>
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Table 8.13.3 – City of Wimbledon Jurisdiction Risk Assessment – Continued

Flood	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• <b>Blocked Roads:</b> three of four corners at intersection of 3<sup>rd</sup> Avenue and Center St., and at pump/lift stations.</li> <li>• Delayed Emergency Response</li> <li>• Flooding (Highway &amp; Structure)</li> <li>• Human Injury/Death</li> <li>• Property Damage / Sewer Backup</li> <li>• <b>Runoff from buildings causes overland flooding</b></li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Only happens with a lot of precipitation or snow in the winter</li> <li>• Depends largely on the weather</li> <li>• Sump pumps are constantly running</li> <li>• High water table</li> </ul> <ul style="list-style-type: none"> <li>• Flash flooding occurs from heavy precipitation</li> </ul>
<b>Likelihood</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> </ul> </div> <div style="width: 45%;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Dry seasons and low precipitation</li> <li>• City performs storm water drainage maintenance</li> </ul> </div> </div>
<b>Vulnerability</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Rapid change of seasons resulting in excessive snow melt</li> <li>• High water table</li> <li>• Local topography of the city with closed basins</li> <li>• City does not have flood ordinances</li> <li>• Inadequate storm water drainage system</li> </ul> </div> <div style="width: 45%;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Alternate routes were identified for townships roads</li> <li>• City performs storm water drainage maintenance</li> <li>• City enrolled in NFIP</li> </ul> </div> </div>

Table 8.13.3 – City of Wimbledon Jurisdiction Risk Assessment – Continued

Geologic Hazard			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Delayed Emergency Response</li> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> <li>• Loss of Power</li> <li>• Property Damage</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• No incidents involving geologic hazards in or near city limits</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• All North Dakota counties are in EPA Radon Zone 1</li> <li>• Drought and periods of heavy precipitation exacerbate expansive/unstable soils</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• No Abandoned Mine Lands located near city limits</li> <li>• No expansive or shifting soils</li> <li>• PSC has an AML reclamation project aimed at recovering AMLs – work has been done</li> </ul>
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Table 8.13.3 – City of Wimbledon Jurisdiction Risk Assessment – Continued

Hazardous Material Release			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Blocked Roads</li> <li>• Delayed Emergency Response / Increased Fire Potential</li> <li>• Environmental Degradation</li> <li>• Evacuation (localized)</li> <li>• Explosion</li> <li>• Human Injury/Death</li> <li>• Loss of Economy</li> <li>• Loss of Potable Water</li> <li>• Loss of Power</li> <li>• Property Damage</li> <li>• Increased risk of HAZMAT release and/or transportation incidents due to increased oil train traffic and trucks</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Small incidents of leaking anhydrous tanks bi-annually</li> <li>• Never any major spills reported</li> <li>• Never a pipeline leak</li> </ul>		
<b>Likelihood</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Likely</u> <ul style="list-style-type: none"> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines nearby</li> <li>• Railroad infrastructure traversing through city limits</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Likely</u> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> <li>• Decrease in oil trains (from a frequency of one per hour) one the DAPL opened in 2017</li> </ul> </td> </tr> </table>	<u>More Likely</u> <ul style="list-style-type: none"> <li>• Transportation of chemicals by truck through city limits</li> <li>• Storage of chemicals/fertilizers in city limits and on farmsteads in large tanks near city limits</li> <li>• Presence of energy pipelines nearby</li> <li>• Railroad infrastructure traversing through city limits</li> </ul>	<u>Less Likely</u> <ul style="list-style-type: none"> <li>• Private companies have HAZMAT certifications</li> <li>• Decrease in oil trains (from a frequency of one per hour) one the DAPL opened in 2017</li> </ul>
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Table 8.13.3 – City of Wimbledon Jurisdiction Risk Assessment – Continued

Infectious Disease	
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Crop Loss</li> <li>• Human Injury/Death</li> <li>• Livestock Loss</li> <li>• Loss of Economy</li> <li>• Mass Casualties</li> </ul> <ul style="list-style-type: none"> <li>• Strain on local medical resources (ambulance)</li> <li>• Loss of medical staff due to sickness</li> <li>• Loss of Potable Water</li> <li>• Financial cost to public health resources</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Annual occurrences of death, primarily among the elderly</li> <li>• Occurrence of disease - 1 in 3 for people annually</li> <li>• Annual occurrences of influenza cases in the local population</li> </ul> <ul style="list-style-type: none"> <li>• <b>The COVID-19 Pandemic of 2020 resulted in mass quarantine and sheltering of the local population and temporary closure of businesses</b></li> </ul>
<b>Likelihood</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• Dependent on weather for animals and crops</li> <li>• Transporting of animals across state lines</li> </ul> </div> <div style="width: 45%;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> </ul> </div> </div>
<b>Vulnerability</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Growing elderly population</li> <li>• Small population of children without immunization</li> <li>• Agriculture economy</li> <li>• Transporting of animals across state lines</li> <li>• No hospital or medical clinic</li> <li>• No vet clinic in city limits</li> <li>• Presence of a public school</li> <li>• Presence of abandoned buildings</li> </ul> </div> <div style="width: 45%;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced communications such as internet and tv</li> <li>• Public health and employment regulations for public facilities</li> <li>• Immunizations &amp; medications of local population</li> <li>• No care center in the city</li> <li>• Mowing of city lots and spray for mosquitos</li> </ul> </div> </div>

Table 8.13.3 – City of Wimbledon Jurisdiction Risk Assessment – Continued

Severe Summer Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• <b>Blocked Roads:</b> three of four corners at intersection of 3<sup>rd</sup> Avenue and Center St., and at pump/lift stations.</li> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – heat exhaustion</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> </ul> <ul style="list-style-type: none"> <li>• Vehicle Damage</li> <li>• Loss of Livestock</li> <li>• Loss of Crops</li> <li>• Loss of Power/Downed Power Lines -</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Property damage from tornados/straight-line winds in summer 2017 and 2019</li> <li>• Windstorms occurring annually</li> </ul> <ul style="list-style-type: none"> <li>• Annual occurrences of hailstorms</li> <li>• Two or three significant storms producing damage to trees and property annually</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at community center, fire hall, and lift station</li> <li>• Lack of building codes and enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of adequate storm water drainage system</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> <li>• City has a portable generator</li> </ul> </td> </tr> </table>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at community center, fire hall, and lift station</li> <li>• Lack of building codes and enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of adequate storm water drainage system</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> <li>• City has a portable generator</li> </ul>
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Table 8.13.3 – City of Wimbledon Jurisdiction Risk Assessment – Continued

Severe Winter Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• <b>Blocked Roads:</b> three of four corners at intersection of 3<sup>rd</sup> Avenue and Center St., and at pump/lift stations.</li> <li>• Evacuation (Localized)</li> <li>• Human Injury/Death – wind chill</li> <li>• Property Damage – repair of roofing, siding and drainage systems for homes</li> </ul> <ul style="list-style-type: none"> <li>• Loss of Crops</li> <li>• Loss of Livestock</li> <li>• Loss of Power/Downed Power Lines</li> <li>• Sewer Backup</li> <li>• Shelter-in-place</li> <li>• Vehicle Damage</li> <li>• Infrastructure Degradation</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• March 2017 snowstorm resulted in blocked roads throughout the city</li> <li>• Spring snowstorm of 2019</li> <li>• Annual occurrences of power loss from storms</li> <li>• Two or three significant blizzards producing damage to trees and property annually</li> </ul> <ul style="list-style-type: none"> <li>• Happens yearly, weather and climate in the area</li> <li>• High winds and ground blizzard conditions</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Climatic patterns will result in numerous annual occurrences of the hazard</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at community center, fire hall and lift station</li> <li>• Lack of building codes and enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of adequate storm water drainage system</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> <li>• City has access to a portable generator</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at community center, fire hall and lift station</li> <li>• Lack of building codes and enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of adequate storm water drainage system</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> <li>• City has access to a portable generator</li> </ul>
<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• High elderly population</li> <li>• Presence of mobile homes</li> <li>• Aging infrastructure (roads and electrical systems)</li> <li>• Lack of permanent generator at community center, fire hall and lift station</li> <li>• Lack of building codes and enforcement</li> <li>• Manual-activated emergency siren</li> <li>• Railroad infrastructure traversing through city limits</li> <li>• Lack of adequate storm water drainage system</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Advanced warning and notification such as internet and TV</li> <li>• Manual-activated emergency siren</li> <li>• No public school</li> <li>• City has access to a portable generator</li> </ul>		

Table 8.13.3 – City of Wimbledon Jurisdiction Risk Assessment – Continued

Space Weather			
<b>Impact</b>	<ul style="list-style-type: none"> <li>• Loss of operation of the community center, fire hall, lift station, etc.</li> <li>• Loss/outage of medical devices at private residences</li> <li>• Property damage from sewer backups due to loss of lift station</li> </ul>		
<b>Frequency</b>	<ul style="list-style-type: none"> <li>• Never a recorded occurrence in Barnes County or North Dakota</li> </ul>		
<b>Likelihood</b>	<ul style="list-style-type: none"> <li>• Dependent on solar activity and the 11-year solar cycle</li> <li>• Likely to occur once every 500 years per the 2018 N.D. Enhanced Mitigation MAOP</li> </ul>		
<b>Vulnerability</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> <li>• Lack of permanent generator at community center, fire hall and lift station</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> </ul> </td> </tr> </table>	<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> <li>• Lack of permanent generator at community center, fire hall and lift station</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> </ul>
<u>More Vulnerable</u> <ul style="list-style-type: none"> <li>• Agriculture economy</li> <li>• All critical facilities and infrastructure that require electricity for operation</li> <li>• Advanced communication systems (internet, TV, etc.)</li> <li>• Lack of permanent generator at community center, fire hall and lift station</li> </ul>	<u>Less Vulnerable</u> <ul style="list-style-type: none"> <li>• Local food production/households with gardens</li> </ul>		

Table 8.13.3 – City of Wimbledon Jurisdiction Risk Assessment – Continued

	<b>Transportation Incident</b>	
<b>Impact</b>	<ul style="list-style-type: none"> <li>Blocked roads from inadequate road clearing</li> <li>Human Injury/Death</li> <li>Increased Fire Potential</li> <li>Loss of Transportation/Accessibility</li> <li>Mass Casualties/Fatalities</li> </ul>	<ul style="list-style-type: none"> <li>Delayed Emergency Response</li> <li>HAZMAT Release</li> <li>Livestock Loss</li> <li>Business Interruptions</li> <li>Property Damage</li> <li>Could be catastrophic if involving a school bus filled with children and a truck carrying hazardous materials</li> </ul>
<b>Frequency</b>	<ul style="list-style-type: none"> <li>Annual occurrences of accidents involving cars and/or farm equipment</li> </ul>	<ul style="list-style-type: none"> <li>Three motorcycles and a pickup crashed summer 2013</li> <li>Alcohol-related accidents occur every few years</li> </ul>
<b>Likelihood</b>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> <li>Intoxicated drivers</li> <li>High truck traffic from agriculture-related traffic</li> <li>Railroad infrastructure traversing through city limits</li> </ul>	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> <li>No commercial passenger airport</li> <li>Decrease in oil trains (from a frequency of one per hour) one the DAPL opened in 2017</li> </ul>
<b>Vulnerability</b>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> <li>Intoxicated drivers</li> <li>High truck traffic from agriculture-related traffic</li> <li>No hospital or medical clinic</li> <li>Railroad infrastructure traversing through city limits</li> <li>Lack of paved streets</li> <li>Lack of street signage, crosswalks, and sidewalks</li> </ul>	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> <li>No commercial passenger airport</li> <li>Presence of designated truck routes through city limits</li> </ul>

### 8.13.3 Mitigation Strategy

The Barnes County Multi-Jurisdictional Multi-Hazard Plan Update includes a mitigation strategy consisting of seven goals in Chapter 6. The following problem statement and mitigation projects address the mitigation needs of the city of Wimbledon. It should be noted that some mitigation projects that pertain to all jurisdictions are included to encourage county-wide collaboration.

#### **Problem Statement**

The lack of a property storm water drainage system causes overland flooding from severe summer weather and severe winter weather events. The city's outdoor emergency alerting system is manually activated. Windstorms are frequent in the area, which block roads due to snow drifts and various debris, and cause power outages. The Wimbledon Fire Hall, community center, water tower, and lift stations lack permanent sources of backup power. The city lacks a proper storm shelter. With little to no additional capabilities, the city is dependent on outside sources for mitigation.

Improved drainage, installation of generators at critical facilities and infrastructure, upgrading of the outdoor early warning system, and a storm shelter are a priority for the city.

**City of Wimbledon Project 1: Conduct engineering study to identify solutions to update/retrofit storm water drainage system.**

Description/Benefit	<p>Poor drainage in the following areas of the city: three of four corners at intersection of 3<sup>rd</sup> Avenue and Center St., and at pump/lift stations.</p> <p>Reduction of damage to critical facilities and infrastructure from annual flooding to assure access for emergency services and continued operation of public infrastructure. Reduce or eliminate damage to people's homes. Maintain flow of runoff to eliminate standing water blocking roads to maintain access for city residents and emergency services and continued operation of public infrastructure.</p>						
Hazards Addressed	Flood, Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	City of Wimbledon						
Project Status	New/Ongoing and Continue						
Priority	High						
Responsible Agency	City Council, Public Works						
Partners	County Commission, NDAC, NDLC, Regional Council, private contractors, SWC						
Completion Timeframe	2 to 3 years	Cost	Project-specific				
Funding Source	Local budgets. N.D. League of Cities. SWC.						
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	5	5	3	5	5	33
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			City solicits three engineering proposals from qualified firms. Select appropriate firm based on proposals. Apply for grant funding. Execute project. Submit reimbursements and close-out grant.		

**City of Wimbledon Project 2: Install permanent generators at critical facilities and infrastructure.**

Description/Benefit		Test existing generators and create regularly scheduled maintenance system. The city has a portable generator that is stored at Agroline. Install new generators to establish permanent source of backup power to maintain continued operation of the following critical facilities and infrastructure.					
		<u>Install New</u> <ul style="list-style-type: none"> <li>• Wimbledon Fire Hall</li> <li>• Lift stations</li> <li>• Community Center</li> <li>• Water tower</li> </ul>					
Hazards Addressed		All hazards					
Affected Jurisdiction(s)		City of Wimbledon					
Project Status		New					
Priority		High					
Responsible Agency		City Council, Emergency Services, Public Work					
Partners		Emergency Management, Public Utilities					
Completion Timeframe		2 to 3 years			Cost	Project-specific	
Funding Source		Public Utilities, Regional Council, RD. FEMA Pre-Disaster Mitigation Grant Program (PDM). State Homeland Security grants.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>			<u>Plan Element Utilized</u>			<u>Process for Integration</u>	
Barnes County LEOP & Mitigation Plan Barnes County THIRA			Capability Assessment, Hazard History, Risk Assessment			Include in city and/or fire department's budget. Apply for grant funding or purchase directly using existing sales tax revenue or budgets. Approval city council or board.	



**City of Wimbledon Project 3: Upgrade manually-activated outdoor emergency siren.**

Description/Benefit		The city’s outdoor emergency siren is manually activated and needs to be upgraded to provide radio-activation/dispatch-activation.					
Hazards Addressed		All					
Affected Jurisdiction(s)		City of Wimbledon					
Project Status		Ongoing and Continue					
Priority		Very High					
Responsible Agency		City Council, Emergency Services					
Partners		County Commission, Emergency Management, NDAC, NDLC, Regional Council					
Completion Timeframe		2 to 3 years	Cost	Up to \$25,000 per siren			
Funding Source		Local budgets. N.D. League of Cities. State Homeland Security Grants. NDDDES.					
<b>Values: 1 is low (negative impact and/or too costly) -- Value of 5 is high (positive impact/higher benefit compared to cost)</b>							
Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
5	5	4	5	5	5	5	34
<b>Integration of Mitigation Plan Requirements into Local Planning Mechanisms</b>							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Barnes County LEOP & Mitigation Plan Barnes County THIRA		Capability Assessment, Hazard History, Risk Assessment			Include in city and/or fire department’s capital improvement plan. Apply for grant funding or purchase directly using existing sales tax revenue or budgets. Approval city council or board.		

#### 8.13.4 Mitigation Capability Assessment

Capability for mitigation is divided into four categories: administrative and technical, education and outreach, financial, and planning and regulatory. Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. **Tables comparing the mitigation capabilities of the city of Wimbledon with all other jurisdictions in Barnes County can be found below and in Chapter 7, County Mitigation Capability Assessment.**

- Administrative and Technical: Identification of administrative and technical capabilities, which include staff, their skills and tools for mitigation planning to implement specific mitigation actions.
- Education and Outreach: Identification of education and outreach programs, and methods already in place to implement mitigation activities and communicate hazard-related information.
- Financial: Identification of access to or eligibility to use funding resources for hazard mitigation for jurisdictions.
- Planning and Regulatory: Jurisdictional plans, policies, codes, and ordinances adopted and in place that prevent and reduce the impacts of hazards.

#### City of Wimbledon Mitigation Capabilities

Each identified resource in the four categories can be used to implement mitigation strategies and access funding for projects. Information on the capabilities of the city was gathered at its jurisdictional meeting, committee meetings, and interviews during the planning process.

#### Administrative and Technical

The following narrative details the administrative and technical capabilities of the city of Wimbledon.

The city of Wimbledon has an active city council. The city does not have a chief building official or inspector. The county LEPC serves the city. The county emergency manager is the floodplain administrator/manager. The city is not flood mapped and the county emergency manager is the floodplain administrator/manager. Emergency management is available through the county. The city can contract with the SCDRC or a private firm for planning, grant writing and grant administration services. However, the auditor and mayor have grant writing and administration capabilities. The city conducts mowing of city and vacant lots with the cost special assessed to the lot owner. All other infrastructure maintenance programs are done on an as-needed basis. The city is part of the county-wide mutual aid agreement for emergency services. The city has an emergency siren located at the community center. The city owns one portable generator, which is stored at Agroline. The fire ISO rating for the city is eight. The city does not have a fire index sign. The fire responder vehicle is GPS capable, but all other emergency service are not GIS capable. The first responders use smart phones and are working with neighboring Stutsman County to get usable maps on the phones. It is unknown if hazard data is reported to the emergency manager. The city is not Firewise or StormReady Certified.

### **Education and Outreach**

The following narrative details the education and outreach capabilities of the city of Wimbledon.

The city does not have non-profit organizations providing education on hazards but has access to the NDSU/Barnes County Extension Service. The city does maintain a website with hazard education. A website with hazard education is also available through the county. There is not a school located in the city and therefore no school programs targeting hazard education are available. However, Barnes County North is located southeast of the city approximately eight miles where education and outreach is provided to students. Agroline and Cenex conducts hazard education for employees, but not the public. The city also has access to the NDSU/Barnes County Extension Service, Central Valley Health District and City-County Health for public education on hazards. The annual winter show held in Valley City and the Barnes County Air Show held every two years at the Barnes County Municipal Airport are events where outreach on hazard education is conducted. The city does not conduct events on hazard education. There are no public-private partnerships providing education and outreach on hazards. The county's emergency manager conducts education and outreach on hazards in the city.

### **Financial**

The following narrative details the financial capabilities of the city of Wimbledon.

The city does not set aside tax revenue for capital improvements and only has a general fund. The city does not have storm water utility fee as it lacks a storm water system. The city charges a monthly sanitary sewer fee of \$8, plus \$1.15 per thousand gallons of water on the water/sewer garbage bill. The city does not levy special assessments for new development but can do so if warranted. The city has not incurred any debt through general obligation bonds or special tax bonds, but also can do so if warranted. The city issues building permits. The city has access to CDBG funds through the SCDRC. The city does not have any private entities providing funding for mitigation. The surrounding township and county school districts are other sources of funding for mitigation.

### **Planning and Regulatory**

The following narrative details the planning and regulatory capabilities of the city of Wimbledon.

The city does not have a comprehensive, strategic, capital improvements, land use, storm water, water conservation or drought management plan. The city is included under the county's local emergency operations plan and flood management plan, and the county road department's transportation plan. The city does not have a continuity of operations plan. The city has zoning in place as of 2009. The city does not have impact fees but does have trailer park subdivision ordinances in place. The city issues building permits for development. The city council serves as the planning commission for the city. The city has not adopted state building codes and does not have an inspector. The city is not FEMA flood mapped and does not have flood ordinances. The city does not have a flood damage reduction study but does have a flood insurance study. The city is covered under the County's Pandemic Influenza Response Plan.

### **8.13.5 Integration of Mitigation Plan into Planning Mechanisms**

Integration of the plan into current planning mechanisms is critical in mitigation to communicate the needs of each jurisdiction to achieve an all-inclusive mitigation strategy. The process for integration of the mitigation plan is included after each mitigation project, which shows the planning mechanism utilized, the plan element used for integration and the process for integration.

### **8.13.6 Plan Maintenance**

An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the situation assessment, research, coordinating, disaster response or other activity is occurring. Plan maintenance ensures the plan will remain useful in the county for many years. A mitigation action progress report form to conduct plan maintenance is in Chapter 10 of this plan.

9. Maps

Maps provide visual illustrations of the geography of the Barnes County and assist in mitigation by providing details of the inventory of the county, where critical facilities and infrastructure are located, geographic coverage of emergency services, and each incorporated jurisdiction. Maps are drawings, depictions, and illustrations and are commonly referred to as figures in planning documents.

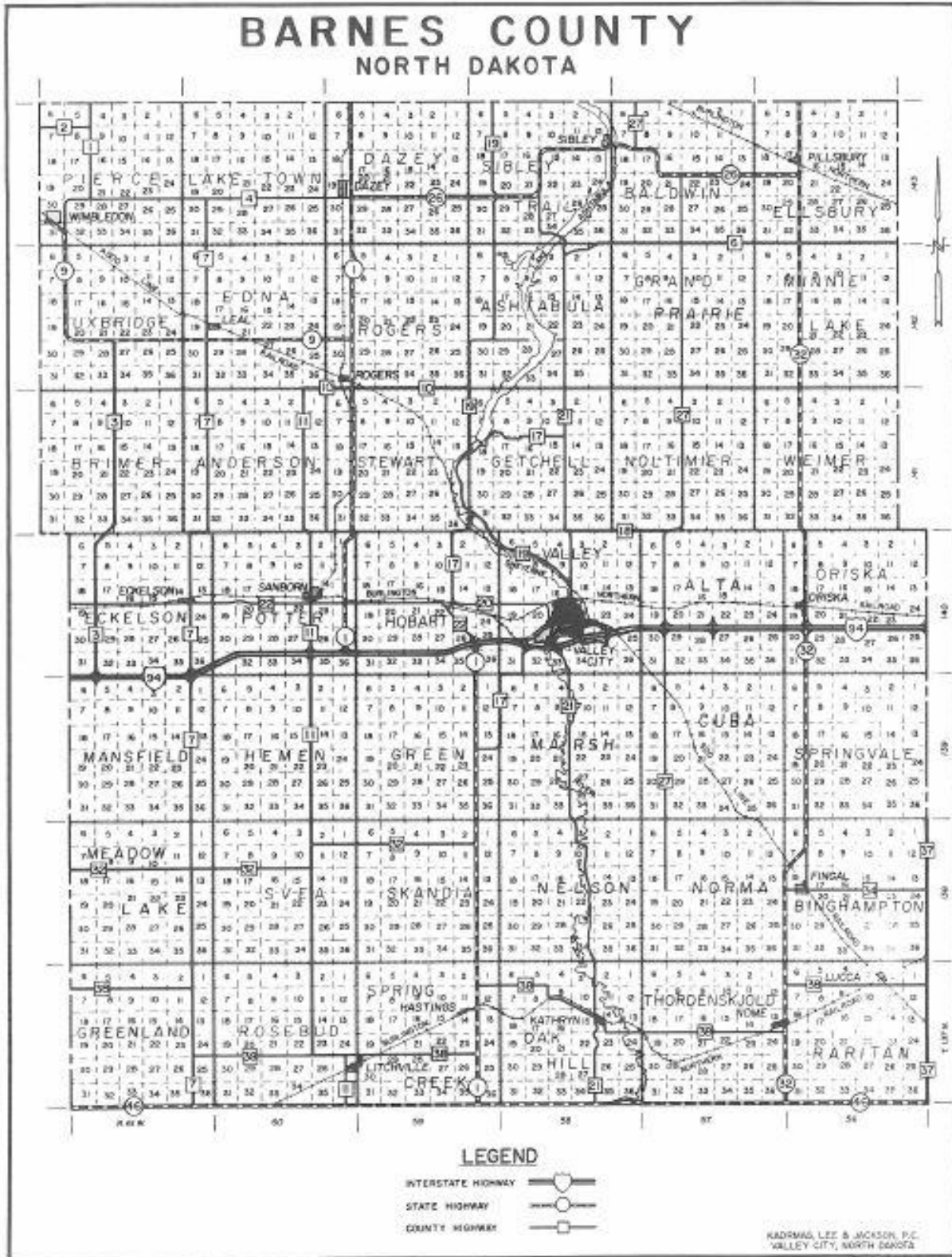
Figure 9.1 is of Barnes County and illustrates where each jurisdiction is located in reference to one another; national, state and county highways; railroads; and bodies of water and rivers. Information on the transportation system, including freight railroad, bridges and airports is important for understanding the transportation system and potential risk involved with transportation accidents, among other hazards.

Figure 9.1 – Barnes County, North Dakota



Source: North Dakota Geographic Information Systems

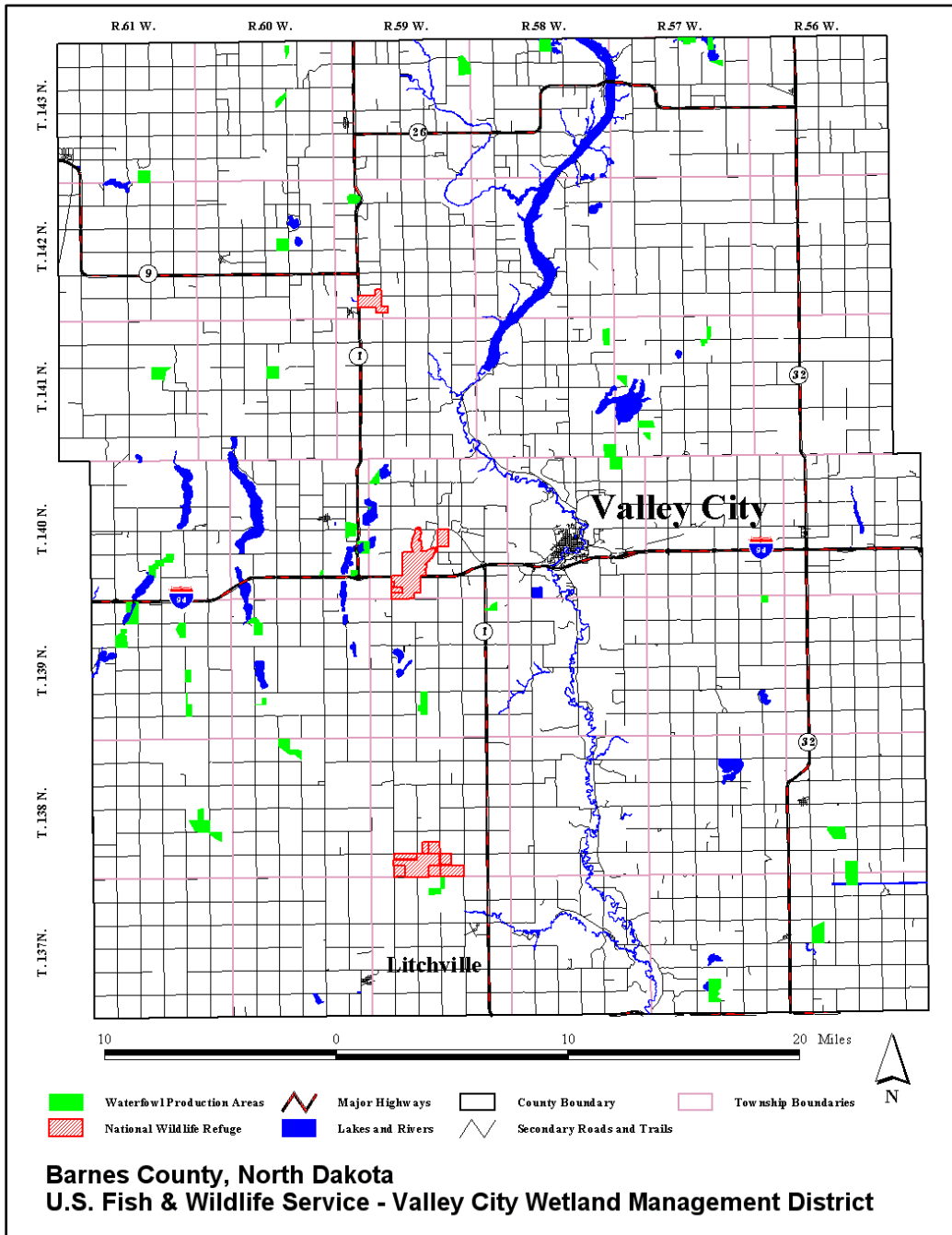
Figure 9.2 – Barnes County Townships



Source: Barnes County Auditor's Office

Figure 9.3 is a map of the waterfowl production areas (WPAs) in Barnes County under management of the Valley City Wetland Management District. These unique areas are key assets to the development, growth and sustainability of the tourism industry. They also limit some industrial development projects that could damage these areas and their missions. It is important to understand the extent and location of WPAs for mitigating hazard such as hazardous material release by restricting agriculture and industrial development in environmentally sensitive areas.

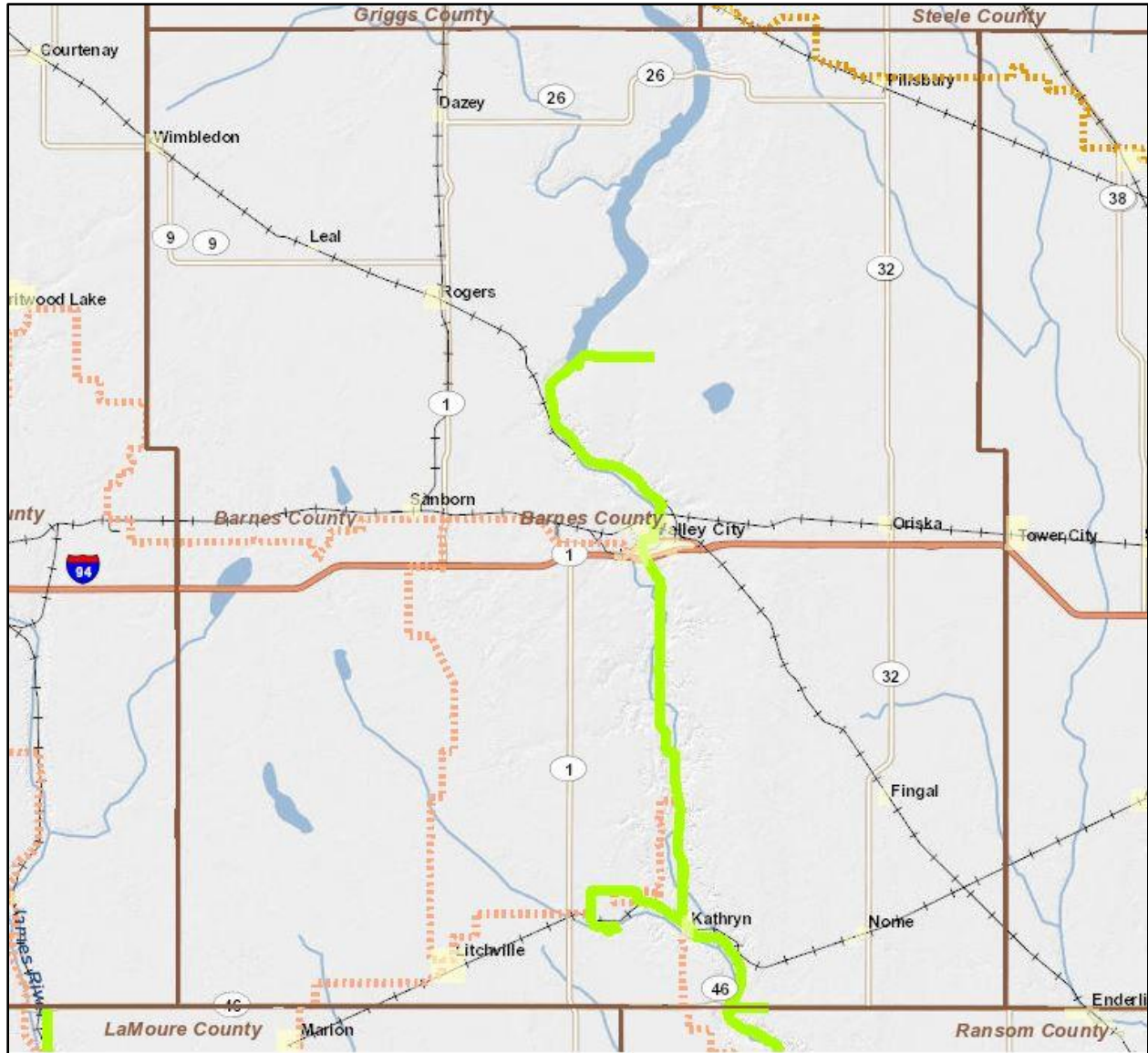
**Figure 9.3 – Barnes County Waterfowl Production and National Wildlife Refuges**



Sources: U.S. Fish & Wildlife Service, South Central Dakota Regional Council Comprehensive Economic Development Strategy

Figure 9.4 shows the location of the Sheyenne River Valley national Scenic Byway in Barnes County. The extent of the byway is highlighted in green. In addition, snowmobile routes are marked by the dashed orange and red lines.

**Figure 9.4 – Sheyenne River Valley National Scenic Byway**

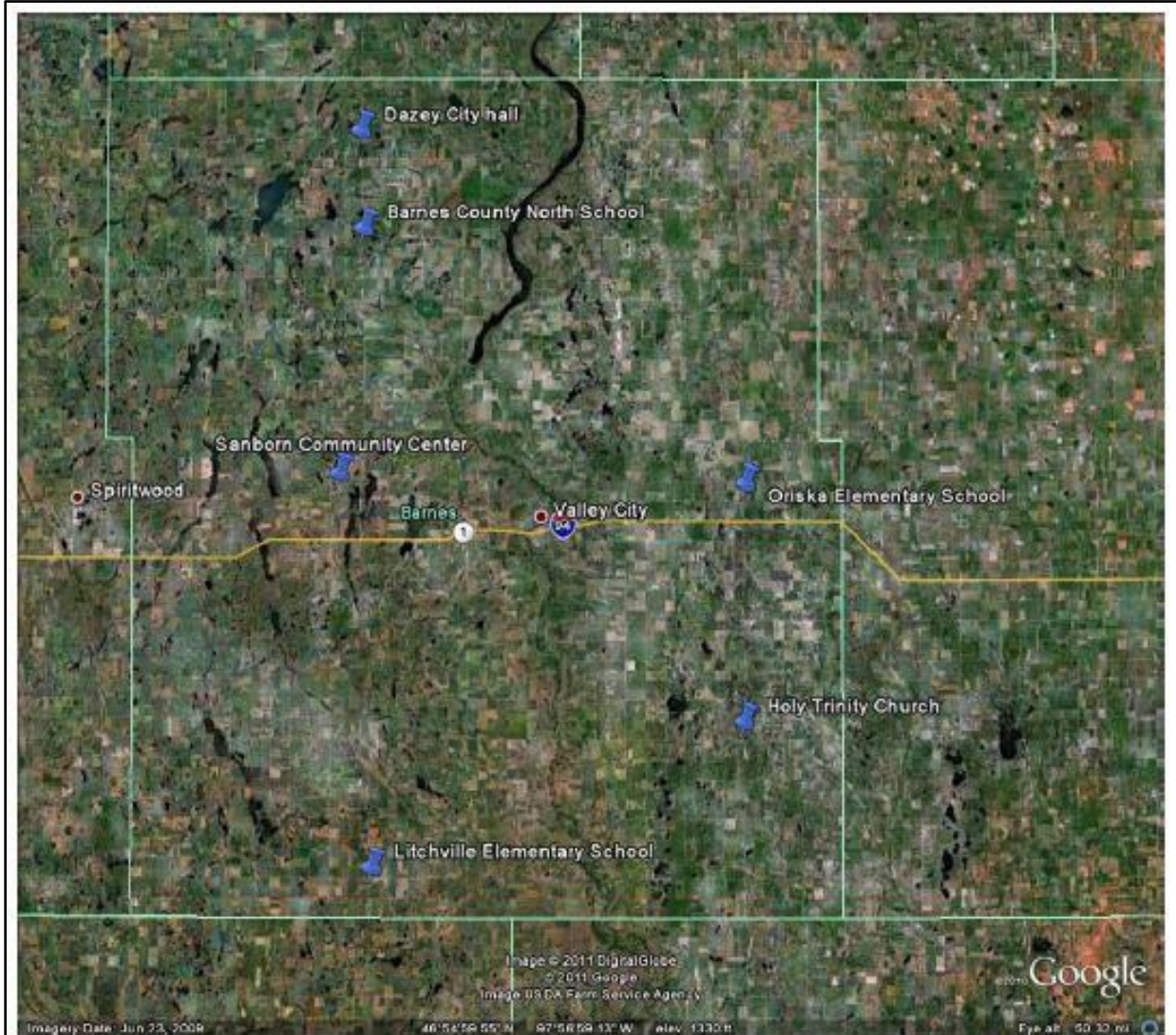


Source: North Dakota Geographic Information Systems



Figures 9.5 and 9.6 show the location of official storm shelters in Barnes County and Valley City. Understanding the locations of official storm shelters in the county is important for mitigation to eliminate or reduce loss of life or injury.

**Figure 9.5 – Barnes County Storm Shelter Locations**

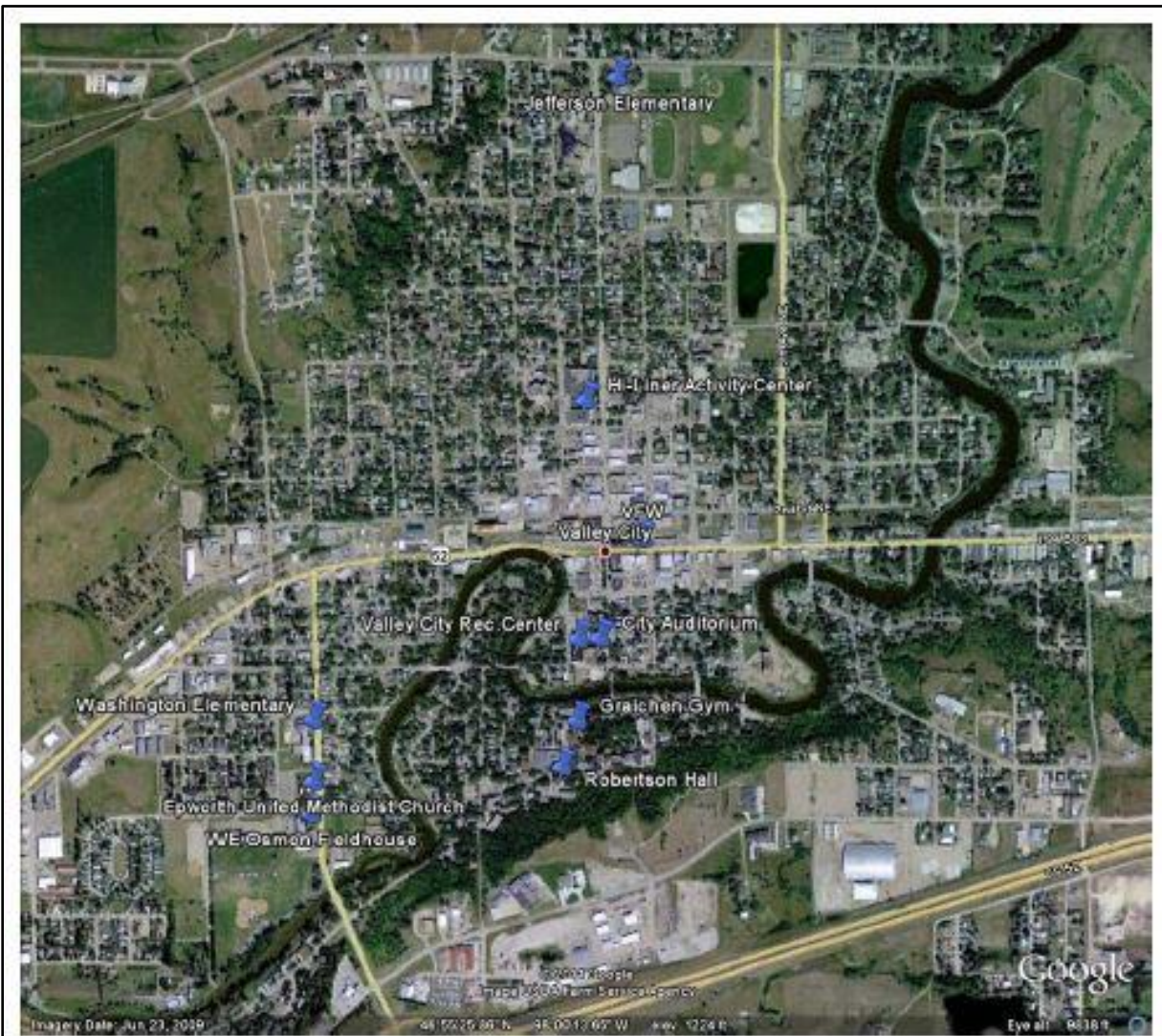


**Rural Barnes County Shelters:**

- Dazey City Hall, 1708 11 the Ave. SE, Dazey
- Barnes County North School, 10860 20 ½ St. SE, Rogers
- Sanborn Community Center, 603 5<sup>th</sup> Ave., Sanborn
- Oriska Elementary School, 502 2<sup>nd</sup> Ave., Oriska.....Capacity of 150
- Holy Trinity Church, 419 1<sup>st</sup> St., Fingal.....Capacity of 100
- Litchville Elementary, 304 6<sup>th</sup> Ave., Litchville.....Capacity of 250

Sources: Barnes County Emergency Operations Plan, Barnes County Emergency Management

Figure 9.6 – Valley City Storm Shelter Locations

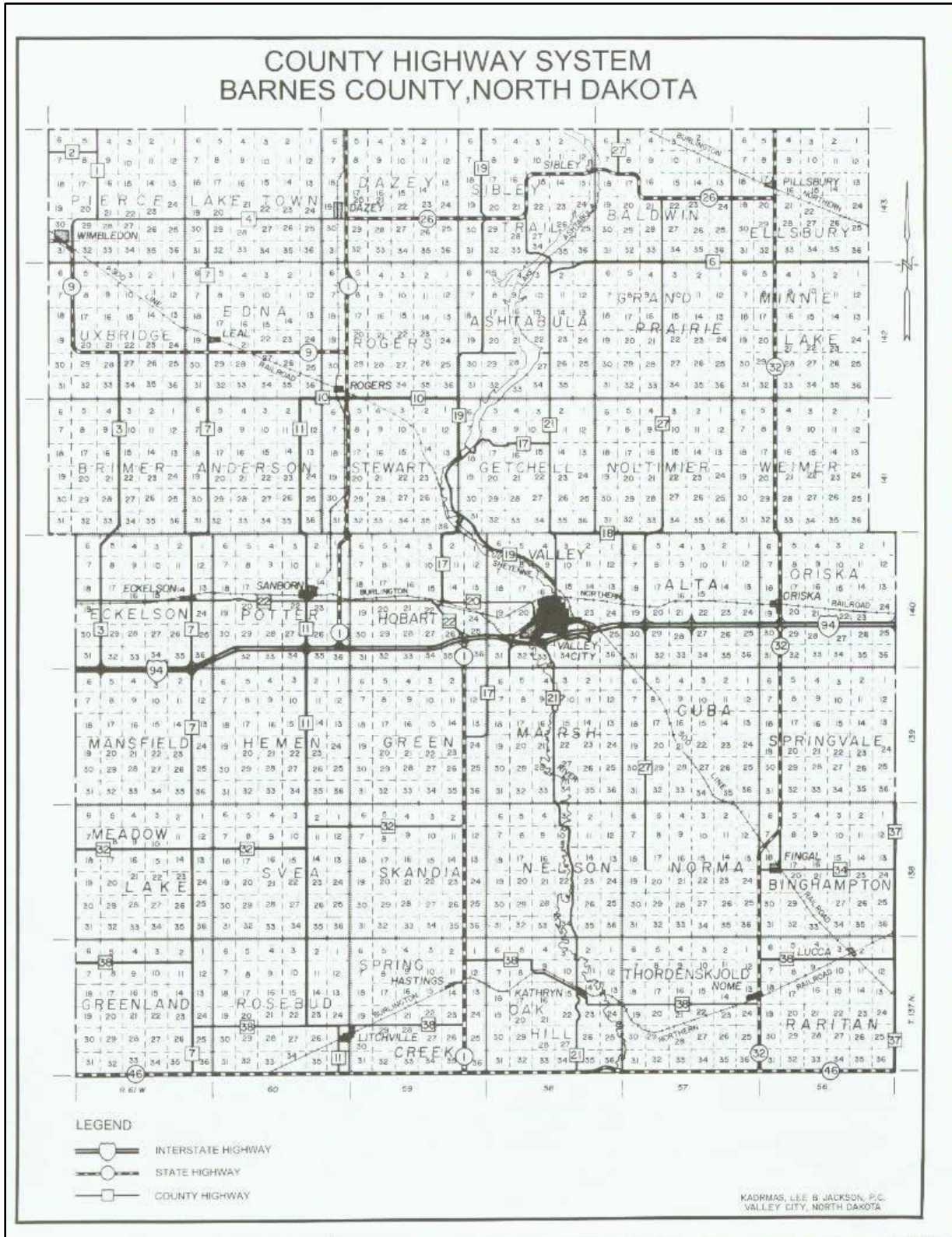


Valley City Shelters:

- Jefferson Elementary School, 1150 Central Ave. N
- Hi-Liner Activity Center, 460 Central Ave. N
- VFW, 138 East Main
- City Auditorium, 320 Central Ave. S.....Capacity of 500
- Valley City Rec. Center, 140 4<sup>th</sup> St. SW
- Graichen Gym, 155 College St. SW.....Capacity of 550
- Robertson Hall, 201 Viking Drive
- Washington Elementary School, 510 8<sup>th</sup> Ave. SW
- Epworth United Methodist Church, 680 8<sup>th</sup> Ave. SW.....Capacity of 150
- WE Osmon Fieldhouse, 730 8<sup>th</sup> Ave. SW.....Capacity of 2000

Sources: Barnes County Emergency Operations Plan, Barnes County Emergency Management

Figure 9.7 – Official Barnes County Highway System

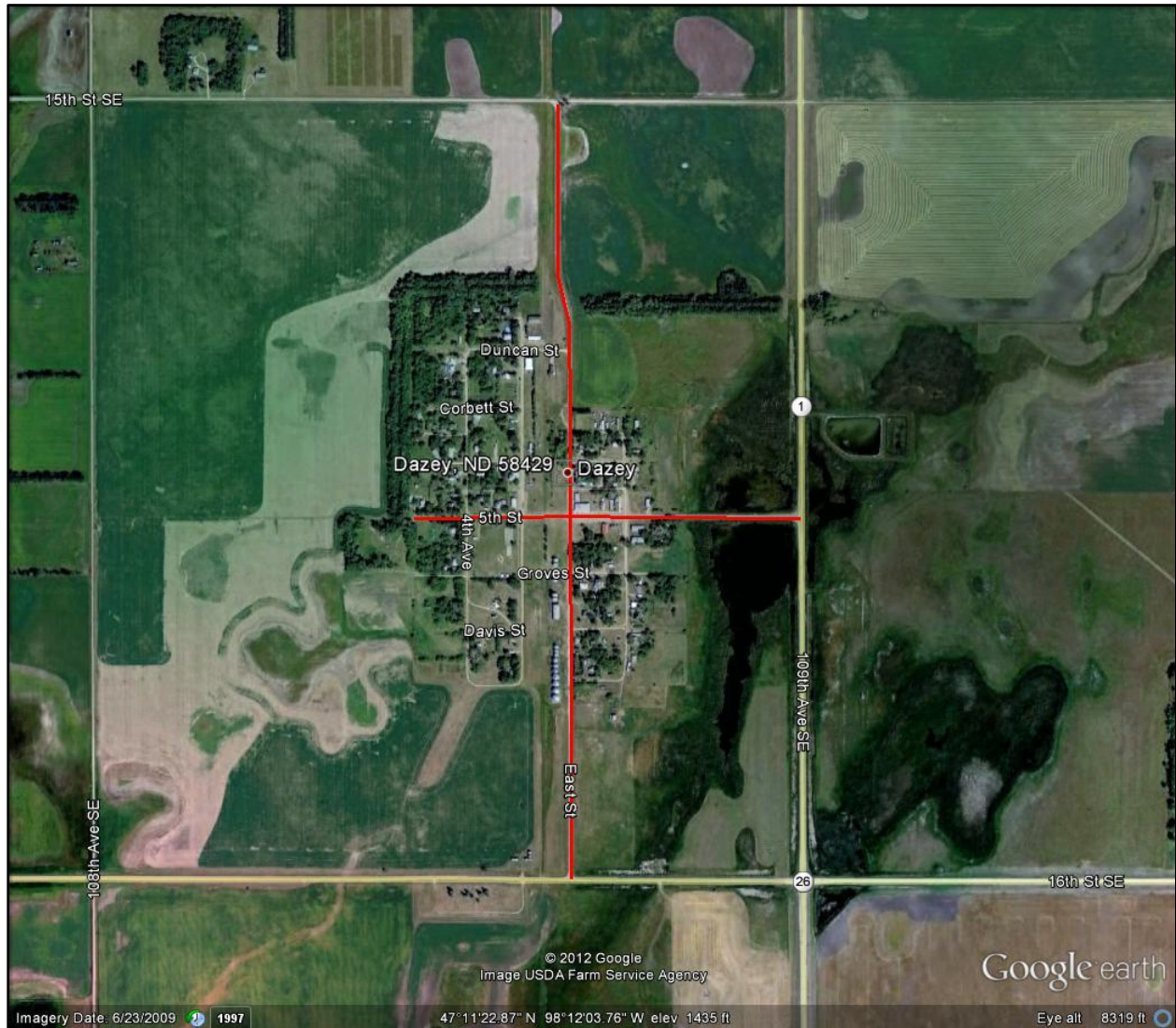


Source: Barnes County Highway Department

Evacuation routes are necessary in mitigation to reduce or eliminate loss of life and injury during hazards.

Figures 9.8 to 9.18 show the evacuation routes for incorporated jurisdictions in Barnes County. The extent of each evacuation route is shown in red.

**Figure 9.8 – City of Dazey Evacuation Routes**



Source: Barnes County Emergency Management

Figure 9.9 – City of Fingal Evacuation Routes



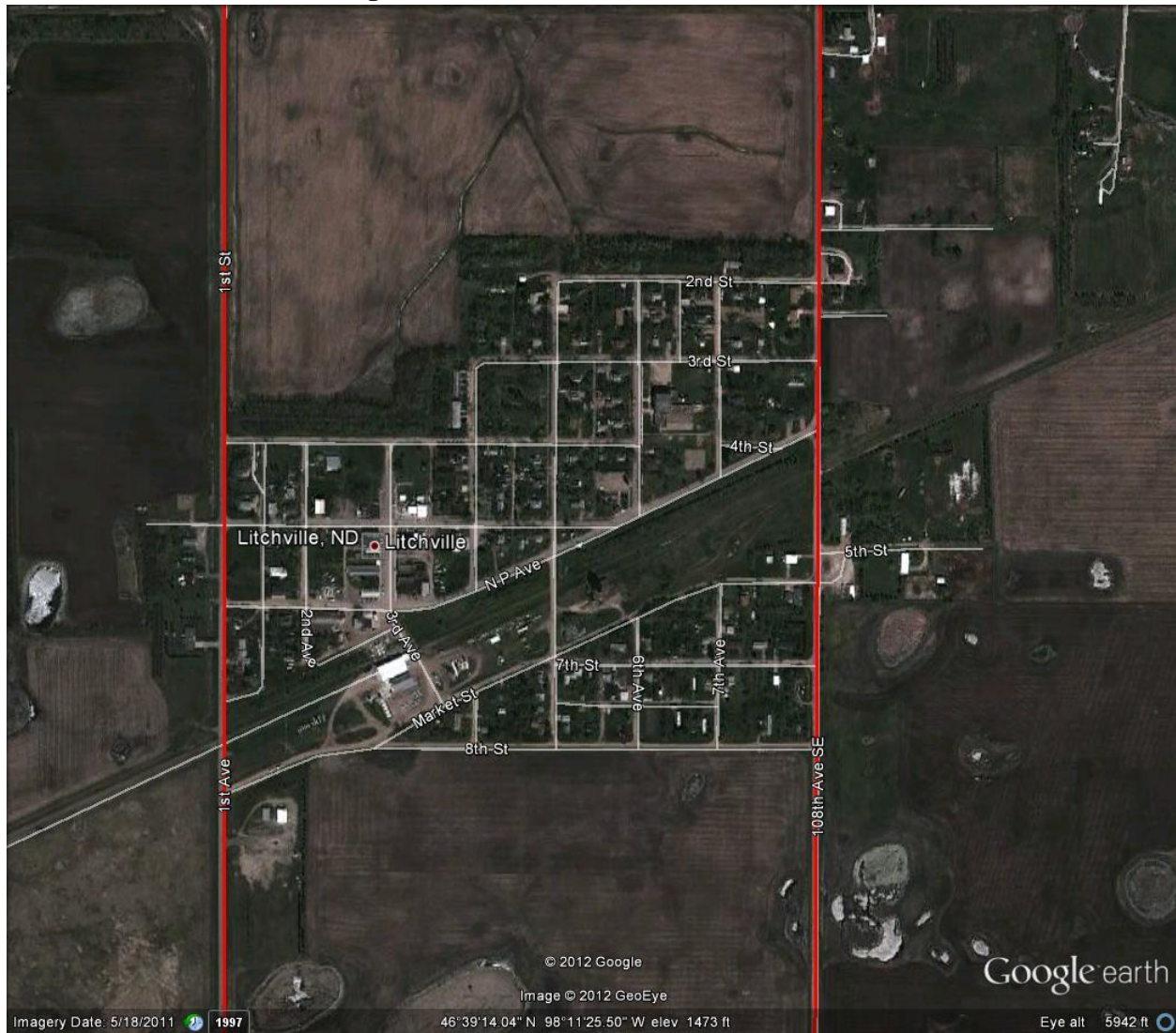
Source: Barnes County Emergency Management

Figure 9.10 – Leal Evacuation Routes



Source: Barnes County Emergency Management

Figure 9.11 – Litchville Evacuation Routes



Source: Barnes County Emergency Management

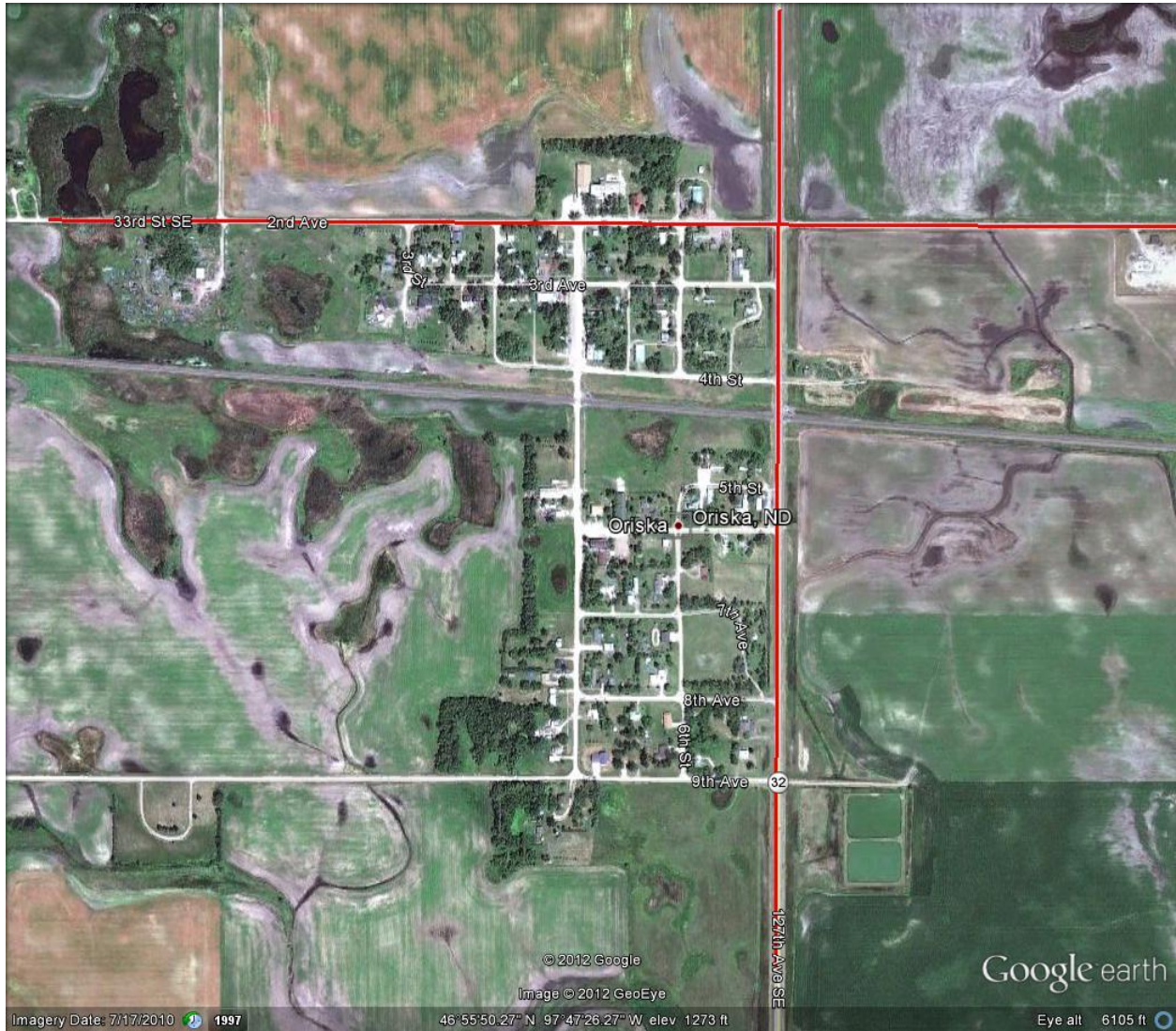
Figure 9.12 – Nome Evacuation Routes



Source: Barnes County Emergency Management

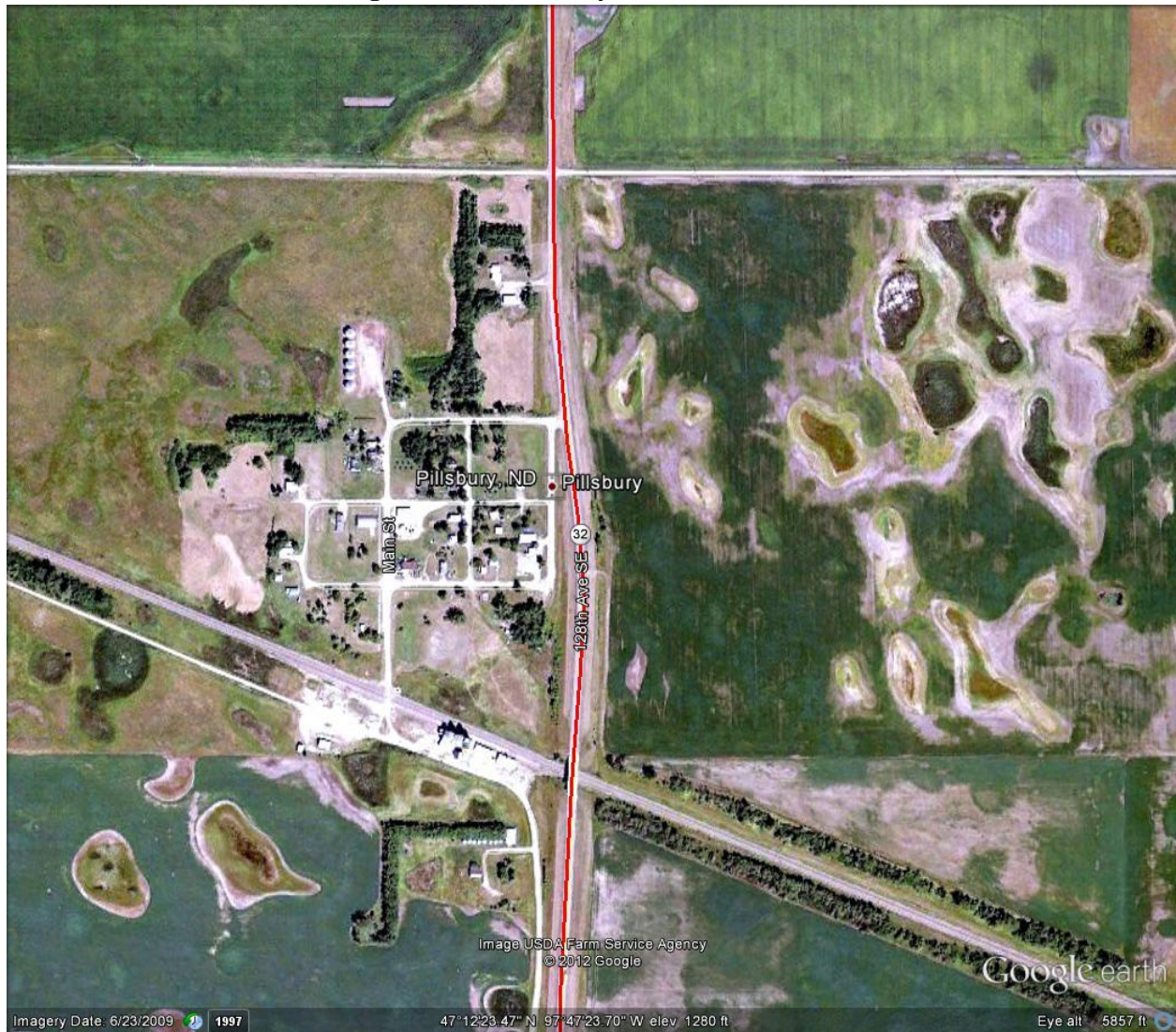


Figure 9.13 – Oriska Evacuation Routes



Source: Barnes County Emergency Management

Figure 9.14 – Pillsbury Evacuation Routes



Source: Barnes County Emergency Management

Figure 9.15 – Rogers Evacuation Routes



Source: Barnes County Emergency Management

Figure 9.16 – Sanborn Evacuation Routes



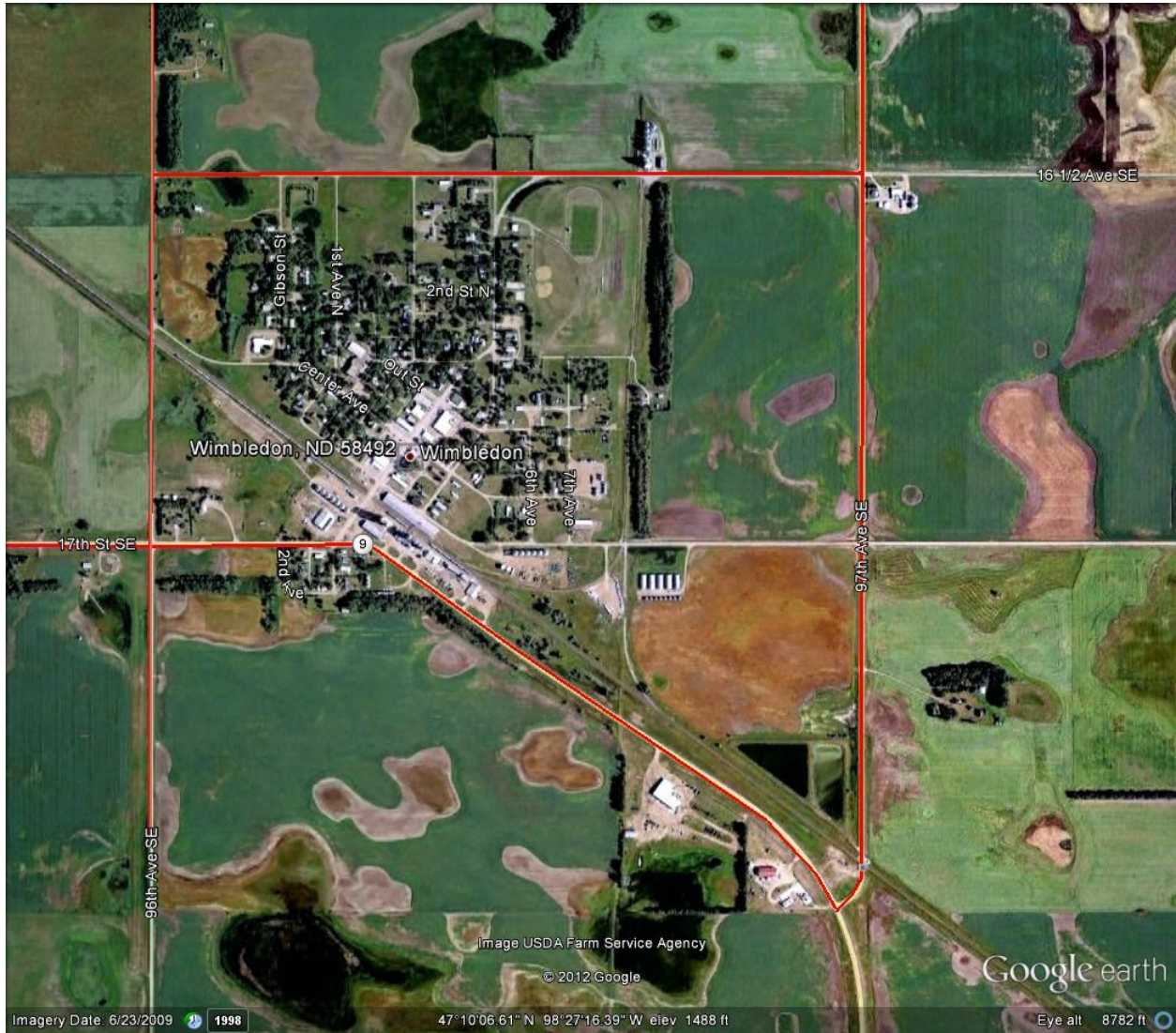
Source: Barnes County Emergency Management

Figure 9.17 – Sibley Evacuation Routes



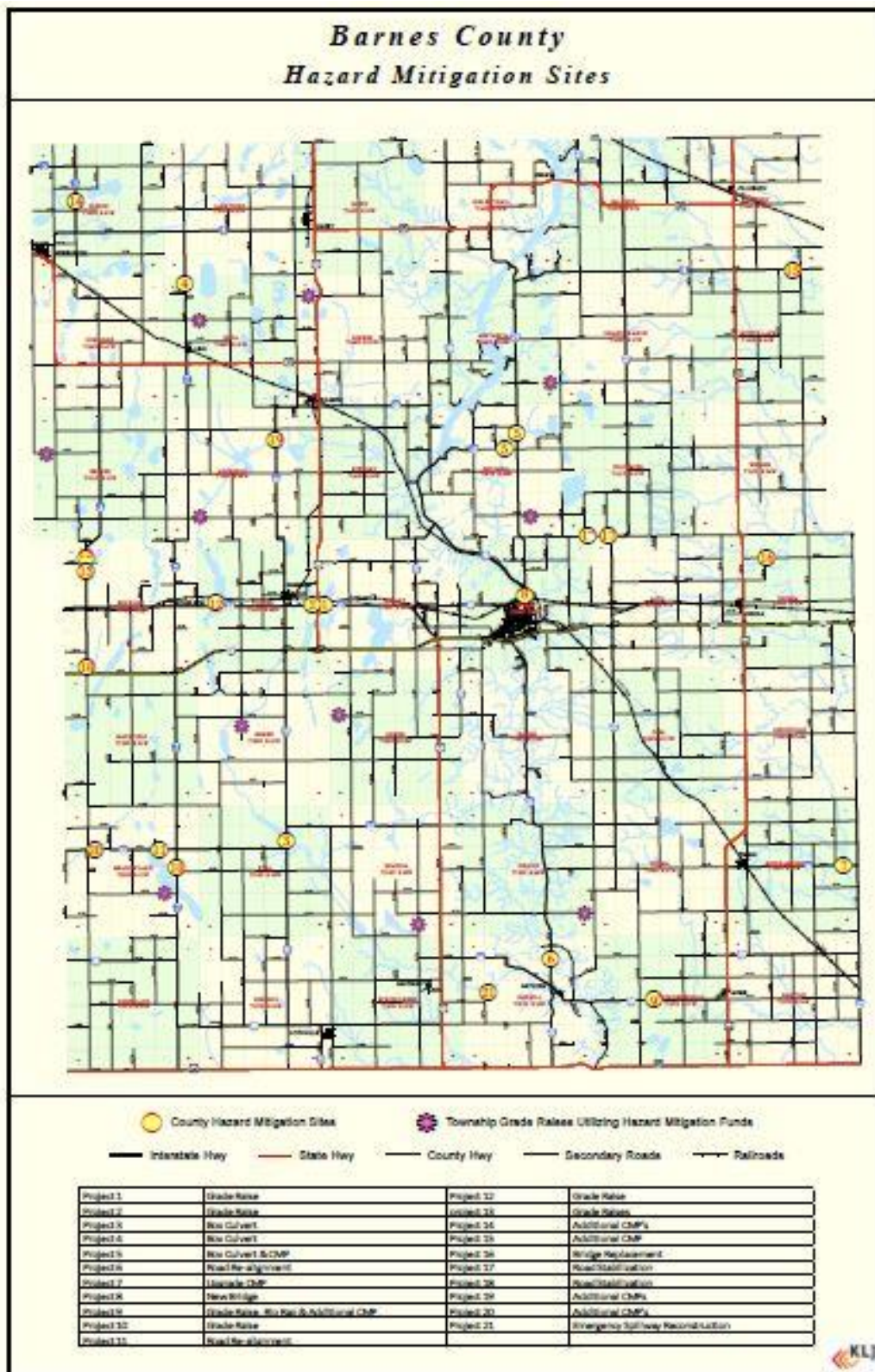
Source: Barnes County Emergency Management

Figure 9.18 – Wimbledon Evacuation Routes



Source: Barnes County Emergency Management

Figure 9.19 – Barnes County Road Hazard Mitigation Sites



Source: Barnes County Highway Department, Kadmas, Lee & Jackson (KLJ)

Figure 9.20 – Barnes County Load Restrictions Map



Source: Barnes County Highway Department, Kadmas, Lee & Jackson (KLJ)



There is one municipal airport in Barnes County are located in Valley City. An aerial map of the airport is shown and was obtained from the North Dakota Aeronautics Commission (NDAC). The NDAC was established in 1947 by the state legislature, assigning responsibility for state aviation functions and serves the public by providing economic and technical assistance for the aviation community.

Figure 9.21 – Barnes County Municipal Airport



Source: North Dakota Aeronautics Commission

Figure 9.22 shows the geographic extent of school districts covering Barnes County. Understanding the boundaries of school districts is important for mitigation to help identify where vulnerable populations are located that would need evacuation assistance in the event of a hazard.

**Figure 9.22 – Barnes County School Districts**



Source: North Dakota Geographic Information Systems

Figure 9.23 – City of Dazey



Source: Barnes County Emergency Management

Figure 9.24 – City of Fingal



Source: Barnes County Emergency Management

Figure 9.25 – City of Kathryn



Source: Barnes County Emergency Management

Figure 9.26 – City of Leal



Source: Barnes County Emergency Management

Figure 9.27 – City of Litchville



Source: Barnes County Emergency Management

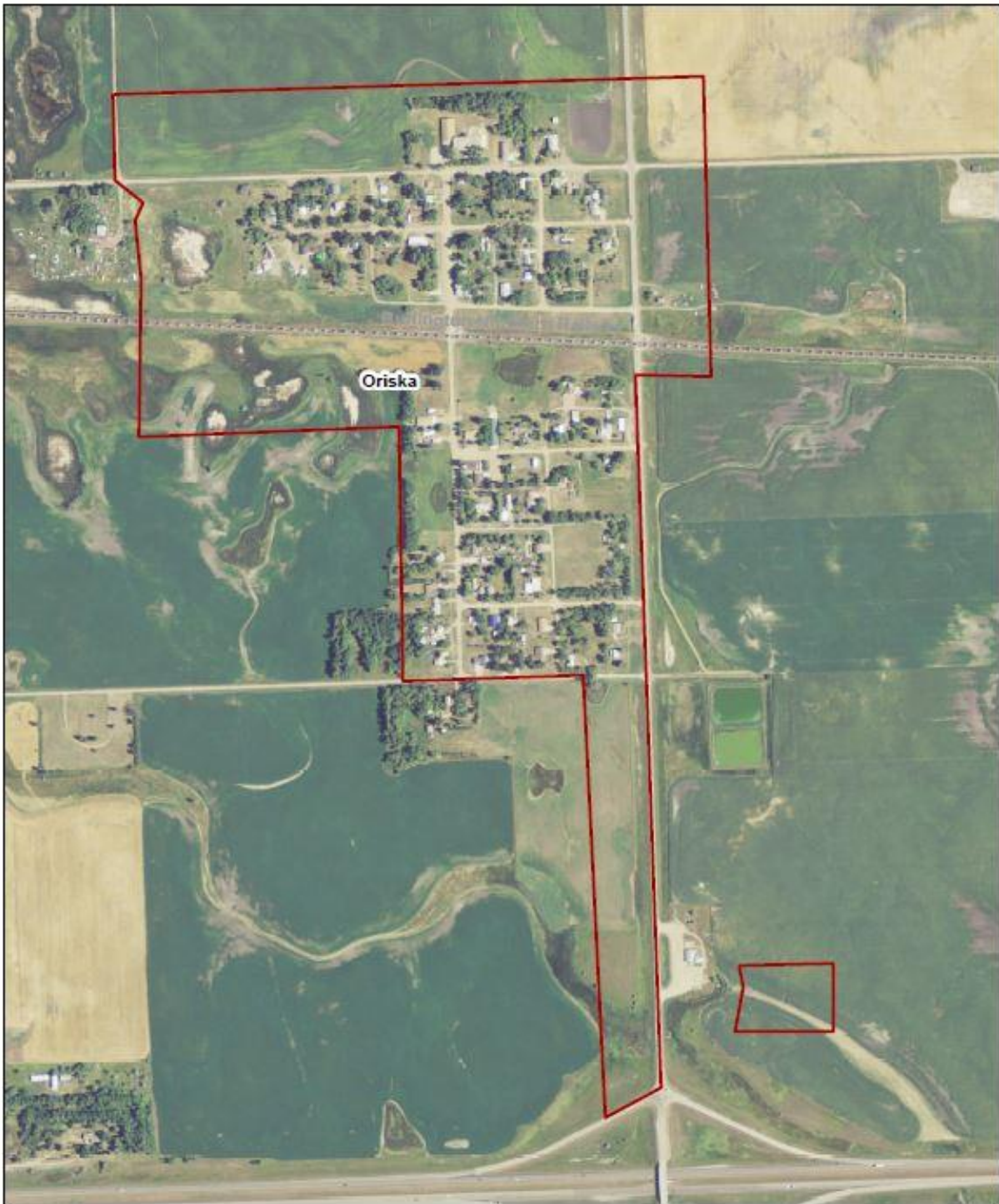
Figure 9.28 – City of Nome



Source: Barnes County Emergency Management



Figure 9.29 – City of Oriska



Source: Barnes County Emergency Management

Figure 9.30 – City of Pillsbury



Source: Barnes County Emergency Management

Figure 9.31 – City of Rogers



Source: Barnes County Emergency Management

Figure 9.32 – City of Sanborn



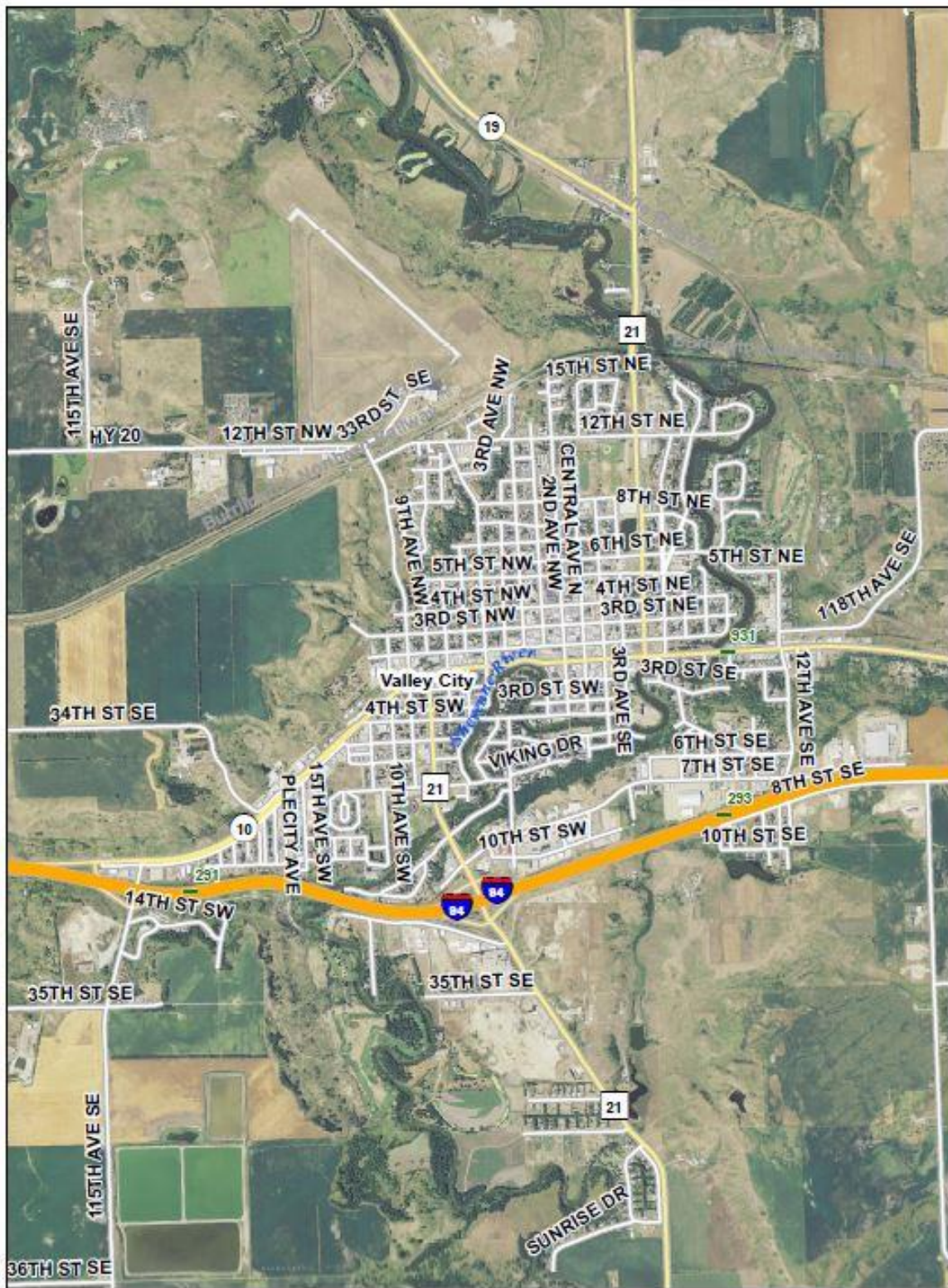
Source: Barnes County Emergency Management

Figure 9.33 – City of Sibley



Source: Barnes County Emergency Management

Figure 9.34 – City of Valley City



Source: Barnes County Emergency Management

Figure 9.35 – City of Wimbledon



Source: Barnes County Emergency Management

## 10. Plan Maintenance

Mitigation planning for Barnes County, North Dakota is continuous. An important aspect of any useable plan is the maintenance and upkeep of the document. At any given time, planning, risk analysis, updating the risk assessment, research, coordinating, disaster response or other activity is occurring. Thus, ensuring the plan will remain useful is critical.

### Plan Monitoring

Barnes County's emergency manager and the LEPC are responsible for monitoring, evaluating and updating the plan. All disaster and emergency incidents will be evaluated for general and specific hazard history and mitigation strategy recommendations to be added to the plan.

The plan will be updated and submitted to the N.D. Dept. of Emergency Services and FEMA within five years to assure the county maintains a FEMA-approved multi-jurisdictional multi-hazard mitigation plan.

### Plan Evaluation

At its February meeting each year, each county commission, city council/commission and emergency response entity will review actions taken on mitigation projects and losses due to hazards in the past year.

- **A Mitigation Action Progress Report Form for reporting of annual mitigation actions taken and losses due to hazards is included in this chapter for Barnes County.**
- **The annual reports are due back to each respective emergency manager by March 15.**

The comments about the plan, project implementation, and information will be shared through each jurisdiction's minutes, and these minutes will be sent to county emergency management. The emergency manager will share this information with the Barnes County Commission. Emergency services and the public health department will be encouraged to inform emergency management of incidents constantly and consistently as they occur so that the data can be immediately considered to better understand the risks in the county and enable accurate updating of hazard information to include in hazard mitigation efforts.

### Public Involvement

The public will be informed of the opportunity to comment on plan updates through the advertising of the jurisdiction meetings. The plan will be available to the public at the Barnes County Courthouse and at the city halls in each of the jurisdictions. During plan updates, the plan will also be on the emergency management website for Barnes County. The public is encouraged to share input on the plan.



**10.1 Barnes County, N.D. Mitigation Action Progress Report Form**

The Mitigation Action Progress Report Form is part of the annual review of hazard impacts, mitigation projects and reporting of data to the emergency manager. Please complete to maintain the mitigation plan for Barnes County. Include date and location of incident(s), and photographs or other documentation.

**Additional information can be included and attached to this form on a separate page.**

**Return to:** Barnes County Emergency Manager  
 1525 12<sup>th</sup> St. NW  
 Valley City, ND 58072

**Due:** March 15

List injuries or property losses due to hazards in past year:

List new vulnerable areas that need to be addressed:

Identify what actions on jurisdiction’s mitigation projects were taken in past year:

If no action, why:

<b>First &amp; Last Name</b>	
<b>Title &amp; Jurisdiction Represented</b>	
<b>Date (MM/DD/YYYY)</b>	
<b>Contact Info (Email &amp; Phone)</b>	