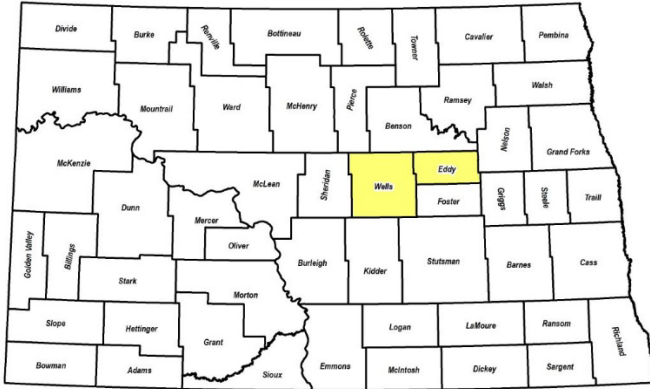


2023 Eddy & Wells Counties, N.D. Multi-Jurisdictional Multi-Hazard Mitigation Plan



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Appendices

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

The Planning Area 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, jurisdiction, and county and city officials identified 14 natural hazards and man-made threats to be included 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 Eddy County, North Dakota, and Wells 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 & Wildland)
- Flood (Overland & Riverine)
- Geologic Hazards
- Hazardous Material Release
- Infectious Disease & Pest Infestations – Animal, Human & Plant
- Severe Summer Weather
- Severe Winter Weather
- Space Weather
- Transportation Incident

The Planning Area history illustrates a considerable risk of damage from disasters. The Federal Emergency Management Agency (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 The Planning Area pertaining to these disasters.

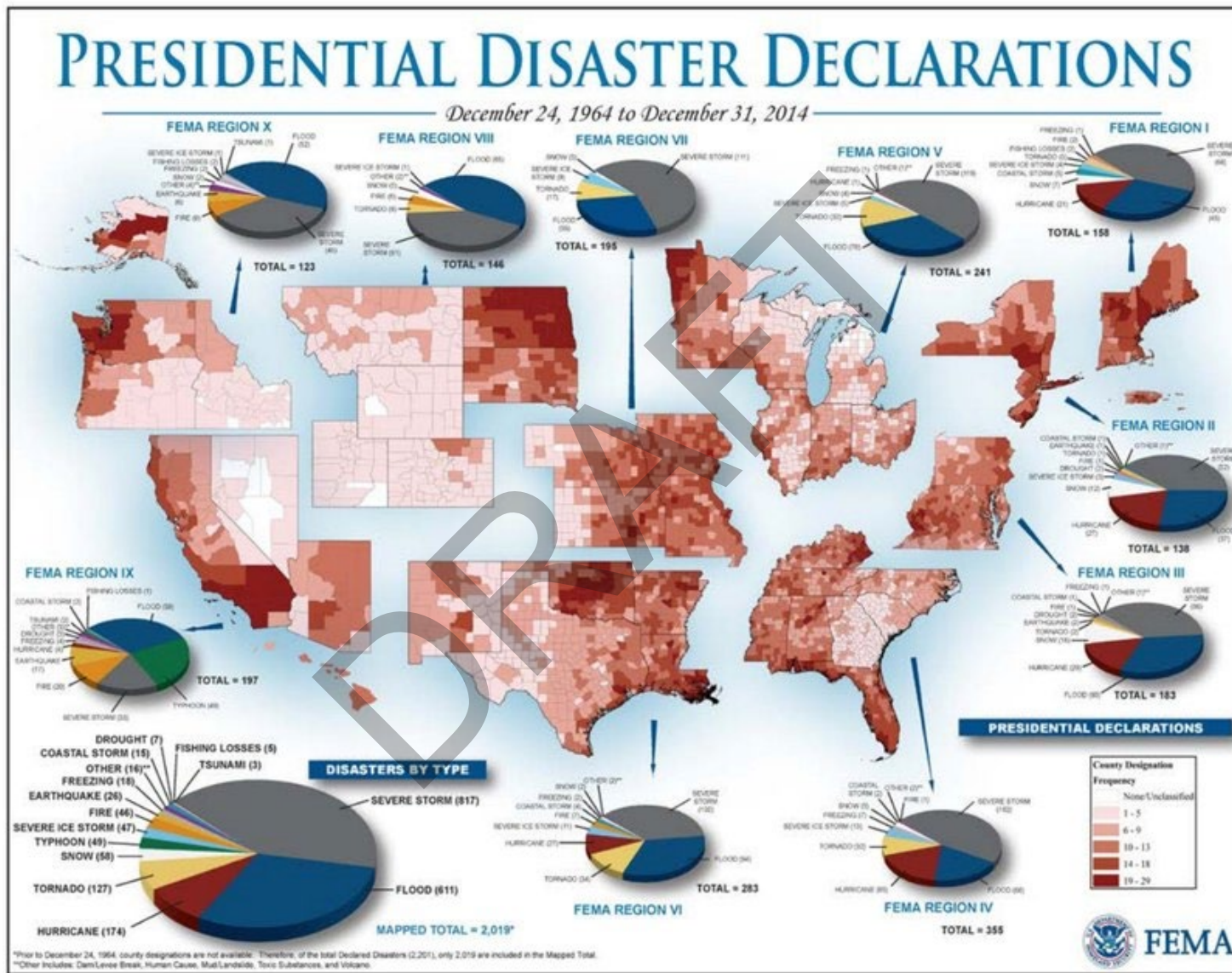
Since 1953, Eddy County has had 25 Presidential Disaster Declarations and Wells County has had 28 Presidential Disaster Declarations. Table 4.1 shows declarations for Eddy County and Table 4.2 shows declarations for Wells County. These declarations highlight the hazards that will result in losses in The Planning Area, and the value of mitigation to reduce and/or eliminate losses to people and property.

The following are key points:

- In **Eddy County**, most presidential disaster declarations (17) have occurred between the months of April and July of any given year. No declarations have been declared during the months of February, October, November, or December.
- In **Wells County**, most presidential disaster declarations (20) have occurred between the months of April and July of any given year. No declarations have been declared during the months of August, November, or December.

The Presidential Disaster Declarations that are unique to either Eddy County or Wells County are bolded in Table 4.1 following Figure 4.1.

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 – May 2, 1953, to May 4, 2023, Eddy County, North Dakota Presidential Disaster Declarations

Year	Disaster Description/Title	Disaster Number
1969	Flooding	256
1974	Heavy Rains, Snowmelt & Flooding	434
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 Winter Storms and Blizzard Conditions	1157
1997	Severe Flooding, Severe Winter Storms, Snowmelt, Spring Rains	1174
1999	Severe Storms, Flooding, Snow, Ice Ground Saturation, Landslides, and Mudslides	1279
2000	Severe Storms, Flooding and Ground Saturation	1334
2001	Severe Storms, Flooding, & Ground Saturation	1376
2004	Severe Storms, Flooding, and Ground Saturation	1515
2005	Hurricane Katrina Evacuation	3247
2009	Severe Storms and Flooding	1829
2010	Flooding	1907
2011	Flooding	3318
2011	Flooding	1981
2013	Flooding	4118
2014	Severe Storms and Flooding	4190
2020	Flood	4475
2020	Biological	3477
2020	Biological	4509

Source: Federal Emergency Management Agency

Table 4.2 – May 2, 1953, to May 4, 2023, Eddy County, North Dakota Presidential Disaster Declarations

Year	Disaster Description/Title	Disaster Number
1969	Flooding	256
1974	Heavy Rains, Snowmelt & Flooding	434
1975	Flooding From Rains & Snowmelt	469
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 Winter Storms and Blizzard Conditions	1157
1997	Severe Flooding, Severe Winter Storms, Snowmelt, Spring Rains	1174
1999	Severe Storms, Flooding, Snow, Ice Ground Saturation, Landslides, and Mudslides	1279
2000	Severe Storms, Flooding and Ground Saturation	1334
2001	Severe Storms, Flooding, & Ground Saturation	1376
2005	Hurricane Katrina Evacuation	3247
2009	Severe Storms and Flooding	1829
2010	Severe Winter Storm	1901
2010	Flooding	1907
2011	Flooding	1981
2013	Flooding	4118
2013	Severe Storms and Flooding	4128
2020	Flood	4475
2020	Biological	3477
2020	Biological	4509
2020	Flood	4553
2020	Severe Storm	4565
2022	Severe Storm	4660
2023	Snowstorm	4686

Source: Federal Emergency Management Agency

Risk Assessment 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
 - Foundation for mitigation strategy development

The risk assessment was conducted using the scoring and ranking process found on the following pages.

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:

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:

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:

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

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 – The Planning Area Jurisdiction Risk Assessment Scoring Summary - Continued

Risk Assessment		Jurisdiction: City of Sheyenne (Eddy Co.)				
Hazard	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Communicable Disease	3	2	2	3	1	9
Dam Failure	3	2	1	2	2	6
Drought	3	2	3	3	1	10
Flood	4	3	4	3	1	13
Hazardous Material Release	3	2	3	3	1	10
Homeland Security Incident	3	2	2	2	1	8
Severe Summer Weather	3	4	4	4	1	14
Severe Winter Weather	3	4	4	3	1	13
Transportation Accident	3	3	3	3	1	11
Urban Fire/Structure Collapse	3	3	3	3	1	11
Wildland Fire	3	3	3	3	1	11
Windstorm	3	3	3	3	1	11

Risk Assessment		Jurisdiction: Wells County, North Dakota				
Hazard	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Communicable Disease	4	2	3	2	2	9
Dam Failure	4	2	2	3	3	8
Drought	4	2	4	3	1	12
Flood	4	4	4	4	2	14
Hazardous Material Release	4	2	4	3	1	12
Homeland Security Incident	4	1	2	3	1	9
Severe Summer Weather	3	4	4	3	1	13
Severe Winter Weather	3	4	4	3	1	13
Transportation Accident	4	4	4	4	1	15
Urban Fire/Structure Collapse	3	3	4	3	1	12
Wildland Fire	3	3	4	4	2	12
Windstorm	3	4	4	3	1	13

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

Table 4.2 – The Planning Area Jurisdiction Risk Assessment Scoring Summary - Continued

Risk Assessment		Jurisdiction: City of Bowdon (Wells Co.)				
Hazard	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Communicable Disease	2	2	2	3	1	8
Dam Failure	NA	NA	NA	NA	NA	NA
Drought	3	3	3	3	2	10
Flood	3	2	2	3	1	9
Hazardous Material Release	2	2	2	2	1	7
Homeland Security Incident	2	2	2	2	1	7
Severe Summer Weather	4	3	4	3	1	13
Severe Winter Weather	4	3	4	3	1	13
Transportation Accident	2	2	2	2	1	7
Urban Fire/Structure Collapse	2	2	3	2	1	8
Wildland Fire	2	2	3	2	1	8
Windstorm	3	3	3	3	1	11

Risk Assessment		Jurisdiction: City of Cathay (Wells Co.)				
Hazard	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Communicable Disease	2	2	2	3	1	8
Dam Failure	4	1	2	3	2	8
Drought	3	3	3	3	2	10
Flood	3	2	2	3	1	9
Hazardous Material Release	2	2	2	2	1	7
Homeland Security Incident	2	2	2	2	1	7
Severe Summer Weather	4	3	4	3	1	13
Severe Winter Weather	4	3	4	3	1	13
Transportation Accident	2	2	2	2	1	7
Urban Fire/Structure Collapse	2	2	3	2	1	8
Wildland Fire	2	2	3	2	1	8
Windstorm	3	3	3	3	1	11

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

Table 4.2 – The Planning Area Jurisdiction Risk Assessment Scoring Summary - Continued

Risk Assessment		Jurisdiction: City of Fessenden (Wells Co.)				
Hazard	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Communicable Disease	3	2	2	2	1	8
Dam Failure	NA	NA	NA	NA	NA	NA
Drought	3	3	3	3	1	11
Flood	4	4	4	4	1	15
Hazardous Material Release	4	2	3	4	1	12
Homeland Security Incident	3	2	2	2	1	8
Severe Summer Weather	3	4	4	3	2	12
Severe Winter Weather	3	4	4	3	2	12
Transportation Accident	3	3	3	3	1	11
Urban Fire/Structure Collapse	3	4	4	3	2	12
Wildland Fire	3	4	3	4	2	12
Windstorm	3	4	4	3	2	12

Risk Assessment		Jurisdiction: City of Hamberg (Wells Co.)				
Hazard	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Communicable Disease	2	2	2	3	1	8
Dam Failure	NA	NA	NA	NA	NA	NA
Drought	3	3	3	3	2	10
Flood	3	2	2	3	1	9
Hazardous Material Release	2	2	2	2	1	7
Homeland Security Incident	2	2	2	2	1	7
Severe Summer Weather	4	3	4	3	1	13
Severe Winter Weather	4	3	4	3	1	13
Transportation Accident	2	2	2	2	1	7
Urban Fire/Structure Collapse	2	2	3	2	1	8
Wildland Fire	2	2	3	2	1	8
Windstorm	3	3	3	3	1	11

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

Table 4.2 – The Planning Area Jurisdiction Risk Assessment Scoring Summary - Continued

Risk Assessment		Jurisdiction: City of Harvey (Wells Co.)				
Hazard	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Communicable Disease	3	4	2	4	2	13
Dam Failure	4	2	2	3	3	8
Drought	4	3	3	4	2	12
Flood	4	4	4	4	1	15
Hazardous Material Release	4	4	4	4	1	15
Homeland Security Incident	3	2	2	2	1	8
Severe Summer Weather	3	4	4	3	2	12
Severe Winter Weather	3	4	4	3	2	12
Transportation Accident	3	3	3	3	1	11
Urban Fire/Structure Collapse	3	4	4	3	2	12
Wildland Fire	3	4	3	4	2	12
Windstorm	3	4	4	3	2	12

Risk Assessment		Jurisdiction: City of Hurdsfield (Wells Co.)				
Hazard	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Communicable Disease	2	2	2	3	1	8
Dam Failure	NA	NA	NA	NA	NA	NA
Drought	3	3	3	3	2	10
Flood	3	2	2	3	1	9
Hazardous Material Release	2	2	2	2	1	7
Homeland Security Incident	2	2	2	2	1	7
Severe Summer Weather	4	3	4	3	1	13
Severe Winter Weather	4	3	4	3	1	13
Transportation Accident	2	2	2	2	1	7
Urban Fire/Structure Collapse	2	2	3	2	1	8
Wildland Fire	2	2	3	2	1	8
Windstorm	3	3	3	3	1	11

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

Table 4.2 – The Planning Area Jurisdiction Risk Assessment Scoring Summary - Continued

Risk Assessment							Jurisdiction: City of Sykeston (Wells Co.)					
Hazard	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total						
Communicable Disease	2	2	3	3	1	9						
Dam Failure	4	2	2	3	3	8						
Drought	4	3	3	4	2	12						
Flood	3	3	3	3	1	11						
Hazardous Material Release	3	2	2	3	1	9						
Homeland Security Incident	3	2	2	2	1	8						
Severe Summer Weather	3	4	4	3	2	12						
Severe Winter Weather	3	4	4	3	2	12						
Transportation Accident	3	2	3	3	1	10						
Urban Fire/Structure Collapse	3	2	2	3	1	9						
Wildland Fire	3	4	3	4	2	12						
Windstorm	3	4	4	3	2	12						

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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.

Seasonal Pattern	None. Extreme winter weather can limit or eliminate activity altogether.
Duration	Minutes/hours/days/weeks/months/potentially a year or more.
Speed of Onset	Little to no warning or several days/weeks.
Location	<p>Total geographic extent of Eddy County, North Dakota and Wells County, North Dakota. Most likely targeting information databases at critical facilities and infrastructure such as government facilities (city halls, courthouses, fire halls, public works), medical facilities, major employers, roads/highways and railroad infrastructure, or chemical and oil and gas infrastructure such as pipelines and Tier II Sites.</p> <p><u>Eddy County</u></p> <ul style="list-style-type: none"> • Alliance Natural Gas Pipeline • Burlington Northern Santa Fe (BNSF) Railroad • Cenex Non-HVL Products Pipeline • Eddy County Courthouse • Luther Home-Good Shepherd • New Rockford Public School • N.D. Highways 9, 15, 20, 200 • Red River Valley & Western (RRV&W) Railroad • Tier II Sites • U.S. Highway 281 <p><u>Wells County</u></p> <ul style="list-style-type: none"> • Alliance Natural Gas Pipeline • Burlington Northern Santa Fe (BNSF) Railroad • Canadian Pacific (CP) Railway • Cenex Non-HVL Products Pipeline • Fessenden-Bowdon Public School • Fessenden Coop • Harvey Dam • Harvey Municipal Airport • Harvey Public School • Kinder Morgan Propane Pipeline • N.D. Highways 3, 15, 30, 200 • St. Aloisius Hospital and Medical Center

	<ul style="list-style-type: none">• Tier II Sites• U.S. Highway 52• Wells County Courthouse• Wells County Fairgrounds/Festival Hall
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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>

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4.1.1 Civil Disturbance – Eddy County, North Dakota

History

According to Eddy County Sheriff's Office and Eddy County Emergency Management, no incidents of civil disturbance have occurred in Eddy County.

There has been no declared disaster/emergency pertaining to a civil disturbance in Eddy County.

Probability

The probability of a hazard or threat is how likely 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, public schools, or government facilities like the Eddy County Courthouse or public schools. Energy pipelines and national highways are major pieces of infrastructure that could attract interest from environmental groups. Communication and transportation infrastructure is a probable location for civil disturbances. In Eddy County, there are four cell phone towers, and BNSF and RRV&W railroad infrastructure.

Profile meeting participants ranked the probability of civil disturbance as “possible,” meaning there is a 25 percent probability in the next year of an incident. It is likely a civil disturbance will occur at some point in the future in Eddy County and/or in North Dakota.

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. Extent/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.

Profile meeting participants ranked the extent/magnitude of a civil disturbance as catastrophic meaning substantial damage to the jurisdiction's infrastructure, people, and/or property can be affected.

Risk Assessment

Table 4.1.1.1 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 4.1.1.1 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 4.1.1.1 – Eddy County, North Dakota Civil Disturbance Risk Assessment Scored Chart

Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Eddy County	3	1	2	3	1	8
City of New Rockford	3	1	2	3	1	8
City of Sheyenne	4	1	1	2	1	7

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

Table 4.1.1.2 provides information on the specific impact, frequency, likelihood, vulnerability, and capability of civil disturbance in Eddy 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 the county and incorporated jurisdictions, such as the Eddy County Courthouse, Lutheran Home-Good Shepherd, New Rockford Public School, or buildings supporting emergency services such as ambulance and fire 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. Critical facilities such as the Eddy County Courthouse, Eddy County Highway Department shops, Lutheran Home-Good Shepherd, New Rockford Public School, ambulance and fire halls, and infrastructure such as electric power/substations, water/wastewater facilities, and Tier II sites are vulnerable to the threat.

A summary of critical facilities and infrastructure is provided in Chapter 3, Profile and Inventory.

Vulnerabilities to New and Future Development

Civil disturbances are hard 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 developments 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.

Table 4.1.1.2 – Eddy County, North Dakota Civil Disturbance Risk Assessment

<p>Impact</p>	<ul style="list-style-type: none"> Blocked Roads & Business Interruptions Delayed Emergency Response Financial Hardship/Strain (public and private) HAZMAT Release – Tier II Sites or transportation vehicles Human Injury/Death Increased Public Safety Runs Loss of Communication Infrastructure 	<ul style="list-style-type: none"> Loss/Overcrowded Medical Facilities Loss of Potable Water Loss of Power Mass Casualties/Fatalities Property Damage (Structure) Property Damage (Vehicle)
<p>Frequency</p>	<ul style="list-style-type: none"> No occurrences in Eddy County 	
<p>Likelihood</p>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> Increasing hostility/turmoil directed at the energy industry Increasing political turmoil at all levels of government Social discord from the COVID-19 and social media Presence of U.S. Highways 52 and 281, and ND Highways 9, 15, and 20 BNSF and RRVW Railroad infrastructure Presence of Tier II Sites Communications infrastructure (four cell phone towers) 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> Sparse population and rural area of the state/country County not located near a major metropolitan population, international airport, stadiums, or significant tourist attraction Lack of major television station in Eddy County No interstate highway Eddy County Sheriff’s Office N.D. State and Local Intelligence Center (SLIC)
<p>Vulnerability</p>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> Increasing hostility/turmoil directed at the energy industry Increasing political turmoil at all levels of government Social discord from the COVID-19 and social media Funding of extreme groups by “Dark Money” from billionaires/crowd-funding websites Limited law enforcement in rural areas of county Inadequate mental health services in county/state Presence of U.S. Highways 52 and 281, and ND Highways 9, 15, and 20 BNSF and RRVW Railroad infrastructure Presence of Tier II Sites Communications infrastructure (four cell phone towers) 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> Sparse population and rural area of the state/country County not located near a major metropolitan population, international airport, stadiums, or significant tourist attraction Lack of major television station in Eddy County No interstate highway Eddy County Sheriff’s Office N.D. State and Local Intelligence Center (SLIC) Civic participation by location population in neighborhood watch-like activities reporting suspicious behavior Eddy County Courthouse and the public schools have cameras and door locking systems
<p>Capability</p>	<ul style="list-style-type: none"> See Chapter 7 for a list of capabilities to address civil disturbance. 	

Data Limitations and Other Key Documents

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

This plan incorporates data from the following documents and information herein will be used in future updates.

- 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)
- Eddy County Evacuation Plan through Eddy County Emergency Management
- Eddy County Local Emergency Operations Plan (LEOP)
- Eddy County Mass Care Plan through Lake Region District Health Unit
- Eddy County Shelter Plan through Eddy County Emergency Management
- Eddy County Threat and Hazard Identification and Risk Assessment (THIRA)
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan, Civil Disturbance Annex
- North Dakota State Disaster Recovery Plan
- North Dakota State Preparedness Report (SPR)
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

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4.1.2 Civil Disturbance – Wells County, North Dakota

History

According to Wells County Sheriff's Office and Wells County Emergency Management, no incidents of civil disturbance have occurred in Wells County.

There has been no declared disaster/emergency pertaining to a civil disturbance in Wells County.

Probability

The probability of a hazard or threat is how likely 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, public schools, or government facilities like the Wells County Courthouse or public schools. Energy pipelines and national highways are major pieces of infrastructure that could attract interest from environmental groups.

Communication infrastructure, energy pipelines, and transportation infrastructure are probable locations for civil disturbances. In Wells County, there are 12 cell phone towers, two ND State Radio Repeater Towers, energy pipelines, and BNSF Railroad and CP Railway.

Profile meeting participants ranked the probability of civil disturbance as “possible,” meaning that there is a 25 percent probability in the next year of an incident. It is likely a civil disturbance will occur at some point in the future in Wells County and/or in North Dakota.

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. Extent/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.

Profile meeting participants ranked the extent/magnitude of a civil disturbance as catastrophic meaning substantial damage to the jurisdiction's infrastructure, people, and/or property can be affected.

Risk Assessment

Table 4.1.2.1 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 4.1.2.1 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 4.1.2.2 provides information on the specific impact, frequency, likelihood, vulnerability, and capability of civil disturbance in Wells 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 4.1.2.1 – Wells County, North Dakota Civil Disturbance Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Wells County	4	1	2	2	2	7
City of Bowdon	2	1	2	1	1	5
City of Cathay	2	1	2	1	1	5
City of Fessenden	3	1	2	2	1	7
City of Hamberg	2	1	2	1	1	5
City of Harvey	3	1	2	2	2	6
City of Hurdsfield	2	1	2	1	1	5
City of Sykeston	3	1	2	1	1	6

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

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 the county and incorporated jurisdictions, such as the Wells County Courthouse, KTL Building, Wells County Highway Department shops, St. Aloisius Hospital & Medical Center, Fessenden-Bowdon Public School, Harvey Public School, Wells County Public Health, or buildings supporting emergency services such as ambulance and fire 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. Critical facilities such as the Wells County Courthouse, KTL Building, Wells County Highway Department shops, St. Aloisius Hospital & Medical Center, Fessenden-Bowdon Public School, Harvey Public School, Wells County Public Health, ambulance and fire halls, and infrastructure such as electric power/substations, water/wastewater facilities, and Tier II sites are vulnerable to the threat. In addition, Wells County has 12 cell phone towers, two N.D. State Radio Repeater Towers, and three energy pipelines.

A summary of critical facilities and infrastructure is provided in Chapter 3, Profile and Inventory.

Vulnerabilities to New and Future Development

Civil disturbances are hard 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 developments 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.

Table 4.1.2.2 – Wells County, North Dakota Civil Disturbance Risk Assessment

<p>Impact</p>	<ul style="list-style-type: none"> • Blocked Roads • Business Interruptions • Delayed Emergency Response • Financial Hardship/Strain (public and private) • HAZMAT Release – Tier II Sites or transportation vehicles • Human Injury/Death • Increased Public Safety Runs • Loss of Communication Infrastructure 	<ul style="list-style-type: none"> • Loss/Overcrowded Medical Facilities • Loss of Potable Water • Loss of Power • Mass Casualties/Fatalities • Property Damage (Structure) • Property Damage (Vehicle)
<p>Frequency</p>	<ul style="list-style-type: none"> • In 2013, a fugitive jumped on the train in Harvey and lead law enforcement to the city of Drake where he was arrested. 	<ul style="list-style-type: none"> • Annual occurrences of localized unrest from community individuals
<p>Likelihood</p>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> • Increasing hostility/turmoil directed at the energy industry • Increasing political turmoil at all levels of government • Social discord from the COVID-19 and social media • U.S. Highway 52; ND Highways 3, 15, and 200 • BNSF and CP Railroad infrastructure • Tier II Sites • Energy Pipelines • Communications infrastructure (12 cell phone towers, two N.D. State Radio Repeaters) and industrial-scale electric transmission 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> • Sparse population and rural area of the state/country • County not located near a major metropolitan population, international airport, stadiums, or significant tourist attraction • Lack of major television station in Wells County • No interstate highway • Wells County Sheriff’s Office • N.D. State and Local Intelligence Center (SLIC) • Civic participation by location population in neighborhood watch-like activities reporting suspicious behavior
<p>Vulnerability</p>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • Increasing hostility/turmoil directed at the energy industry • Increasing political turmoil at all levels of government • Social discord from the COVID-19 and social media • Funding of extreme groups by “Dark Money” from billionaires/crowd-funding websites • Limited law enforcement in rural areas of county • Inadequate mental health services in county/state 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • Sparse population and rural area of the state/country • County not located near a major metropolitan population, international airport, stadiums, or significant tourist attraction • Lack of major television station in Wells County • No interstate highway • Wells County Sheriff’s Office • N.D. State and Local Intelligence Center (SLIC)

Table 4.1.2.2 – Wells County, North Dakota Civil Disturbance Risk Assessment – Continued

Vulnerability	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • U.S. Highway 52; ND Highways 3, 15, and 200 • BNSF and CP Railroad infrastructure • Tier II Sites • Energy Pipelines • Communications infrastructure (12 cell phone towers, two N.D. State Radio Repeaters) and industrial-scale electric transmission 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • Wells County Sheriff’s Office • N.D. State and Local Intelligence Center (SLIC) • Wells County Courthouse, KTL Building, St. Aloisius Hospital & Medical Center, Harvey City Hall/Police Station, Wells County Public Health, and public schools have security camera surveillance systems • Wells County Courthouse and public schools have access control systems
	<p>Capability</p> <ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address civil disturbance. 	

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Data Limitations and Other Key Documents

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

This plan incorporates data from the following documents and information herein will be used in future updates.

- 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan, Civil Disturbance Annex
- North Dakota State Disaster Recovery Plan
- North Dakota State Preparedness Report (SPR)
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)
- Wells County Evacuation Plan through Wells County Emergency Management
- Wells County Local Emergency Operations Plan (LEOP)
- Wells County Mass Care Plan through Wells County Emergency Management
- Wells County Shelter Plan through Wells County Emergency Management
- Wells County Threat and Hazard Identification and Risk Assessment (THIRA)

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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.

Seasonal Pattern	None. More likely during political unrest or social discord. Extreme winter weather can limit or eliminate activity altogether.
Duration	Minutes/hours/days/weeks/months/potentially a year or more.
Speed of Onset	Little to no warning or several days/weeks.
Location	<p>Total geographic extent of Eddy County, North Dakota and Wells County, North Dakota. Most likely targeting information databases at critical facilities and infrastructure such as government facilities (city halls, courthouses, fire halls, public works), medical facilities, major employers, roads/highways and railroad infrastructure, or chemical and oil and gas infrastructure such as pipelines and Tier II Sites.</p> <p><u>Eddy County</u></p> <ul style="list-style-type: none"> • Alliance Natural Gas Pipeline • Burlington Northern Santa Fe (BNSF) Railroad • Cenex Non-HVL Products Pipeline • Eddy County Courthouse • Luther Home-Good Shepherd • New Rockford Public School • N.D. Highways 9, 15, 20, 200 • Red River Valley & Western (RRV&W) Railroad • Tier II Sites • U.S. Highways 52 and 281 <p><u>Wells County</u></p> <ul style="list-style-type: none"> • Alliance Natural Gas Pipeline • Burlington Northern Santa Fe (BNSF) Railroad • Canadian Pacific (CP) Railway • Cenex Non-HVL Products Pipeline • Fessenden-Bowdon Public School • Fessenden Coop • Harvey Dam • Harvey Municipal Airport • Harvey Public School • Kinder Morgan Propane Pipeline

	<ul style="list-style-type: none">• N.D. Highways 3, 15, 30, 200• St. Aloisius Hospital and Medical Center• Tier II Sites• U.S. Highway 52• Wells County Courthouse• Wells County Fairgrounds/Festival Hall
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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>

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4.2.1.1 Criminal, Terrorist, or Nation/State Attack – Eddy County, North Dakota

History

The following information on incidents of criminal, terrorist, or nation/state attack in Eddy County was provided by the Eddy County Sheriff's Office, Eddy County Emergency Management, and the 2018 N.D. Enhanced Mitigation Mission Area Operations Plan.

- February 2023. A homicide occurred in the city of Sheyenne.
- 2015. One murder occurred in the city of New Rockford as an active-shooter targeted a wedding dance at the Eagle's Club. Another murder occurred at a private residence near the intersection of 83rd Ave Eddy County Highway 1 near unincorporated Warwick.
- In response to the terrorist attacks on September 11, 2001, public schools in Eddy County implemented controlled access by only allowing all students, staff, and visitors to enter and exit through one entrance.
- High-speed pursuits, domestic assaults, theft/burglary and drug activity are the most commonplace type of crimes occurring in Eddy County.

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 Eddy County or nearby. Table 4.2.1.1 shows vandalism and theft claims paid on critical facilities insured by the state in Eddy County between 1989 and 2018.

Table 4.2.1.1 – 1989 to 2018 Eddy County, North Dakota Vandalism and Theft Claims Paid on Critical Facilities Insured by State

Jurisdiction	State Agencies	Adjutant General	State Universities	Local Governments	School Districts	Total
Eddy County	\$0.00	\$0.00	\$0.00	\$4,390.00	\$11,544.00	\$11,983.00

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 zero paid to state agencies, the adjutant general, and state universities. Approximately \$4,390.00 and \$11,544.00 had been paid to local governments and school districts in Eddy County for vandalism and theft claims paid, respectively.

There have been no declared disasters or emergencies pertaining to a criminal, terrorist, or nation/state attack in Eddy County.

Probability

The probability of a hazard or threat is how likely 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, Eddy County was the 28th most populous county in North Dakota with 3.8 persons per square mile.

During jurisdictional meetings, 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 involving active shooters over the past three decades.

The Eddy County Courthouse and public schools have implemented access control measures and security camera surveillance systems.

Profile meeting participants ranked the probability of criminal, terrorist, or nation/state attack as “possible,” meaning there is a 25 percent probability in the next year of an incident. It is likely a civil disturbance will occur at some point in the future in Eddy County and/or in North Dakota.

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. Extent/magnitude of a criminal, terrorist or nation/state attack can vary from an extreme event such as one that affects the national or agricultural economy or requires deployment of military personnel and drafting of soldiers, or smaller extent/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 extent and/or magnitude.

Energy. 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 on 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.

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 casualties/fatalities. With the economy of Eddy County largely based on agriculture, an incident involving the agriculture sector or at a manufacturing facility has the potential to be disastrous and large in extent/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.

Infrastructure. The most likely scenario would be targeting the drinking/potable water systems in incorporated jurisdictions. An attack of this nature could result in widespread illness or even mass casualties/fatalities.

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. With the lack of a major interstate, but presence of U.S. Highways 52 and 281 traversing Eddy County, and BNSR and RRVW railroad infrastructure, the extent/magnitude would be minor if an incident involving the local road system, or major if involving a national highway or railroad, or both.

Risk Assessment

Table 4.2.1.2 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 4.2.1.2 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 4.2.1.2 – Eddy County, North Dakota Criminal, Terrorist or Nation/State Attack Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Eddy County	3	2	2	3	1	9
City of New Rockford	3	2	2	3	1	9
City of Sheyenne	4	2	1	2	1	8

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

Table 4.2.1.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of criminal, terrorist, or nation/state attack in Eddy 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 the county and incorporated jurisdictions, such as the Eddy County Courthouse, public schools, or buildings supporting emergency services such as ambulance and fire 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. Critical facilities such as the Eddy County Courthouse, Eddy County Highway Department shops, Luther Home-Good Shepherd, ambulance and fire halls, and infrastructure such as electric power/substations, water/wastewater facilities, and Tier II sites are vulnerable to the threat. **In Eddy County, four cell phone towers and BNSF and RRV&W railroad are critical infrastructure vulnerable to criminal, terrorist, or nation/state attack.**

A summary of critical facilities and infrastructure is provided in Chapter 3, Profile and Inventory.

Table 4.2.1.3 – Eddy County, North Dakota Criminal, Terrorist or Nation/State Attack Risk Assessment

<p>Impact</p>	<ul style="list-style-type: none"> • Blocked Roads • Delayed Emergency Response • HAZMAT Release • Human Injury/Death & Mass Casualties/Fatalities • Increased Public Safety Runs • Loss of Economy • Loss of Communication Infrastructure • Loss/Overcrowded Medical Facilities • Loss of Potable Water 	<ul style="list-style-type: none"> • Loss of Power • Disruption of services to maintain economic activity/daily life • Harm to reputation of the county as a safe place to reside causing damage to economic growth and decline in school enrollments • Potential exodus of people resulting in permanent population loss • Shutting down of regional commerce indefinitely if an attack targets transportation – specifically bridges and railroads • Potential for mass casualties or widespread sickness if water or wastewater infrastructure was targeted
<p>Frequency</p>	<ul style="list-style-type: none"> • No incidents have occurred in Eddy County 	
<p>Likelihood</p>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> • Increasing hostility/turmoil directed at the energy industry • Increasing political turmoil at all levels of government • Social discord from the COVID-19 and social media • U.S. Highways 52 and 281, and ND Highways 9, 15, and 20 • BNSF and RRVW Railroad infrastructure • Tier II Sites • Communications infrastructure (four cell phone towers) 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> • Sparse population and rural area of the state/country • County not located near a major metropolitan population, international airport, stadiums, or significant tourist attraction • Lack of major television station in Eddy County • No interstate highway • Eddy County Sheriff’s Office • N.D. State and Local Intelligence Center (SLIC)
<p>Vulnerability</p>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • Increasing hostility/turmoil directed at the energy industry • Increasing political turmoil at all levels of government • Social discord from the COVID-19 and social media • Funding of extreme groups by “Dark Money” from billionaires/crowd-funding websites • Limited law enforcement in rural areas of county • Inadequate mental health services in county/state 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • Sparse population and rural area of the state/country • County not located near a major metropolitan population, international airport, stadiums, or significant tourist attraction • Lack of major television station in Eddy County • No interstate highway • Eddy County Sheriff’s Office • N.D. State and Local Intelligence Center (SLIC)

Table 4.2.1.3 – Eddy County, North Dakota Criminal, Terrorist or Nation/State Attack Risk Assessment – Continued

Vulnerability	<u>More Vulnerable</u> <ul style="list-style-type: none"> • U.S. Highways 52 and 281, and ND Highways 9, 15, and 20 • BNSF and RRVW Railroad infrastructure • Tier II Sites • Communications infrastructure (four cell phone towers) 	<u>Less Vulnerable</u> <ul style="list-style-type: none"> • Eddy County Sheriff’s Office • N.D. State and Local Intelligence Center (SLIC) • Civic participation by location population in neighborhood watch-like activities reporting suspicious behavior • Eddy County Courthouse and the public schools have cameras and door locking systems
	Capability <ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address criminal, terrorist or nation/state attack. 	

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Vulnerabilities to New and Future Development

Criminal, terrorist, or nation/state attacks are 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 is 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, 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. Also, the anticipated construction of wind energy infrastructure in the county will also increase the vulnerability of criminal, terrorist, or nation/state attack.

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 and Other Key Documents

The probability and vulnerability 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 (DAPL) protest in the south-central portion of the state.

This plan incorporates data from the following documents and information herein will be used in future updates.

- 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)
- Eddy County Evacuation Plan through Eddy County Emergency Management
- Eddy County Local Emergency Operations Plan (LEOP)
- Eddy County Mass Care Plan through Eddy County Emergency Management
- Eddy County Shelter Plan through Eddy County Emergency Management
- Eddy County Threat and Hazard Identification and Risk Assessment (THIRA)
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan, Civil Disturbance Annex
- North Dakota State Disaster Recovery Plan

- North Dakota State Preparedness Report (SPR)
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

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4.2.2 Criminal, Terrorist or Nation/State Attack – Wells County, North Dakota

History

The following information on incidents of criminal, terrorist, or nation/state attack in Wells County was provided by the Wells County Sheriff's Office, Wells County Emergency Management, and the 2018 N.D. Enhanced Mitigation Mission Area Operations Plan.

- In response to the terrorist attacks on September 11, 2001, public schools in Wells County implemented controlled access by only allowing all students, staff, and visitors to enter and exit through one entrance.
- High-speed pursuits, domestic assaults, theft/burglary and drug activity are the most commonplace type of crimes occurring in Wells County.
- 2015. A murder occurred south of unincorporated Chaseley in rural Wells County.

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 Wells County or nearby. Table 4.2.2.1 shows vandalism and theft claims paid on critical facilities insured by the state in Wells County between 1989 and 2018.

Table 4.2.2.1 – 1989 to 2018 Wells County, North Dakota Vandalism and Theft Claims Paid on Critical Facilities Insured by State

Jurisdiction	State Agencies	Adjutant General	State Universities	Local Governments	School Districts	Total
Wells County	\$0.00	\$0.00	\$0.00	\$264.00	\$8,514.00	\$8,778.00

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 zero paid to state agencies, the adjutant general, and state universities. Approximately \$264.00 and \$8,514.00 had been paid to local governments and school districts in Wells County for vandalism and theft claims paid, respectively.

There have been no declared disasters or emergencies pertaining to a criminal, terrorist, or nation/state attack in Wells County.

Probability

The probability of a hazard or threat is how likely 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, Wells County was the 30th most populous county in North Dakota with 3.3 persons per square mile.

During jurisdictional meetings, 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 involving active shooters over the past three decades.

The Wells County Courthouse, KTL Building, Fessenden-Bowdon Public School, Harvey City Hall/Police Station, Harvey Public School, St. Aloisius Hospital & Medical Center, and ambulance and fire halls have implemented access control measures and security camera surveillance systems.

Profile meeting participants ranked the probability of criminal, terrorist, or nation/state attack as “possible,” meaning there is a 25 percent probability in the next year of an incident. It is likely a civil disturbance will occur at some point in the future in Wells County and/or in North Dakota.

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. Extent/magnitude of a criminal, terrorist or nation/state attack can vary from an extreme event such as one that affects the national or agricultural economy or requires deployment of military personnel and drafting of soldiers, or smaller extent/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 extent and/or magnitude.

Energy. 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 on 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.

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 casualties/fatalities. With the economy of Wells County largely based on agriculture, an incident involving the agriculture sector or at a manufacturing facility has the potential to be disastrous and large in extent/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.

Infrastructure. The most likely scenario would be targeting the drinking/potable water systems in incorporated jurisdictions. An attack of this nature could result in widespread illness or even mass casualties/fatalities.

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. With the lack of a major interstate, but presence of U.S. Highway 52 traversing Wells County, and BNSF and CP railroad infrastructure, the extent/magnitude would be minor if an incident involving the local road system, or major if involving a national highway or railroad, or both.

Risk Assessment

Table 4.2.2.2 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 4.2.2.2 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 4.2.2.2 – Wells County, North Dakota Criminal, Terrorist or Nation/State Attack Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Wells County	4	1	2	3	1	9
City of Bowdon	2	1	2	2	1	6
City of Cathay	2	1	2	2	1	6
City of Fessenden	3	1	2	3	1	8
City of Hamberg	2	1	2	2	1	6
City of Harvey	3	1	2	3	1	8
City of Hurdsfield	2	1	2	2	1	6
City of Sykeston	3	1	2	2	1	6

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

Table 4.2.2.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of criminal, terrorist, or nation/state attack in Wells 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 the county and incorporated jurisdictions, such as the Wells County Courthouse, KTL Building, Wells County Highway Department shops, St. Aloisius Hospital & Medical Center, Fessenden-Bowdon Public School, Harvey City Hall/Police Station, Harvey Public School, or buildings supporting emergency services such as ambulance and fire halls, would be the most vulnerable, 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. Critical facilities such Wells County Courthouse, KTL Building, Wells County Highway Department shops, St. Aloisius Hospital & Medical Center, Fessenden-Bowdon Public School, Harvey Public School, ambulance and fire halls, and infrastructure such as electric power/substations, water/wastewater facilities, and Tier II sites are vulnerable to the threat. In addition,

Wells County has 12 cell phone towers, two N.D. State Radio Repeater Towers, and three energy pipelines.

A summary of critical facilities and infrastructure is provided in Chapter 3, Profile and Inventory.

Vulnerabilities to New and Future Development

Criminal, terrorist, or nation/state attacks are 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 is 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, 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 and Other Key Documents

The probability and vulnerability 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 (DAPL) protest in the south-central portion of the state.

This plan incorporates data from the following documents and information herein will be used in future updates.

- 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan, Civil Disturbance Annex
- North Dakota State Disaster Recovery Plan
- North Dakota State Preparedness Report (SPR)
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)
- Wells County Evacuation Plan through Wells County Emergency Management

- Wells County Local Emergency Operations Plan (LEOP)
- Wells County Mass Care Plan through Wells County Emergency Management
- Wells County Shelter Plan through Wells County Emergency Management
- Wells County Threat and Hazard Identification and Risk Assessment (THIRA)

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Table 4.2.2.3 – Wells County, North Dakota Criminal, Terrorist or Nation/State Attack Risk Assessment

<p>Impact</p>	<ul style="list-style-type: none"> Blocked Roads Delayed Emergency Response HAZMAT Release Human Injury/Death & Mass Casualties/Fatalities Increased Public Safety Runs Loss of Economy Loss of Communication Infrastructure Loss/Overcrowded Medical Facilities Loss of Potable Water 	<ul style="list-style-type: none"> Loss of Power Disruption of services to maintain economic activity/daily life Harm to reputation of the county as a safe place to reside causing damage to economic growth and decline in school enrollments Potential exodus of people resulting in permanent population loss Shutting down of regional commerce indefinitely if an attack targets transportation – specifically bridges and railroads Potential for mass casualties or widespread sickness if water or wastewater infrastructure was targeted
<p>Frequency</p>	<ul style="list-style-type: none"> No incidents have occurred in Wells County 	<ul style="list-style-type: none"> 10+ years since the last homicide in Wells County Annual occurrences of vandalism of homes and cars, and ATMs
<p>Likelihood</p>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> Increasing hostility/turmoil directed at the energy industry Increasing political turmoil at all levels of government Social discord from the COVID-19 and social media U.S. Highway 52; ND Highways 3, 15, and 200 BNSF and CP Railroad infrastructure Tier II Sites Energy Pipelines Communications infrastructure (12 cell phone towers, two N.D. State Radio Repeaters) and industrial-scale electric transmission 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> Sparse population and rural area of the state/country County not located near a major metropolitan population, international airport, stadiums, or significant tourist attraction Lack of major television station in Wells County No interstate highway Wells County Sheriff’s Office N.D. State and Local Intelligence Center (SLIC) Wells County Courthouse, KTL Building, St. Aloisius Hospital & Medical Center, Harvey City Hall/Police Station, and public schools have security camera surveillance systems and door locking systems
<p>Vulnerability</p>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> Increasing hostility/turmoil directed at the energy industry Increasing political turmoil at all levels of government Social discord from the COVID-19 and social media Funding of extreme groups by “Dark Money” from billionaires/crowd-funding websites 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> Sparse population and rural area of the state/country County not located near a major metropolitan population, international airport, stadiums, or significant tourist attraction Lack of major television station in Wells County No interstate highway Wells County Sheriff’s Office

Table 4.2.2.3 – Wells County, North Dakota Criminal, Terrorist or Nation/State Attack Risk Assessment – Continued

Vulnerability	<u>More Vulnerable</u>	<u>Less Vulnerable</u>
	<ul style="list-style-type: none"> • Limited law enforcement in rural areas of county • Inadequate mental health services in county/state • U.S. Highway 52; ND Highways 3, 15, and 200 • BNSF and CP Railroad infrastructure • Tier II Sites • Energy Pipelines • Communications infrastructure (12 cell phone towers, two N.D. State Radio Repeaters) and industrial-scale electric transmission 	<ul style="list-style-type: none"> • N.D. State and Local Intelligence Center (SLIC) • Civic participation by location population in neighborhood watch-like activities reporting suspicious behavior • Wells County Courthouse, Fessenden-Bowdon Public School, Harvey-Wells County Public School, and ambulance and fire halls have cameras and door locking systems
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address criminal, terrorist or nation/state attack. 	

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4.3 Cyberattack

An attack or hijack of digital/technological information and/or 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 Eddy County, North Dakota and Wells County, North Dakota.

Seasonal Pattern	None. More frequent during Christmas/holidays and after final testing at schools. Increased activity is experienced during other hazardous events such as a pandemic (COVID-19).
Duration	Varies based on the type of attack method used. Seconds/minutes/hours/days/weeks/months/potentially a year or more.
Speed of Onset	Little to no warning or up to several days/weeks.
Location	<p>Total geographic extent of Eddy County, North Dakota and Wells County, North Dakota. Most likely targeting information databases at critical facilities and infrastructure such as government facilities (city halls, courthouses, public works), medical facilities, major employers, or chemical or oil and gas infrastructure.</p> <p><u>Eddy County</u></p> <ul style="list-style-type: none"> • Eddy County Courthouse • Lutheran Home of the Good Shepherd • New Rockford-Sheyenne Public School • New Rockford Water Plant <p><u>Wells County</u></p> <ul style="list-style-type: none"> • Fessenden-Bowdon Public School • Fessenden Coop • Harvey Public School • St. Aloisius Hospital and Medical Center • Wells County Courthouse

For more information regarding cyberattack please reference the **2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)**. The plan can be accessed by following the link:

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

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

4.3.1 Cyberattack – Eddy County, North Dakota

History

According to information technology support for Eddy County, North Dakota, no cyberattacks have been executed on the digital/technological infrastructure at the Eddy County Courthouse in New Rockford.

According to the New Rockford Public School, no cyberattacks have been executed on digital/technological infrastructure at the school.

2018 N.D. Enhanced Mitigation MAOP

According to the 2018 N.D. Enhanced Mitigation MAOP, the following cyberattack events occurred either in Eddy 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, and
- 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;
- Drivers licenses could not be issued or renewed;
- Payments to vendors were delayed;
- Schools closed;
- Students grades were lost, and
- Tax payment deadlines had to be extended.

There have been no declared disasters or emergencies pertaining to cyberattack in Eddy 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 is very high.

Profile meeting participants ranked the probability of cyberattack as "highly likely," meaning 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 extent/magnitude of a cyberattack can vary from a loss of personal information such as an individual's pictures and music to high extent/magnitude events like 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.
- Lloyds 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 4.3.1.1 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 4.3.1.1 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 4.3.1.1 – Eddy County, North Dakota Cyberattack Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Eddy County	4	2	4	3	2	11
City of New Rockford	4	2	4	3	2	11
City of Sheyenne	3	1	3	3	1	9

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

Table 4.3.1.2 provides information on the specific impact, frequency, likelihood, vulnerability, and capability of cyberattack in Eddy 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 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 the county and incorporated jurisdictions, such as the Eddy County Courthouse, care centers, state and federal agencies located in Eddy County, and public schools would be the most vulnerable to a cyberattack.

A summary of publicly-owned buildings and property in Eddy 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. 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, the vulnerability to from the threat to public works infrastructure in incorporated jurisdictions such as drinking/potable water and wastewater treatment systems will increase with the installation of digital water meters and 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 and Other Key Documents

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.

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)
- Eddy County Local Emergency Operations Plan (LEOP), Cyberattack Annex
- Eddy County Threat and Hazard Identification and Risk Assessment (THIRA)
- New Rockford Public School Cyberattack Response Plan
- North Dakota Continuity of Operations Plan
- North Dakota Cybersecurity Framework (NDCSF)
- North Dakota Emergency Operations Plan, Cyberattack Annex
- NDIT Cyberattack Incident Response Plan - includes Eddy County systems
- 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)

Table 4.3.1.2 – Eddy County, North Dakota Cyberattack Risk Assessment

<p>Impact</p>	<ul style="list-style-type: none"> • Delayed Emergency Response • HAZMAT Release • Increased Public Safety Runs • Government Interruptions • Loss of Communication Systems – Loss of 9-1-1 • Loss of Economy • Loss of Potable Water • Loss of Power • Mass Casualties/Fatalities • Loss/Overcrowded Medical Facilities <ul style="list-style-type: none"> • Increased and unforeseen public and private costs due to response and recovery requirements • Loss of websites and information for critical facilities • Shutting down of infrastructure systems resulting in loss of economy activity as technological systems are used in nearly all industries, both public and private • Targeting of emergency services personnel • Loss of public confidence in city and county government • Loss of archived data and records 		
<p>Frequency</p>	<ul style="list-style-type: none"> • 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. • 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 		
<p>Likelihood</p>	<table border="0" style="width: 100%;"> <tr> <td style="vertical-align: top; width: 50%;"> <p><u>More Likely</u></p> <ul style="list-style-type: none"> • Digital economy with nation-wide banks and other institutions electronically linked to the state and county • Growing automation of daily tasks • Social media • Technological systems used in nearly all industries • Eddy County lacks ESET Endpoint Security which adds another layer of protection on all workstations and servers and renews every year </td> <td style="vertical-align: top; width: 50%;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> • NDIT has a Cyberattack Incident Response Plan that covers Eddy County systems • State installed larger firewall – has a direct impact on county functions • Ongoing investment in preventative education and enhanced countermeasures • NDIT and NDSLIC • Redundancies in state and county technology and power systems • Eddy County is fully migrated over to NDIT’s Cortex XDR security package and Extreme Switch Juniper Firewall/Router and replaced switches in 2020 • Eddy County installed ESET Endpoint Security which adds another layer of protection on all workstations and servers and renews every year • New Rockford Public School has firewalls through NDIT </td> </tr> </table>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> • Digital economy with nation-wide banks and other institutions electronically linked to the state and county • Growing automation of daily tasks • Social media • Technological systems used in nearly all industries • Eddy County lacks ESET Endpoint Security which adds another layer of protection on all workstations and servers and renews every year 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> • NDIT has a Cyberattack Incident Response Plan that covers Eddy County systems • State installed larger firewall – has a direct impact on county functions • Ongoing investment in preventative education and enhanced countermeasures • NDIT and NDSLIC • Redundancies in state and county technology and power systems • Eddy County is fully migrated over to NDIT’s Cortex XDR security package and Extreme Switch Juniper Firewall/Router and replaced switches in 2020 • Eddy County installed ESET Endpoint Security which adds another layer of protection on all workstations and servers and renews every year • New Rockford Public School has firewalls through NDIT
<p><u>More Likely</u></p> <ul style="list-style-type: none"> • Digital economy with nation-wide banks and other institutions electronically linked to the state and county • Growing automation of daily tasks • Social media • Technological systems used in nearly all industries • Eddy County lacks ESET Endpoint Security which adds another layer of protection on all workstations and servers and renews every year 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> • NDIT has a Cyberattack Incident Response Plan that covers Eddy County systems • State installed larger firewall – has a direct impact on county functions • Ongoing investment in preventative education and enhanced countermeasures • NDIT and NDSLIC • Redundancies in state and county technology and power systems • Eddy County is fully migrated over to NDIT’s Cortex XDR security package and Extreme Switch Juniper Firewall/Router and replaced switches in 2020 • Eddy County installed ESET Endpoint Security which adds another layer of protection on all workstations and servers and renews every year • New Rockford Public School has firewalls through NDIT 		

Table 4.3.1.2 – Eddy County, North Dakota Cyberattack Risk Assessment - Continued

Vulnerability	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • All state and local governments, businesses, and organizations/institutions that use digital/technological systems • Growing automation of daily tasks in individual’s lives, and private and public sectors • Social media • Technological systems used in nearly all industries • Elderly population relying largely on landlines for communication purposes, remote medical care and equipment monitoring 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • NDIR has a Cyberattack Incident Response Plan that covers Eddy County systems • State installed larger firewall after DAPL protest • Ongoing investment in preventative education and enhanced countermeasures • NDIR and NDSLIC • 66th 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. NDIR setting strategies and advising all branches of government for cyberattack and counter measures – signed on April 12, 2021 • Redundancies in state and county technology and power systems • High regulation of banking and other industries to mitigate cyberattacks • K20W Initiative – training school-aged kids on cyber education • Eddy County is fully migrated over to NDIR’s Cortex XDR security package and replaced switches in 2020 • Eddy County installed ESET Endpoint Security which adds another layer of protection on all workstations and servers and renews every year • New Rockford Public School has firewalls through NDIR
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address cyberattack • New Rockford Public School Technology Plan (includes a statement on cybersecurity) • NDIR Cyberattack Incident Response Plan - includes Eddy County systems • Eddy County Local Emergency Operations Plan, Cyberattack Response Plan 	

4.3.2 Cyberattack – Wells County, North Dakota

History

According to information technology support for Wells County, North Dakota, no cyberattacks have been executed on the digital/technological infrastructure at the Wells County Courthouse in Fessenden.

According to the Fessenden-Bowdon Public School and Harvey Public School, no cyberattacks have been executed on digital/technological infrastructure at the school.

2018 N.D. Enhanced Mitigation MAOP

According to the 2018 N.D. Enhanced Mitigation MAOP, the following cyberattack events occurred either in Wells 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, and
- 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;
- Drivers licenses could not be issued or renewed;
- Payments to vendors were delayed;
- Schools closed;
- Students grades were lost, and
- Tax payment deadlines had to be extended.

There have been no declared disasters or emergencies pertaining to cyberattack in Wells 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 is very high.

Profile meeting participants ranked the probability of cyberattack as "highly likely," meaning 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 extent/magnitude of a cyberattack can vary from a loss of personal information such as an individual's pictures and music to high extent/magnitude events like 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.
- Lloyds 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 4.3.1.1 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 4.3.1.1 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 4.3.1.1 – Wells County, North Dakota Cyberattack Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Wells County	4	3	4	4	3	12
City of Bowdon	3	2	2	2	1	8
City of Cathay	3	2	2	2	1	8
City of Fessenden	4	3	4	4	3	12
City of Hamberg	3	2	2	2	1	8
City of Harvey	4	3	4	4	3	12
City of Hurdsfield	3	2	2	2	1	8
City of Sykeston	3	2	2	2	1	8

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

Table 4.3.1.2 provides information on the specific impact, frequency, likelihood, vulnerability, and capability of cyberattack in Wells 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 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 the county and incorporated jurisdictions, such as the Wells County Courthouse, care centers, state and federal agencies located in Wells County, and public schools would be the most vulnerable to a cyberattack.

A summary of publicly-owned buildings and property in Wells 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. 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, the vulnerability to from the threat to public works infrastructure in incorporated jurisdictions such as drinking/potable water and wastewater treatment systems will increase with the installation of digital water meters and 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.

Table 4.3.2.2 – Wells County, North Dakota Cyberattack Risk Assessment

<p>Impact</p>	<ul style="list-style-type: none"> • Delayed Emergency Response • HAZMAT Release • Increased Public Safety Runs • Government Interruptions • Loss of Communication Systems – Loss of 9-1-1 • Loss of Economy • Loss of Potable Water • Loss of Power • Mass Casualties/Fatalities • Loss/Overcrowded Medical Facilities <ul style="list-style-type: none"> • Increased and unforeseen public and private costs due to response and recovery requirements • Loss of websites and information for critical facilities • Shutting down of infrastructure systems resulting in loss of economy activity as technological systems are used in nearly all industries, both public and private • Targeting of emergency services personnel • Loss of public confidence in city and county government • Loss of archived data and records 		
<p>Frequency</p>	<ul style="list-style-type: none"> • 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. • 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 		
<p>Likelihood</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"> • Digital economy with nation-wide banks and other institutions electronically linked to the state and county • Growing automation of daily tasks • Social media • Technological systems used in nearly all industries • Wells County lacks ESET Endpoint Security which adds another layer of protection on all workstations and servers and renews every year </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Likely</u></p> <ul style="list-style-type: none"> • NDIT has a Cyberattack Incident Response Plan that covers Wells County systems • State installed larger firewall – has a direct impact on county functions • Ongoing investment in preventative education and enhanced countermeasures • NDIT and NDSLIC • Redundancies in state and county technology and power systems • Wells County is fully migrated over to NDIT’s Cortex XDR security package and Extreme Switch Juniper Firewall/Router and replaced switches in 2020 • Wells County installed ESET Endpoint Security which adds another layer of protection on all workstations and servers and renews every year • Fessenden-Bowdon Public School has firewalls through NDIT • Harvey Public School has firewalls through NDIT </td> </tr> </table>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> • Digital economy with nation-wide banks and other institutions electronically linked to the state and county • Growing automation of daily tasks • Social media • Technological systems used in nearly all industries • Wells County lacks ESET Endpoint Security which adds another layer of protection on all workstations and servers and renews every year 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> • NDIT has a Cyberattack Incident Response Plan that covers Wells County systems • State installed larger firewall – has a direct impact on county functions • Ongoing investment in preventative education and enhanced countermeasures • NDIT and NDSLIC • Redundancies in state and county technology and power systems • Wells County is fully migrated over to NDIT’s Cortex XDR security package and Extreme Switch Juniper Firewall/Router and replaced switches in 2020 • Wells County installed ESET Endpoint Security which adds another layer of protection on all workstations and servers and renews every year • Fessenden-Bowdon Public School has firewalls through NDIT • Harvey Public School has firewalls through NDIT
<p><u>More Likely</u></p> <ul style="list-style-type: none"> • Digital economy with nation-wide banks and other institutions electronically linked to the state and county • Growing automation of daily tasks • Social media • Technological systems used in nearly all industries • Wells County lacks ESET Endpoint Security which adds another layer of protection on all workstations and servers and renews every year 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> • NDIT has a Cyberattack Incident Response Plan that covers Wells County systems • State installed larger firewall – has a direct impact on county functions • Ongoing investment in preventative education and enhanced countermeasures • NDIT and NDSLIC • Redundancies in state and county technology and power systems • Wells County is fully migrated over to NDIT’s Cortex XDR security package and Extreme Switch Juniper Firewall/Router and replaced switches in 2020 • Wells County installed ESET Endpoint Security which adds another layer of protection on all workstations and servers and renews every year • Fessenden-Bowdon Public School has firewalls through NDIT • Harvey Public School has firewalls through NDIT 		

Table 4.3.1.2 – Wells County, North Dakota Cyberattack Risk Assessment - Continued

Vulnerability	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • All state and local governments, businesses, and organizations/institutions that use digital/technological systems • Growing automation of daily tasks in individual’s lives, and private and public sectors • Social media • Technological systems used in nearly all industries • Elderly population relying largely on landlines for communication purposes, remote medical care and equipment monitoring 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • NDIR has a Cyberattack Incident Response Plan that covers Wells County systems • State installed larger firewall after DAPL protest • Ongoing investment in preventative education and enhanced countermeasures • NDIR and NDSLIC • 66th 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. NDIR setting strategies and advising all branches of government for cyberattack and counter measures – signed on April 12, 2021 • Redundancies in state and county technology and power systems • High regulation of banking and other industries to mitigate cyberattacks • K20W Initiative – training school-aged kids on cyber education • Wells County is fully migrated over to NDIR’s Cortex XDR security package and replaced switches in 2020 • Wells County installed ESET Endpoint Security which adds another layer of protection on all workstations and servers and renews every year • Fessenden-Bowdon Public School has firewalls through NDIR • Harvey Public School has firewalls through NDIR
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address cyberattack • Fessenden-Bowdon Public School Technology Plan (includes a statement on cybersecurity) • NDIR Cyberattack Incident Response Plan - includes Wells County systems • Wells County Local Emergency Operations Plan, Cyberattack Response Plan 	

Data Limitations and Other Key Documents

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.

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)
- Fessenden-Bowdon Public School Cyberattack Response Plan
- Harvey-Wells County Public School Cyberattack Response Plan
- North Dakota Continuity of Operations Plan
- North Dakota Cybersecurity Framework (NDCSF)
- North Dakota Emergency Operations Plan, Cyberattack Annex
- NDIT Cyberattack Incident Response Plan - includes Wells County systems
- 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)
- Wells County Cyberattack Response Plan
- Wells County Local Emergency Operations Plan, Cyberattack Annex
- Wells County Threat and Hazard Identification and Risk Assessment (THIRA)

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.

Seasonal Pattern	None. More of a risk during spring flood season.
Duration	Minutes/Hours/Days/Weeks – dependent on respective inundation area
Speed of Onset	Minutes to Hours
Location	<u>Eddy County</u> : Sheyenne Dam and Warwick Dam <u>Wells County</u> : Harvey Dam and Sykeston Dam Inundation areas for all other dams specific to the corresponding geography of the local area and critical facilities and infrastructure.

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 (NDCC) 61-03-25, emergency action plans are required for all dams classified as medium/significant-or high-hazard dams in North Dakota. NDCC 61-03-25 states “The owner of a high-hazard or medium-hazard dam shall develop, periodically test, and update an emergency action plan to be implemented if there is an emergency involving the dam. The emergency action plan and any subsequent updates must be submitted to the department for approval.”

For more information regarding dam failure please reference the **2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)**. The plan can be accessed by following the link:

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

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

4.4.1 Dam Failure – Eddy County, North Dakota

History

Per the National Performance of Dams Program, Stanford University, the following dam incidents were reported for Eddy County.

List of Dams – Eddy County

Per information provided by the N.D. Dept. of Water Resources, there are approximately 17 dams in Eddy County. Due to homeland security purposes, limited information is shown regarding high and medium hazard dams in Eddy County. Additional information can be accessed through the National Inventory of Dams website or by contacting the N.D. Dept. of Water Resources or Eddy County Emergency Management. Per the 2018 N.D. Enhanced Mitigation MAOP, there are no high-hazard or medium hazard dams physically located in Eddy County.

Probability

The probability of a hazard or threat is how likely it is it will happen. Based on the dam failure history for Eddy County and the risk assessment conducted by the stakeholder meeting, the probability of dam failure is “unlikely.” The 2018 N.D. Enhanced Mitigation MAOP lists Eddy County as a low vulnerability jurisdiction for dam failure.

Table 4.4.1.1 – 2022 Eddy County, North Dakota Dams with Emergency Action Plans (EAPs)

Dam	Authorized Purpose	Classification	Location	Area(s) of Inundation
Sheyenne Dam	Recreation	9.0 feet high 900.0 feet long	1 mile north of the city and west of U.S. Highway 281	<ul style="list-style-type: none"> U.S. Highway 281 Agriculture/farmland

Source(s): N.D. Dept. of Water Resources

Extent/Magnitude

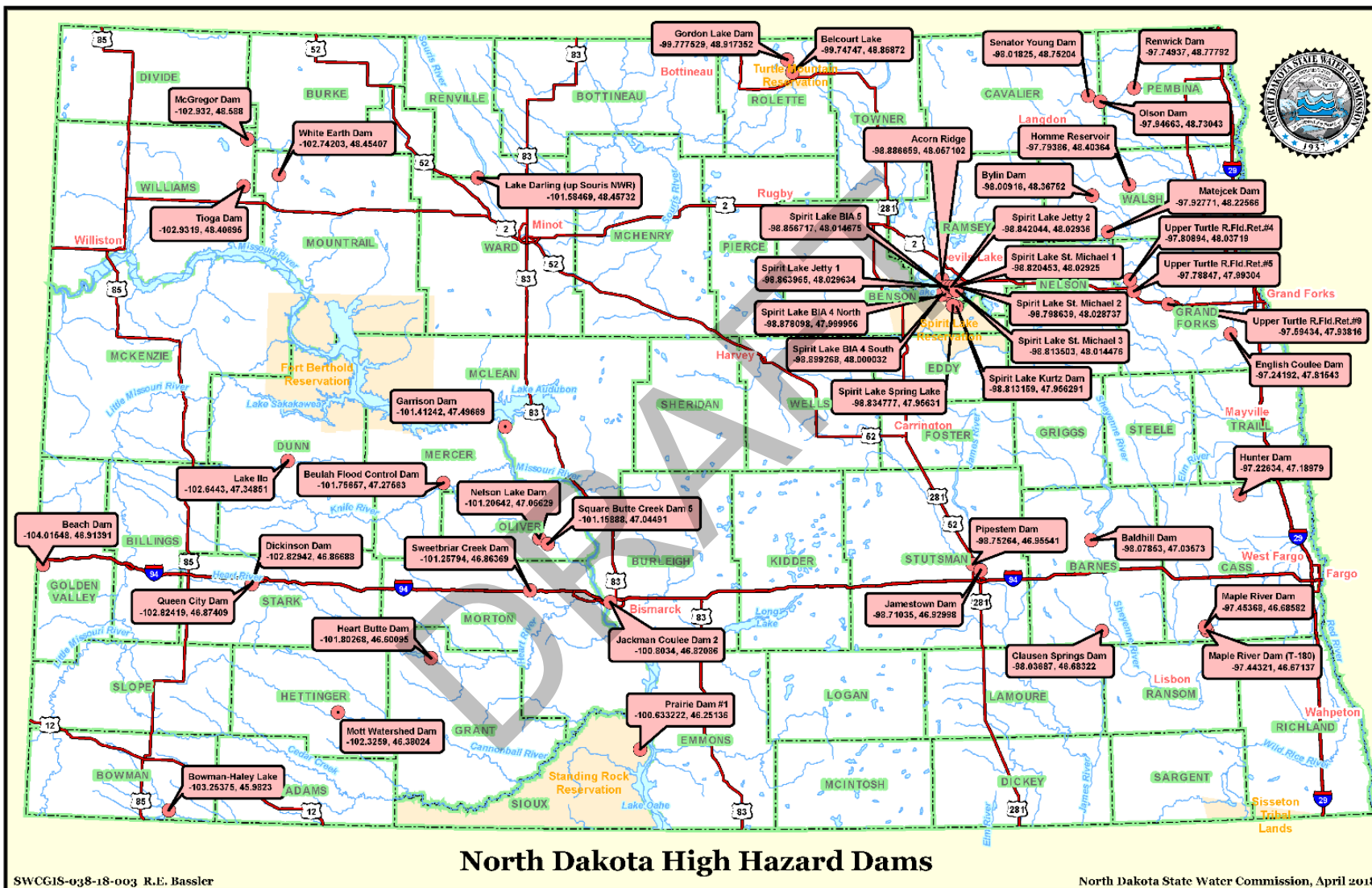
The extent/magnitude of a hazard or threat is expressed in the amount and/or number of damages or losses either actualized in a community or estimated based on known assets and levels of risk. The magnitude of dam failure in Eddy County can be determined by the area or areas of inundation for each respective dam as shown in Table 4.4.1.1, which ranges from minor impacts to low-lying farmland near the city of Sheyenne.

Vulnerabilities of Publicly-Owned Buildings and Property

Medium/significant and high hazard dams have the potential to impact publicly-owned buildings and property. County-owned buildings located in inundation areas are vulnerable to the hazard. As of March 2023, Eddy County does not have any publicly-owned buildings or property located in the inundation areas of dams.

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

Figure 4.4.1.1 – 2018 North Dakota High Hazard Dams



Source(s): 2018 State of North Dakota Hazard Mitigation Plan: N.D. Dept. of Water Resources

Risk Assessment

Table 4.4.1.2 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 4.4.1.2 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 4.4.1.2 – Eddy County, North Dakota Dam Failure Risk Assessment Scored Chart Summary

Dam Failure	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Eddy County	3	1	2	3	2	7
City of New Rockford	2	1	1	2	1	5
City of Sheyenne	3	1	2	2	1	7

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

Table 4.4.1.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of dam failure in Eddy 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 of Critical Facilities and Infrastructure

Critical facilities and infrastructure are vulnerable to dam failures like publicly-owned buildings and property if located in the inundation area of a dam. Critical facilities and infrastructure located in inundation areas are highly susceptible to impacts with the potential to be destroyed altogether. As of March 2023, Eddy County does not have any critical facilities or infrastructure located in the inundation areas of dams.

Vulnerabilities to New and Future Development

New and future development geographically located in dam inundation areas are most at risk of dam failure. New and future development would not be at risk of dam failure if constructed at an elevation above inundation areas. However, given the nature of the hazard/threat, a dam failure incident would have catastrophic impacts due to the volume of water released and the widespread reach of those waters. Although flood waters resulting from dam failures tend to flow along floodplains, flood waters would extend beyond the floodplain due to the volume of water released. As such, development located outside of the floodplain can still be at risk of a dam failure. **According to the 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP), the population of Eddy County is projected to increase by three percent (187 people) between 2010 and 2030 from 2,385 people to 2,455, respectively.**

Table 4.4.1.3 – Eddy County, North Dakota Area Dam Failure Risk Assessment

<p>Impact</p>	<ul style="list-style-type: none"> • Blocked Roads • Crop Loss • Delayed Emergency Response • Evacuation (Localized) • Flooding (Street) • Flooding (Structure) • Human Injury/Death • Livestock Injury/Death • Loss of Critical Facilities and Infrastructure 	<ul style="list-style-type: none"> • Loss of Economy • Loss of Power • Property Damage • Flooding of farms and loss of equipment • Mass Casualties/Fatalities impact depends on the inundation area of each respective dam and can range from agriculture and pastureland to catastrophic destruction of urbanized areas.
<p>Frequency</p>	<ul style="list-style-type: none"> • Never an occurrence of a dam failure 	
<p>Likelihood</p>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> • Heavy rains and/or melting of snow pact may lead to dams becoming overwhelmed 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> • Annual and ongoing dam inspections and routine maintenance performed by the N.D. Dept. of Water Resources, Dam Safety Program • Permanent trained subject matter experts providing continuous monitoring and maintenance of dams
<p>Vulnerability</p>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • Heavy rains and/or melting of snow pact may lead to dams becoming overwhelmed 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • Annual and ongoing dam inspections and routine maintenance performed by the N.D. Dept. of Water Resources, Dam Safety Program • Permanent trained subject matter experts providing continuous monitoring and maintenance of dams
<p>Capability</p>	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address dam failure. 	

Data Limitations and Other Key Documents

The N.D. Dam Design Handbook is out of date and is being updated by the N.D. Dept. of Water Resources as of September 2022. 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)
- Eddy County Comprehensive Plan
- Eddy County Continuity of Operations Plan
- Eddy County Evacuation and Shelter Plan through Eddy County Emergency Management
- Eddy County Local Emergency Operations Plan (LEOP)
- Eddy County Mass Care Plan through Lake Region District Health Unit
- Eddy County Shelter Plan through Eddy County Emergency Management
- Eddy County Threat and Hazard Identification and Risk Assessment (THIRA)
- 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 State Preparedness Report (SPR)
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)

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4.4.2 Dam Failure – Wells County, North Dakota

History

Information on the history of dam failure in Wells County was obtained from the National Performance of Dams Program, Stanford University and Wells County Office of Emergency Management.

National Performance of Dams

No dam failures were reported for Wells County.

Wells County Emergency Management

The following history on dam failure in Wells County was provided by Wells County Emergency Management.

- **July 1993.** Knodel Dam near the city of Hurdsfield washed out due to heavy rainfall. Every gravel road east-to-west from 7th St. NE and Old Highway 52 was washed out.
- **2009 and 2011.** Substantial flooding from spring melt threatened the integrity of the Harvey Dam.
- **2019.** The Sykeston Dam almost failed due to substantial spring melt.

List of Dams – Wells County

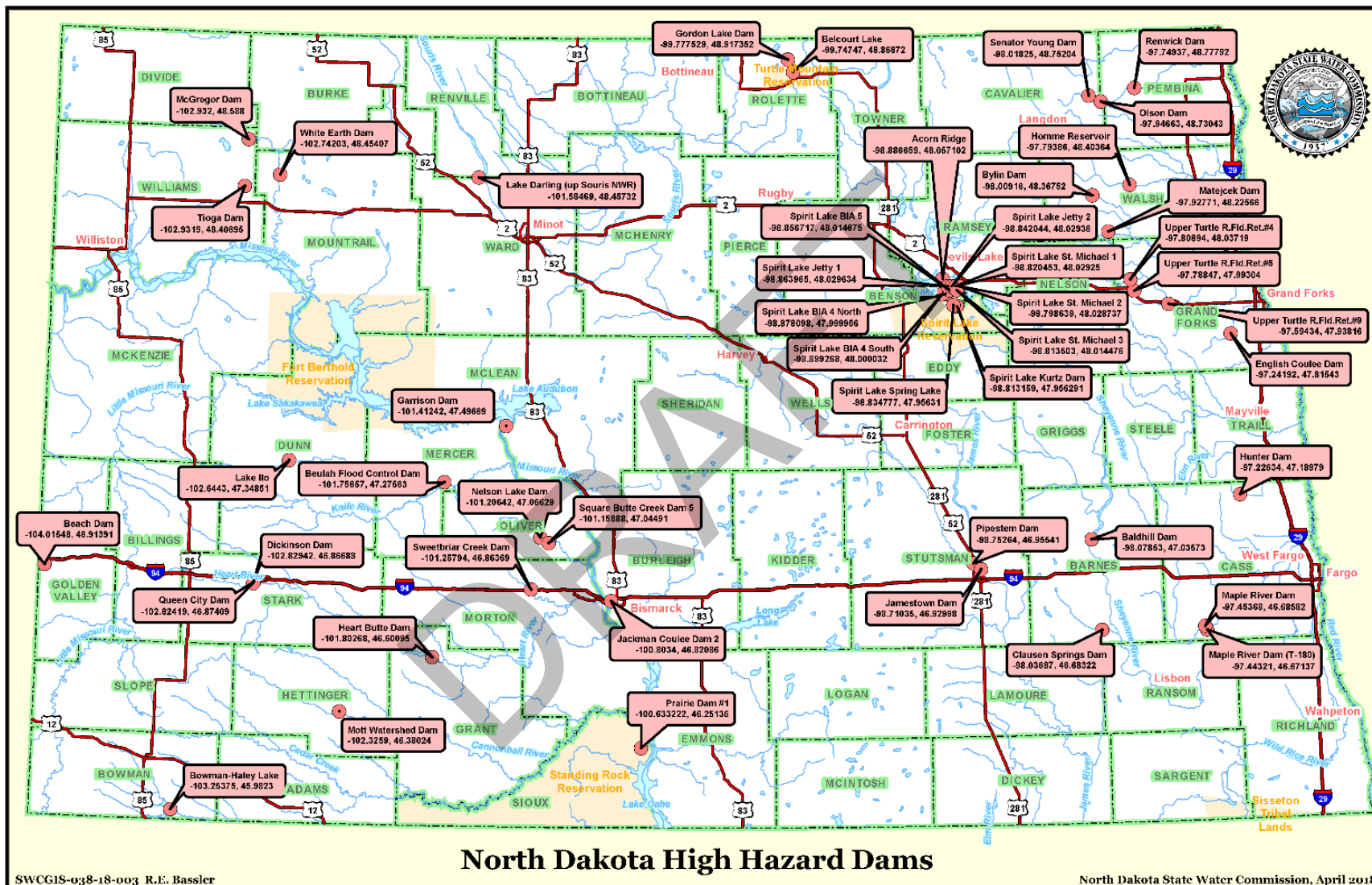
Per information provided by the N.D. Dept. of Water Resources, there are approximately forty-six (46) dams in Wells County. Due to homeland security purposes, limited information is shown regarding high and medium hazard dams in Wells County. Additional information can be accessed through the National Inventory of Dams website or by contacting the N.D. Dept. of Water Resources or Wells County Emergency Management. Per the 2018 N.D. Enhanced Mitigation MAOP, there are no high-hazard or medium hazard dams physically located in Wells County.

Table 4.4.2.1 – 2022 Wells County, North Dakota Dams with Emergency Action Plans (EAPs)

Dam	Authorized Purpose	Classification	Location	Area(s) of Inundation
Harvey Dam	Recreation, Water Supply	35.0 feet high 690.0 feet long	South of the city of Harvey city limits	<ul style="list-style-type: none"> • Agriculture/farmland • U.S. Highway 52 business loop • CP Railway earthen crossing • Harvey Country Club • Harvey Water Treatment Plant • Township roads
Sykeston Dam	Recreation, Water Supply	27.2 feet high 1,020.0 feet long	Immediately north of the city of Sykeston	<ul style="list-style-type: none"> • Agriculture/farmland • No critical facilities or infrastructure

Source(s): N.D. Dept. of Water Resources

Figure 4.4.2.1 – 2018 North Dakota High Hazard Dams



Source(s): 2018 State of North Dakota Hazard Mitigation Plan: N.D. Dept. of Water Resources

Probability

The probability of a hazard or threat is how likely it is it will happen. Based on dam failure history for Wells County and the risk assessment conducted by the stakeholder meeting, the probability of dam failure is “unlikely”. The 2018 N.D. Enhanced Mitigation MAOP lists Wells County as a low vulnerability jurisdiction for dam failure.

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 Wells County can be determined by the area or areas of inundation for each respective dam as shown in Table 4.4.2.1. **It ranges from minor impacts to farmland from stock dams and other smaller dam infrastructure to catastrophic destruction to urbanized areas and critical facilities and infrastructure in and around the city of Harvey (U.S. Highway 52 Business Loop, CP Railway earthen crossing, City of Harvey Water Treatment Plant).**

Risk Assessment

Table 4.4.2.2 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 4.4.2.2 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 4.4.2.2 – Wells County, North Dakota Dam Failure Risk Assessment Scored Chart Summary

Dam Failure	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Wells County	4	1	2	3	2	8
City of Bowdon	NA	NA	NA	NA	NA	NA
City of Cathay	NA	NA	NA	NA	NA	NA
City of Fessenden	NA	NA	NA	NA	NA	NA
City of Hamberg	NA	NA	NA	NA	NA	NA
City of Harvey	4	1	2	4	2	9
City of Hurdsfield	NA	NA	NA	NA	NA	NA
City of Sykeston	4	1	2	4	1	10

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

Table 4.4.2.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of dam failure in Wells 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 4.4.2.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of dam failure in Wells 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 4.4.2.3 – Wells County, North Dakota Area Dam Failure Risk Assessment

<p>Impact</p>	<ul style="list-style-type: none"> • Blocked Roads • Critical Facilities and Infrastructure • Crop Loss • Delayed Emergency Response • Evacuation (Localized) • Flooding (Street) • Flooding (Structure) • Human Injury/Death • Livestock Injury/Death 	<ul style="list-style-type: none"> • Loss of Economy • Loss of Power • Property Damage • Flooding of farms and loss of equipment • Mass Casualties/Fatalities impact depends on the inundation area of each respective dam and can range from agriculture and pastureland to catastrophic destruction of urbanized areas.
<p>Frequency</p>	<ul style="list-style-type: none"> • Never an occurrence of a dam failure • In 2009 and 2011, substantial flooding from spring melt threatened the integrity of the Harvey Dam 	<ul style="list-style-type: none"> • In 2019, the Sykeston Dam almost failed due to substantial spring melt
<p>Likelihood</p>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> • Heavy rains and/or melting of snow pack may lead to dams becoming overwhelmed • Aging dam infrastructure – 50+ years old 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> • Annual and ongoing dam inspections and routine maintenance performed by the N.D. Dept. of Water Resources, Dam Safety Program • Harvey Dam and Sykeston Dam have emergency action plans (EAPs) that are updated annually

<p>Vulnerability</p>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • Heavy rains and/or melting of snow pack may lead to dams becoming overwhelmed • Critical facilities and infrastructure, and homes and businesses located in the inundation area • Harvey Dam and Sykeston Dam are earthen structures – trees and saplings threaten integrity 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • Annual and ongoing dam inspections and routine maintenance performed by the N.D. Dept. of Water Resources, Dam Safety Program • Harvey Dam and Sykeston Dam provide flood control • Harvey Dam and Sykeston Dam have emergency action plans (EAPs) that are updated annually • CodeRED • Sykeston Dam has concrete spillways • Sellie Dam removed in 2016
	<p>Capability</p> <ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address dam failure. 	

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Vulnerabilities of Publicly-Owned Buildings and Property

Medium/significant and high hazard dams have the potential to impact publicly-owned buildings and property. County-owned buildings located in inundation areas are vulnerable to the hazard. As of March 2023, the city of Harvey Treatment Plant and the Peaceful Valley Country Club are publicly-owned buildings or property located in the inundation areas of the Harvey Dam. A summary of publicly-owned buildings 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 if located in the inundation area of a dam. Critical facilities and infrastructure located in inundation areas are highly susceptible to impacts with the potential to be destroyed altogether. The U.S. Highway 52 business loop, CP Railway earthen crossing, the Harvey Water Treatment Plant and township roads are critical facilities and infrastructure vulnerable to the threat.

Vulnerabilities to New and Future Development

New and future development geographically located in dam inundation areas are most at risk of dam failure. New and future development would not be at risk of dam failure if constructed at an elevation above inundation areas. However, given the nature of the hazard/threat, a dam failure incident would have catastrophic impacts due to the volume of water released and the widespread reach of those waters. Although flood waters resulting from dam failures tend to flow along floodplains, flood waters would extend beyond the floodplain due to the volume of water released. As such, development located outside of the floodplain can still be at risk of a dam failure. **According to the 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP), the population of Wells County is projected to decrease by two percent (98 people) between 2010 and 2030 from 4,207 people to 4,109, respectively.**

Data Limitations and Other Key Documents

The N.D. Dam Design Handbook is out of date and is being updated by the N.D. Dept. of Water Resources as of September 2022. 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)
- Harvey 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 State Preparedness Report (SPR)
- North Dakota Threat and Hazard Identification and Risk Assessment (THIRA)
- Sykeston Dam Emergency Action Plan (EAP)
- Wells County Comprehensive Plan
- Wells County Continuity of Operations Plan
- Wells County Evacuation and Shelter Plan through Wells County Emergency Management

- Wells County Local Emergency Operations Plan (LEOP)
- Wells County Mass Care Plan through Wells County Emergency Management
- Wells County Shelter Plan through Wells County Emergency Management
- Wells County Threat and Hazard Identification and Risk Assessment (THIRA)

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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. Drought characteristics usually include precipitation levels well below normal and temperatures higher than normal.

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

- **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.
- **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.
- **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.

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

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>

4.5.1 Drought – Eddy County, North Dakota

History

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.

Information on the history of drought in Eddy County was obtained from the National Oceanic and Atmospheric Administration’s National Climatic Data Center (NCDC); 2018 N.D. Enhanced Mitigation MAOP; the USDA, Risk Management Agency; Palmer Drought Severity Index (PDSI); U.S. Drought Monitor, and Eddy County Emergency Management and profile meeting participants. A detailed hazard history for Eddy 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 4.5.1.1 summarizes the history of drought in Eddy County between January 1, 1996, and December 31, 2022. 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. A detailed hazard history for Wells 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.

- Eddy County experienced seven occurrences of drought resulting in approximately one incident of significance approximately every four years.
- No property or crop damage was reported.
- No injuries or fatalities were reported.

Table 4.5.1.1 – 1996 to 2022 Eddy County, North Dakota Flood Hazard History Summary

Occurrences	Fatalities	Injuries	Property Damage	Crop Damage
7	0	0	\$0.00	\$0.00

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

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

- Since 1930, North Dakota has suffered drought in the 1930s, 1950s, early 1960s, mid 1970s, early 1980s, 1988 through 1991/1992, 2002 through 2004, 2006, 2008, 2012/2013, 2017, and 2020/2021.
- A state-wide drought was declared in 1980, 1981, 1988/1989, 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, Eddy County has been included in 23 drought**

declared disasters or emergencies, of which 12 were state declared emergency orders, one was presidential, and 13 were U.S.D.A. Secretarial Declarations.

U.S. Dept. of Agriculture

- 13 USDA Secretarial Declarations in Eddy County between 2006 and 2017.

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, 2022, Eddy County experienced 328 incidents of crop loss due to drought impacting approximately 317,160.53 acres of crops totaling \$32,506,529.89 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 4.5.1.1 is the PDSI and was provided by the North Dakota State Climatologist at North Dakota State University.
- According to PDSI, between 1895 and 2021 North Dakota experienced multi-year droughts in the 1930s, 1950s, 1980s, and 2000s, and 2020/2021.

Eddy County Emergency Management

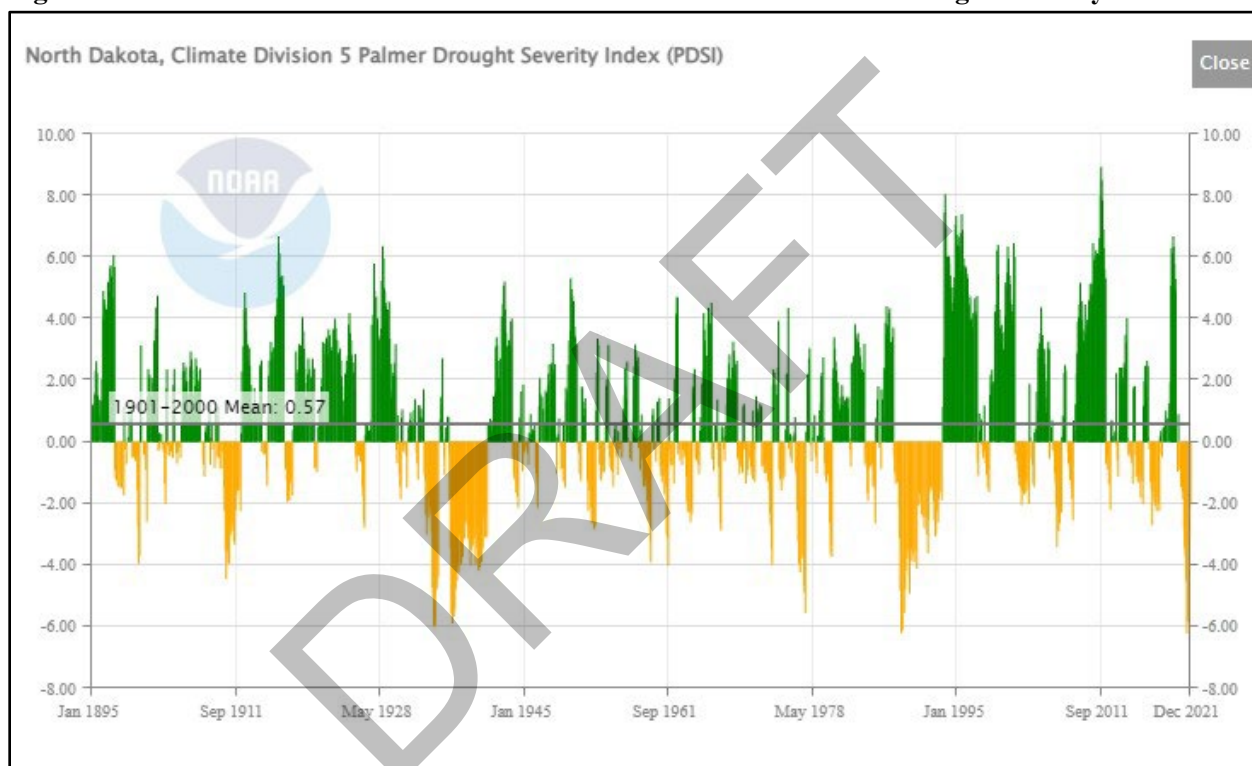
Information gathered from the drought profile meeting and Steering Committee meetings indicated that while dryer periods have come and gone, the most recent droughts of significance occurred in 1988/1989 and lasted until 1991/1992, and the summer/fall of 2020/2021. Participants also noted a five-to 10-year cyclical pattern where dry conditions will persist for that period, then transition to more wet conditions.

Probability

The probability of a hazard or threat is how likely 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 Eddy County is ‘highly likely,’ meaning there is a 100 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.

- **Based on 12 state declared emergency orders, one was presidential, and 13 U.S.D.A. Secretarial Declarations pertaining to drought between 1976 and 2017, the probability of drought is 63.4 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, Eddy County experienced \$1,477,569.541 in annualized crop damages impacting 14,416.39 acres resulting in approximately 15 annual claims of indemnity between 2001 and 2022. **Therefore, based on data available, the probability of crop loss from drought is calculated to be 100 percent annually.**

Figure 4.5.1.1 – 1895 to 2021 North Dakota Climate Division 8 Palmer Drought Severity Index



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

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. Profile meeting participants indicated the magnitude or impact of drought in Eddy 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.

- Eddy County has a low-moderate overall vulnerability from drought based on \$9,024,960.00 in crop insurance paid between 2003 and 2017 due to impacts of drought resulting in annualized payments of \$676,027.00 in the same time frame.

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. Figures 4.5.1.2 and 4.5.1.3 show the status of drought conditions in North Dakota as of August 17, 2021, and August 11, 2022, respectively. Eddy County was classified as either D3 (Exceptional Drought) or D3 (Extreme Drought) in August 2021 while no drought classifications were present in August 2022.

Risk Assessment

Table 4.5.1.1 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 4.5.1.1 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.

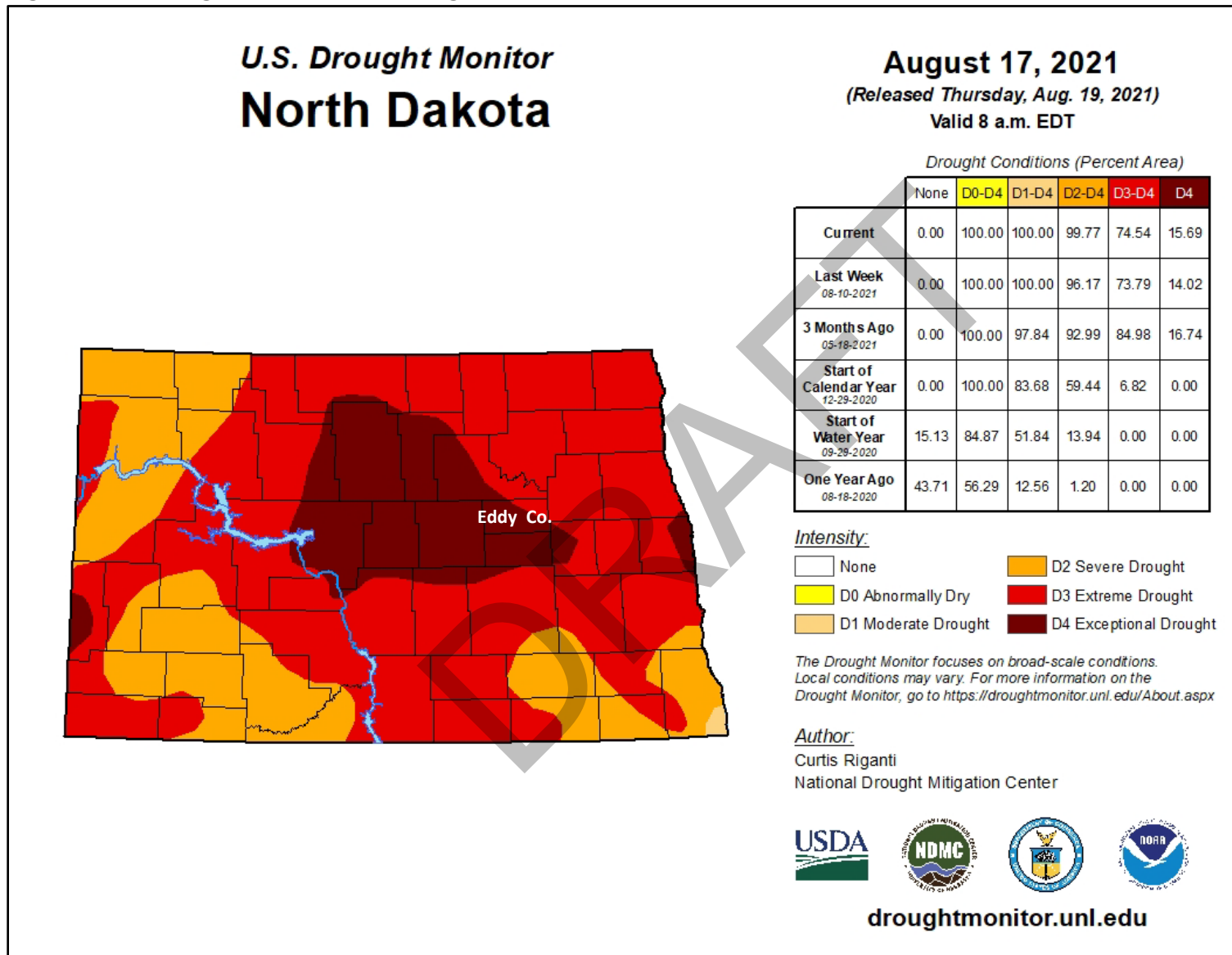
Table 4.5.1.1 – Eddy County, North Dakota Drought Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Eddy County	4	3	4	4	2	13
City of Sheyenne	4	3	4	4	2	13
City of New Rockford	4	3	4	4	2	13

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

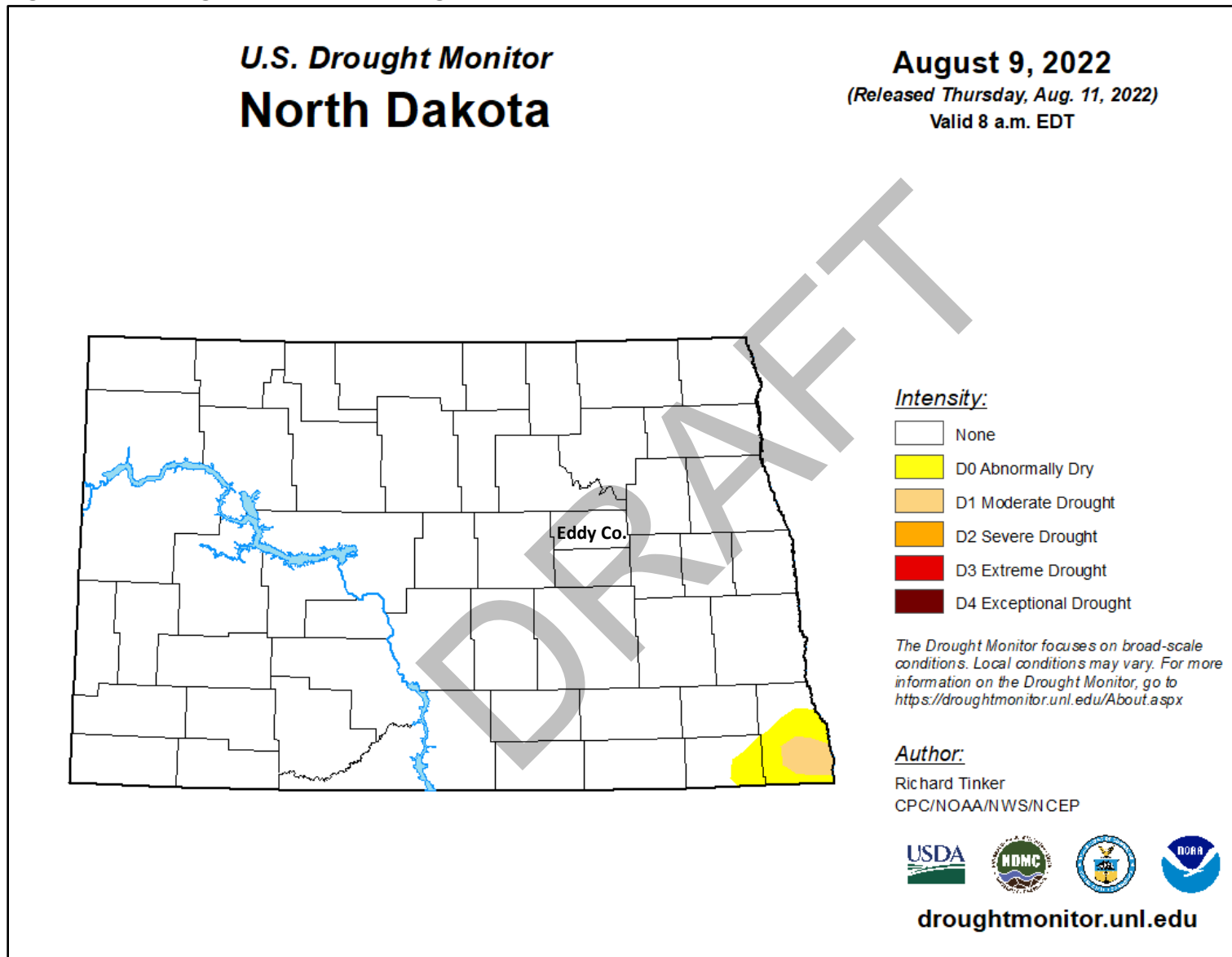
A list of impacts identified as commonplace for natural hazards and man-made threats regardless of the jurisdiction is shown in Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA). Table 4.5.1.2 provides information on the specific impact, frequency, likelihood, vulnerability, and capability of drought in Eddy County.

Figure 4.5.1.2 – August 17, 2021, U.S. Drought Monitor, North Dakota



Source(s): U.S. Drought Monitor

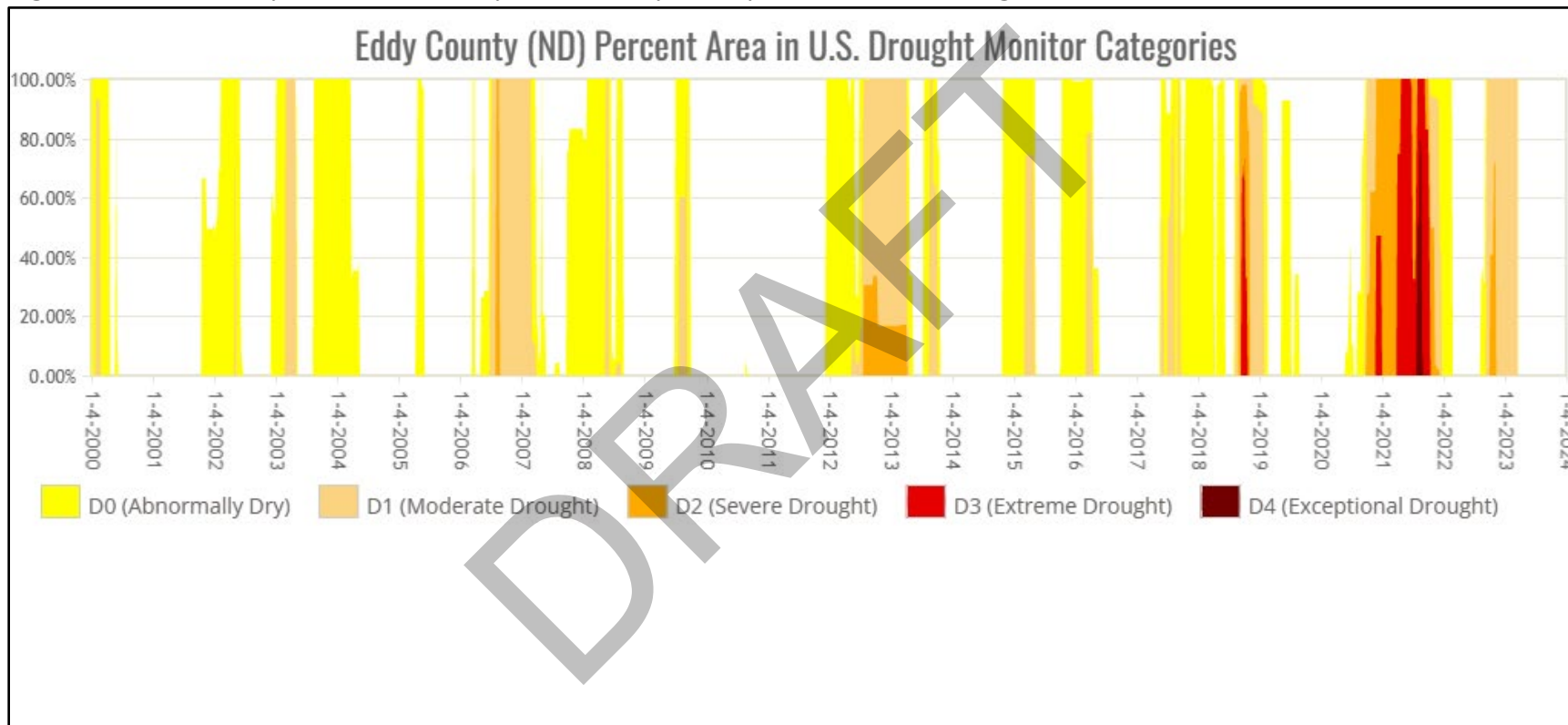
Figure 4.5.1.3 – August 9, 2022, U.S. Drought Monitor, North Dakota



Source(s): U.S. Drought Monitor

Figure 4.5.1.4 shows the time series of drought for Eddy County from January 4, 2000, to January 4, 2024, and the percent of the county and its respective drought classification. The figure is shown to assist Eddy County in understanding the characteristics of local drought impacts. As seen in the figure, Eddy County has had a majority of abnormally dry conditions every year with brief periods of moderate drought mixed with small instances of severe and extreme drought between 2006 and 2007, 2012 and 2013, the summer of 2017, and 2020/2021.

Figure 4.5.1.4 – January 4, 2000, to January 4, 2024, Eddy County, North Dakota Drought Time Series



Source(s): U.S. Drought Monitor

Table 4.5.1.2 – Eddy County, North Dakota Area Drought Risk Assessment

<p>Impact</p>	<ul style="list-style-type: none"> • Crop Loss • Loss of Economy • Loss of Livestock • Loss of Wildlife Habitat • Increase in Wildland Fire Potential • Water quality compromised from lakes and stock dams • Diminished soil health and air quality from dust • Negative impact on mental health of producers and first responders – “community impact” • Soil erosion 	<ul style="list-style-type: none"> • Local producers forced to reduce herd sizes and restructuring of harvest usage • Population decline due to loss of jobs/economy • Annualized crop damage of \$676,027.00 between 2003 and 2017 (2018 State Enhanced Mitigation MAOP) • Between January 1, 2001, and December 31, 2022, Eddy County experienced 328 incidents of crop loss due to drought impacting approximately 317,160.53 acres of crops totaling \$32,506,529.89 in losses. (USDA, RMA)
<p>Frequency</p>	<ul style="list-style-type: none"> • Severe Drought of 1961/1962, 1988/1989 through 1991/1992, 2012/2013, 2017, 2020/2021 • Summer of 2017 and 2020/2021 local producers forced to sell off portions of their herds • End of July through winter of 2017 and 2020/2021 – county reached severe drought status • Severe drought conditions winter 2020/2021 and summer/fall 2021 • CRP was released from haying during severe years • Eddy County experienced seven occurrences of drought resulting in approximately one incident of significance approximately every four years. 	<ul style="list-style-type: none"> • Annualized crop damage of \$676,027.00 between 2003 and 2017 (2018 State Enhanced Mitigation MAOP) • FSA activated the Livestock Forage Program in 2012, 2017, and 2020/2021 • Based on 12 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 64.3 percent in any given year. • According to crop loss data from the USDA-RMA, Eddy County experienced \$1,477,569.541 in annualized crop damages impacting 14,416.39 acres resulting in approximately 15 annual claims of indemnity between 2001 and 2022

Table 4.5.1.2 – Eddy County, North Dakota Area Drought Risk Assessment – Continued

<p>Likelihood</p>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> • Dry/wet cycle every five to 10 years • Climatic patterns will result in an eventual drought of significance • Lack of precipitation • Weather patterns becoming more irregular and extreme • Timing of rain impacts likelihood in any given year • Lack of subsoil moisture • High temperature and high winds 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> • Heavy precipitation • Producers work with state to develop irrigation measures • Timing of rain impacts likelihood in any given year • Low temperatures and low winds
<p>Vulnerability</p>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • Loss of economy from decreased wildlife & hunting • Agriculture economy • Elderly population • Flat terrain/open topography contributes to conditions • Pastureland adjacent to structures and city limits • Lack of water sources for drought relief and for suppression of fires resulting from drought in some jurisdictions • Lack of irrigation systems throughout the county • Tillage systems for crops • Presence of aquifers, which are used for livestock and municipal water sources, can be depleted during droughts of significance • The largest water user in Eddy County in 2016 by reported use was the city of New Rockford municipal system consuming 855.00 acre-feet of water annually. 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • Financial assistance programs made available by the state and federal government • Burn bans • Fire Index monitoring and mapping from NDDDES • Drought Monitor updating drought conditions on a weekly basis (every Thursday) • Advanced communications such as internet and TV • Incorporated jurisdictions with water towers • Regional water systems • No-till farming practices in use across the county • Presence of CRP • Presence of aquifers for water supplies • N.D. Agriculture Weather Network <p><u>Municipal Water Storage Capacity</u></p> <ul style="list-style-type: none"> • City of Sheyenne: 50,000 gallons • City of New Rockford: 290,000-gallon water tower and a 250,000-gallon clear well.

Table 4.5.1.2 – Eddy County, North Dakota Area Drought Risk Assessment - Continued

Capability	<p><u>Administrative and Technical</u></p> <ul style="list-style-type: none"> • Active county commission and part-time emergency manager • NDSU Extension/Eddy County • Farm Service Agency (FSA) and Natural Resource Conservation Service (NRCS) • Contracts for engineering, planning and grant writing • GIS services provided through state • County-wide mutual aid agreements • U.S.D.A. Emergency Board • Eddy County Soil Conservation District (SCD) • N.D. Agriculture Weather Network • North Dakota State University Climatologist • Stockmen’s Association
	<p><u>Education and Outreach</u></p> <ul style="list-style-type: none"> • Active emergency management department with education and outreach on the department’s website and social media • Eddy County Soil Conservation District (SCD) • Farm Service Agency (FSA) • NDSU Extension/Eddy County
	<p><u>Financial</u></p> <ul style="list-style-type: none"> • FSA has programs designed to financially assist farmers in times of need (FLP, LIP, LFAP – all cattle) • N.D. Dept. of Agriculture • National Resources Conservation Service (ECP – all cattle) • U.S.D.A., Risk Management Agency crop insurance subsidized by federal government • U.S.D.A. Rural Development-REAP grants • Rural water district
	<p><u>Planning and Regulatory</u></p> <ul style="list-style-type: none"> • Burn bans implemented by county commission • State implements burn bans • Drought management and water conservation plans at the county and city level • Farmers receiving USDA benefits required to have a highly erodible plan of operation in place • Regional/rural water districts – have drought management and water conservation plans in place

Vulnerabilities to Publicly-Owned Buildings and Property

Drought has not had a direct impact on publicly-owned buildings and property in Eddy County. Loss of water supply would influence the function of publicly-owned buildings and property, but not cease operation altogether. 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. In Eddy County, the Lutheran Home of the Good Shepherd and New Rockford-Sheyenne Public School relies on water to maintain continuous operation. Large employers in the agriculture sector and manufacturing 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

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 Southwest Water Authority. Incorporated jurisdictions and 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 and decrease the demand for water and the vulnerability of drought in Eddy County.

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

According to the 2018 ND Enhanced Mitigation MAOP, the largest water user in Eddy County in 2016 by reported use was the city of New Rockford municipal system consuming 855.00 acre-feet of water annually.

The city of New Rockford upgraded its drinking/potable water system by replacing water mains and retrofitting the city's water plant.

Data Limitations

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.

National Climatic Data Center/National Oceanic and Atmospheric Administration

The hazard history provided in terms of property damage and crop damage (which are only estimates) is calculated based on what the National Weather Service received from insurance companies and individual property owners upon request. Both sources have been reluctant to share that information. Therefore, both practices were discontinued. Because of this, the National Weather Service makes a best guess using all available data at the time of the publication. The damage amounts are received from a variety of sources. Property and crop damage should be considered as a broad estimate.

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. **Drought was not recorded as a separate incident until 1996. Therefore, the drought of 1988/1989 through 1991/1992, which was a significant event in recent North Dakota history, was not listed as impacting Eddy County when hazard history was taken from the National Climatic Data Center.**

- 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

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.

Other Key Documents

This plan incorporates data from the following documents and information herein will be used in future updates.

- 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)
- Burn Bans
- Farm Services Agency's Annual Yield Estimate Reporting
- Eddy County Comprehensive Plan (2014)
- Eddy County Commercial Animal Feed Operation Ordinance

- Eddy County Evacuation Plan through Eddy County Emergency Management
- Eddy County Local Emergency Operations Plan (LEOP)
- Eddy County Mass Care Plan through Lake Region District Health Unit
- Eddy County Shelter Plan through Eddy County Emergency Management
- Eddy County Threat and Hazard Identification and Risk Assessment (THIRA)
- National Agricultural Statistics Service's (NASS) Crop Progress and Condition Report
- National Drought Mitigation Center's Drought Condition Monitoring Observations Report (CMOR)
- 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)

DRAFT

4.5.2 Drought – Wells County, North Dakota

History

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.

Information on the history of drought in Wells County was obtained from the National Oceanic and Atmospheric Administration’s National Climatic Data Center (NCDC); 2018 N.D. Enhanced Mitigation MAOP; the USDA, Risk Management Agency; Palmer Drought Severity Index (PDSI); U.S. Drought Monitor, and Wells County Emergency Management and profile meeting participants. A detailed hazard history for Wells 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 4.5.2.1 summarizes the history of drought in Wells County between January 1, 1996, and December 31, 2022. 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. A detailed hazard history for Wells 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.

- Wells County experienced nine occurrences of drought resulting in approximately one incident of significance approximately every three years.
- No property or crop damage was reported.
- No injuries or fatalities were reported.

Table 4.5.2.1 – 1996 to 2022 Wells County, North Dakota Flood Hazard History Summary

Occurrences	Fatalities	Injuries	Property Damage	Crop Damage
9	0	0	\$0.00	\$0.00

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

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

- Since 1930, North Dakota has suffered drought in the 1930s, 1950s, early 1960s, mid 1970s, early 1980s, 1988 through 1991/1992, 2002 through 2004, 2006, 2008, 2012/2013, 2017, and 2020/2021.
- A state-wide drought was declared in 1980, 1981, 1988/1989, 2002, 2005, and 2012 impacting all counties in North Dakota.
- **Presidential declarations pertaining to drought occur before secretarial declarations by the USDA as secretarial declarations are not permitted without a presidential declaration. Since 1976, Wells County has been included in 27 drought declared disasters or**

emergencies, of which 12 were state declared emergency orders, one was presidential, and 14 were U.S.D.A. Secretarial Declarations.

U.S. Dept. of Agriculture

- USDA Secretarial Disaster Designations S3467, S3960, S4138, S4186, and S4191, S4193 declared on included January 1, 2012, March 1, 2015, April 1, 2016, June 20, 2017, June 27, 2017, and July 4, 2017, in Wells County.

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, 2022, Wells County experienced 414 incidents of crop loss due to drought impacting approximately 861,749.98 acres of crops totaling \$98,765,959.56 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 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 4.5.2.1 is the PDSI and was provided by the North Dakota State Climatologist at North Dakota State University.
- According to PDSI, between 1895 and 2021 North Dakota experienced multi-year droughts in the 1930s, 1950s, 1980s, and 2000s, and 2020/2021.

Wells County Emergency Management

Information gathered from the drought profile meeting and Steering Committee meetings indicated that while dryer periods have come and gone, the most recent droughts of significance occurred in 1988/1989 and lasted until 1991/1992, and the summer/fall of 2020/2021. Participants also noted a five-to 10-year cyclical pattern where dry conditions will persist for that period, then transition to more wet conditions.

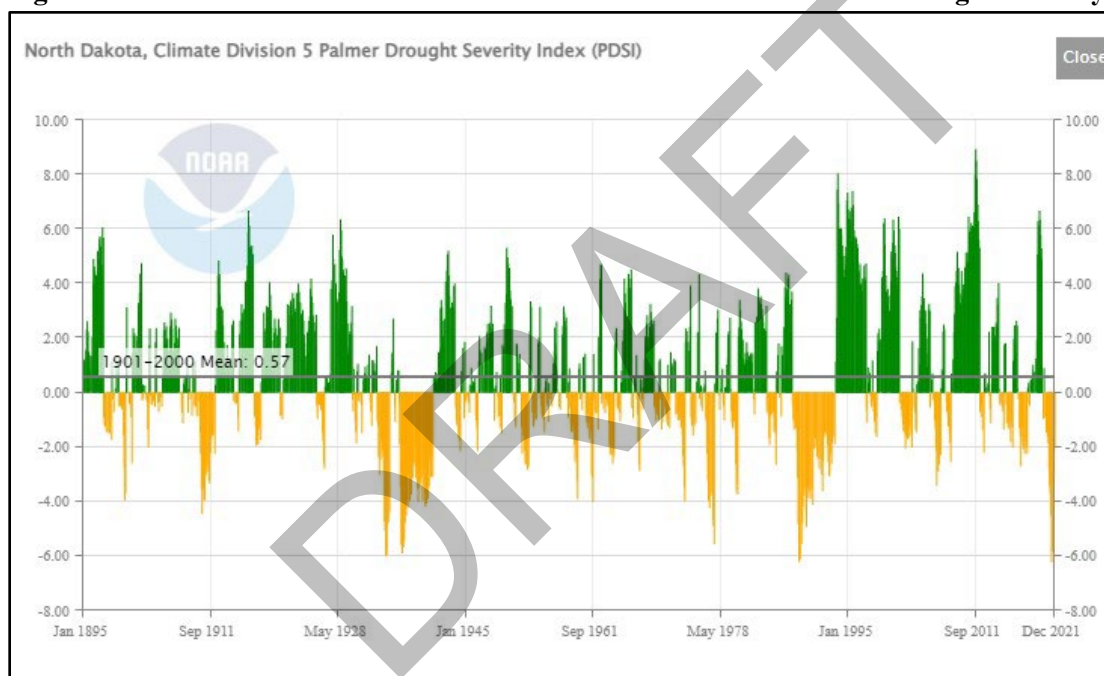
Probability

The probability of a hazard or threat is how likely 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 Wells County is “highly likely,” meaning there is a 100 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.

- **Based on 12 state declared emergency orders, one was presidential, and 14 U.S.D.A. Secretarial Declarations pertaining to drought between 1976 and 2017, the probability of drought is 64.2 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, Wells County experienced \$4,489,361.80 in annualized crop damages impacting 39,170.45 acres resulting in approximately 19 annual claims of indemnity between 2001 and 2022. **Therefore, based on data available, the probability of crop loss from drought is calculated to be 100 percent annually.**

Figure 4.5.2.1 – 1895 to 2021 North Dakota Climate Division 8 Palmer Drought Severity Index



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

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. Profile meeting participants indicated the magnitude or impact of drought in Wells County as catastrophic meaning that more than 50 percent of the county, its people and property would be 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.

- Wells County has a low-moderate overall vulnerability from drought based on \$21,506,824.000 in crop insurance paid between 2003 and 2017 due to impacts of drought resulting in annualized payments of \$1,610,998.000 in the same time frame.

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. Figures 4.5.2.2 and 4.5.2.3 show the status of drought conditions in North Dakota as of August 17, 2021, and August 11, 2022, respectively. Wells County was classified as D4 (Exceptional Drought) in August 2021 while no drought classifications were present in August 2022.

Risk Assessment

Table 4.5.2.1 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 4.5.2.1 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.

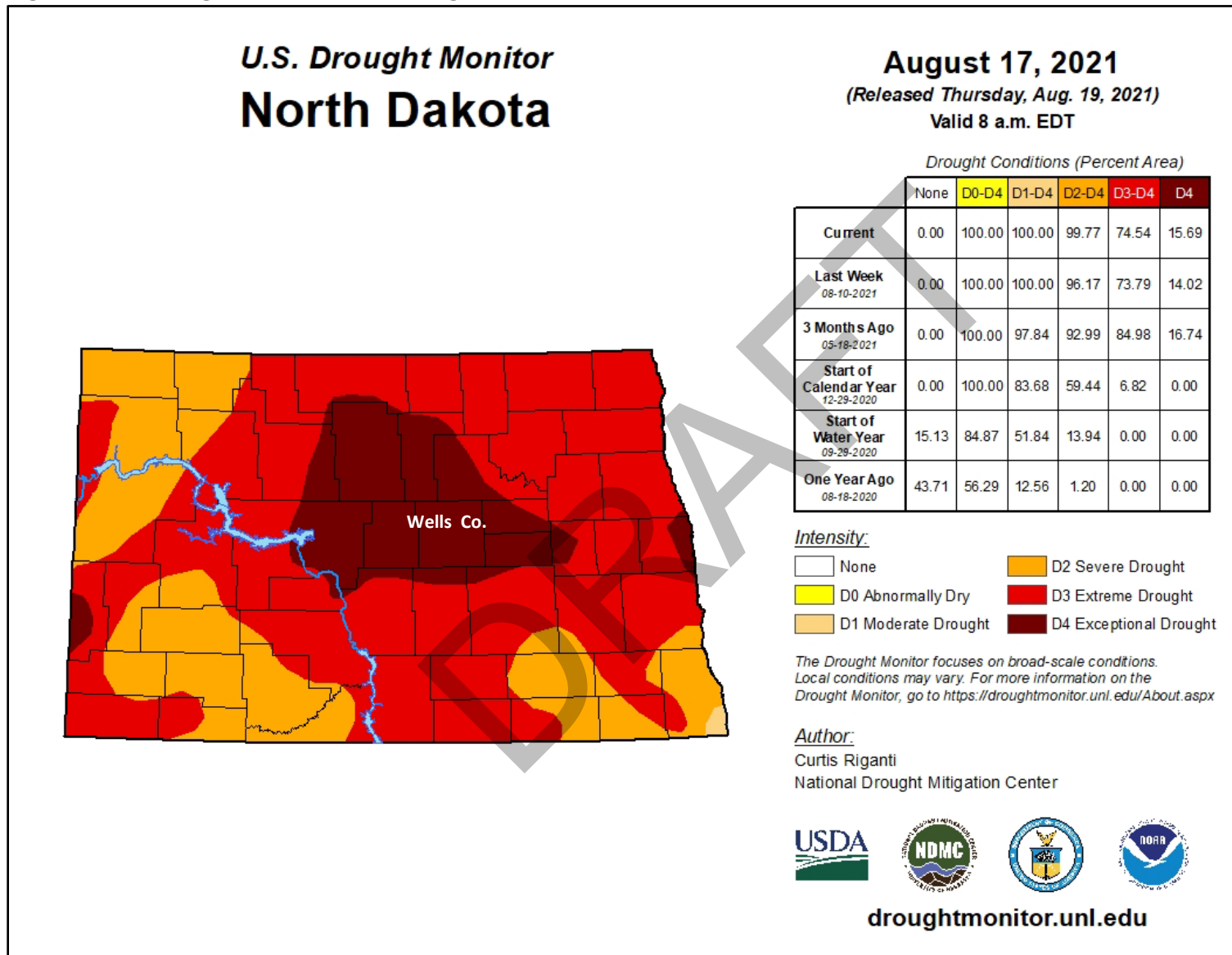
Table 4.5.2.1 – Wells County, North Dakota Drought Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Wells County	4	3	4	4	2	13
City of Bowdon	4	3	4	4	2	13
City of Cathay	4	3	4	4	2	13
City of Fessenden	4	3	4	4	2	13
City of Hamberg	4	3	4	4	2	13
City of Harvey	4	3	4	4	2	13
City of Hurdsfield	4	3	4	4	2	13
City of Sykeston	4	3	4	4	2	13

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

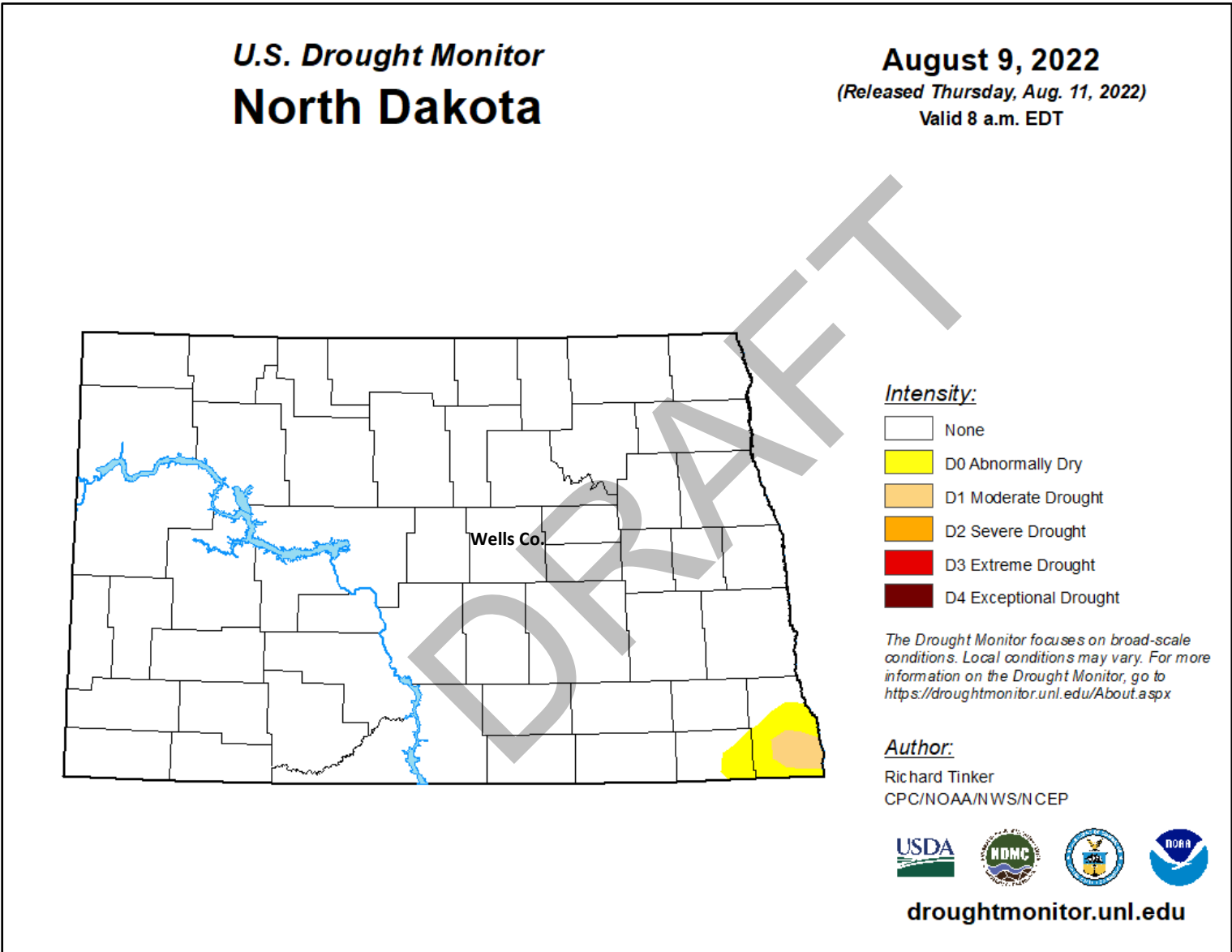
A list of impacts identified as commonplace for natural hazards and man-made threats regardless of the jurisdiction is shown in Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA). Table 4.5.2.2 provides information on the specific impact, frequency, likelihood, vulnerability, and capability of drought in Wells County.

Figure 4.5.2.2 – August 17, 2021, U.S. Drought Monitor, North Dakota



Source(s): U.S. Drought Monitor

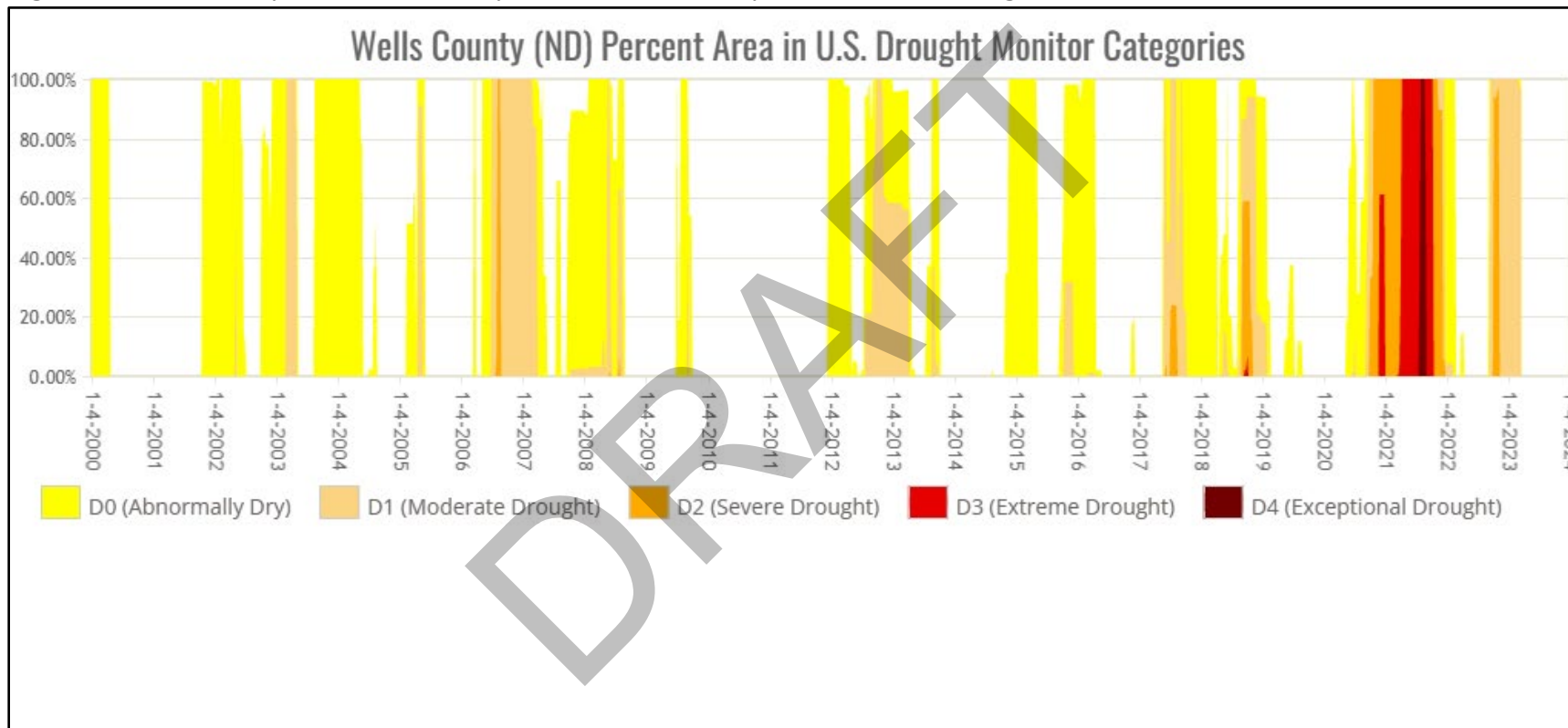
Figure 4.5.2.3 – August 9, 2022, U.S. Drought Monitor, North Dakota



Source(s): U.S. Drought Monitor

Figure 4.5.2.4 shows the time series of drought for Wells County from January 4, 2000, to January 4, 2024, and the percent of the county and its respective drought classification. The figure is shown to assist Wells County in understanding the characteristics of local drought impacts. As seen in the figure, Wells County has had a majority of abnormally dry conditions every year with brief periods of moderate drought mixed with small instances of severe and extreme drought between 2006 and 2007, 2012 and 2013, the summer of 2017, and 2020/2021.

Figure 4.5.2.4 – January 4, 2000, to January 4, 2024, Wells County, North Dakota Drought Time Series



Source(s): U.S. Drought Monitor

Table 4.5.2.2 – Wells County, North Dakota Area Drought Risk Assessment

<p>Impact</p>	<ul style="list-style-type: none"> • Crop Loss • Loss of Economy • Loss of Livestock • Loss of Wildlife Habitat • Increase in Wildland Fire Potential • Water quality compromised from lakes and stock dams • Diminished soil health and air quality from dust • Negative impact on mental health of producers and first responders – “community impact” • Soil erosion <ul style="list-style-type: none"> • Local producers forced to reduce herd sizes and restructuring of harvest usage • Population decline due to loss of jobs/economy • Annualized crop damage of \$1,610,998.00 between 2003 and 2017 • Between January 1, 2001, and December 31, 2022, Wells County experienced 414 incidents of crop loss due to drought impacting approximately 861,749.98 acres of crops totaling \$98,765,959.56 in losses (USDA, RMA)
<p>Frequency</p>	<ul style="list-style-type: none"> • Severe Drought of 1961/1962, 1988/1989 through 1991/1992, 2012/2013, 2017, 2020/2021 • Summer of 2017 and 2020/2021 local producers forced to sell off portions of their herds • End of July through winter of 2017 and 2020/2021 – county reached severe drought status • Severe drought conditions winter 2020/2021 and summer/fall 2021 • CRP was released from haying during severe years • Wells County experienced nine occurrences of drought resulting in approximately one incident of significance approximately every three years. <ul style="list-style-type: none"> • According to the 2018 N.D. Enhanced Mitigation MAOP, Wells County experienced \$1,610,998 in annualized drop damage between 2003 and 2017 • FSA activated the Livestock Forage Program in 2012, 2017, and 2020/2021 • Based on 12 state declared emergency orders, one was presidential, and 14 were U.S.D.A. Secretarial Declarations pertaining to drought between 1976 and 2017, the probability of drought is 64.2 percent in any given year. • According to crop loss data from the USDA-RMA, Wells County experienced \$4,489,361.80 in annualized crop damages impacting 39,170.45 acres resulting in approximately 19 annual claims of indemnity between 2001 and 2022.

Table 4.5.2.2 – Wells County, North Dakota Area Drought Risk Assessment – Continued

<p>Likelihood</p>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> • Dry/wet cycle every five to 10 years • Climatic patterns will result in an eventual drought of significance • Lack of precipitation • Weather patterns becoming more irregular and extreme • Timing of rain impacts likelihood in any given year • Lack of subsoil moisture • High temperature and high winds 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> • Heavy precipitation • Producers work with state to develop irrigation measures • Timing of rain impacts likelihood in any given year • Low temperatures and low winds
<p>Vulnerability</p>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • Loss of economy from decreased wildlife & hunting • Agriculture economy • Elderly population • Flat terrain/open topography contributes to conditions • Pastureland adjacent to structures and city limits • Lack of water sources for drought relief and for suppression of fires resulting from drought in some jurisdictions • Lack of irrigation systems throughout the county • Tillage systems for crops • Presence of aquifers, which are used for livestock and municipal water sources, can be depleted during droughts of significance • The largest water user in Wells County in 2016 by reported use was rural water utilizing ground water resources consuming 212.00 acre-feet of water annually 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • Financial assistance programs made available by the state and federal government • Burn bans • Fire Index monitoring and mapping from NDDDES • Drought Monitor updating drought conditions on a weekly basis (every Thursday) • Advanced communications such as internet and TV • Incorporated jurisdictions with water towers • Regional water systems • No-till farming practices in use across the county • Presence of CRP AND aquifers for water supplies • N.D. Agriculture Weather Network <p><u>Municipal Water Storage Capacity</u></p> <ul style="list-style-type: none"> • City of Fessenden: Ground storage at 500,000-gallons and water tower with 50,000 gallons • City of Sykeston: Water tower with 50,000 gallons • City of Bowdon: 110,00- gallon ground storage tank • City of Harvey: Water tower with 300,000 gallons, 500,000 gallons ground storage tank, and water treatment plant with 110,000 gallons • Central Plains Rural Water District: 405,000-gallon storage capacity in Wells County

Table 4.5.2.2 – Wells County, North Dakota Area Drought Risk Assessment - Continued

Capability	<u>Administrative and Technical</u> <ul style="list-style-type: none"> • Active county commission and full-time emergency manager • NDSU Extension/Wells County • Farm Service Agency (FSA) and Natural Resource Conservation Service (NRCS) • Contracts for engineering, planning, and grant writing • GIS services provided through state • County-wide mutual aid agreements • U.S.D.A. Emergency Board • Wells County Soil Conservation District (SCD) • N.D. Agriculture Weather Network • North Dakota State University Climatologist • Stockmen’s Association
	<u>Education and Outreach</u> <ul style="list-style-type: none"> • Active emergency management department with education and outreach on the department’s website and social media • Wells County Soil Conservation District (SCD) • Farm Service Agency (FSA) • NDSU Extension/Wells County
	<u>Financial</u> <ul style="list-style-type: none"> • FSA has programs designed to financially assist farmers in times of need (FLP, LIP, LFAP – all cattle) • N.D. Dept. of Agriculture • National Resources Conservation Service (ECP – all cattle) • U.S.D.A., Risk Management Agency crop insurance subsidized by federal government • U.S.D.A. Rural Development-REAP grants • Rural water district
	<u>Planning and Regulatory</u> <ul style="list-style-type: none"> • Burn bans implemented by county commission • State implements burn bans • Drought management and water conservation plans at the county and city level • Farmers receiving USDA benefits required to have a highly erodible plan of operation in place • Regional/rural water districts – have drought management and water conservation plans in place

Vulnerabilities to Publicly-Owned Buildings and Property

Drought has not had a direct impact on publicly-owned buildings and property in Wells County. Loss of water supply would influence the function of publicly-owned buildings and property, but not cease operation altogether. 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. In Wells County, the Wells County Courthouse and St. Aloisius Hospital & Medical Center, Fessenden-Bowdon Public School, and Harvey Public school rely on water to maintain continuous operation. Large employers in the agriculture sector and manufacturing 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

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 Southwest Water Authority. Incorporated jurisdictions and 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 and decrease the demand for water and the vulnerability of drought in Wells County.

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

According to the 2018 ND Enhanced Mitigation MAOP, the largest water user in Wells County in 2016 by reported use was rural water utilizing ground water resources consuming 212.00 acre-feet of water annually.

The city of Harvey water tower and water treatment plant was installed in 2005, and a ground-storage building was built in 2016. The city's water mains were updated in 2010. **In 2018, the city removed its microclour system and put in an iox.** The city's lift station also had a backup generator installed in 2020. The drinking/potable water lines coming in from the wells had gate-valves installed to mitigate against breaks in 2022. The city also received grant funding to update LC3 panels. The well pumps were upgraded in 2020 and 2021. A generator for backup power at the water treatment plant is being installed in the fall of 2023 through HMGP funding. The city's lift station also had a backup generator installed in 2020.

The city of Fessenden installed and upgraded its water tower in 2019 with the capacity to accommodate new and future development.

Data Limitations

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.

National Climatic Data Center/National Oceanic and Atmospheric Administration

The hazard history provided in terms of property damage and crop damage (which are only estimates) is calculated based on what the National Weather Service received from insurance companies and individual property owners upon request. Both sources have been reluctant to share that information. Therefore, both practices were discontinued. Because of this, the National Weather Service makes a best guess using all available data at the time of the publication. The damage amounts are received from a variety of sources. Property and crop damage should be considered as a broad estimate.

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. **Drought was not recorded as a separate incident until 1996. Therefore, the drought of 1988/1989 through 1991/1992, which was a significant event in recent North Dakota history, was not listed as impacting Wells County when hazard history was taken from the National Climatic Data Center.**

- 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 tornadoes, 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

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.

Other Key Documents

This plan incorporates data from the following documents and information herein will be used in future updates.

- 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)
- Burn Bans
- Farm Services Agency's Annual Yield Estimate Reporting
- National Agricultural Statistics Service's (NASS) Crop Progress and Condition Report
- National Drought Mitigation Center's Drought Condition Monitoring Observations Report (CMOR)
- 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)
- Wells County Comprehensive Plan
- Wells County Commercial Animal Feed Operation Ordinance
- Wells County Evacuation Plan through Wells County Emergency Management
- Wells County Local Emergency Operations Plan
- Wells County Mass Care Plan through Wells County Emergency Management
- Wells County Shelter Plan through Wells County Emergency Management
- Wells County 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 The Planning Area, 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.

Seasonal Pattern	Urban Fire/Structure Collapse – None. Probability is always more prevalent in urban areas due to large concentrations of structures . Rural and Wildland Fire – More prevalent during summer months
Duration	Rural and Urban Fire/Structure Collapse – Minutes/hours/days Wildland Fire – Minutes/hours/days, up to weeks in exceptional cases
Speed of Onset	Little to no warning. Wildland onset is quicker during drought/low humidity, high winds, etc.
Location	Urban Fire/Structure Collapse – incorporated jurisdictions Rural and Wildland Fire – 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.

4.7 Flood

Including closed basin, flash floods, groundwater saturation and seepage, high dam release, 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.

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 intensified by man-made interference with nature.

A brief description of the types of flooding are as follows and was provided by the 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP):

- **Closed Basin:** Flooding in a closed basin occurs when surface water cannot flow naturally out of the basin as a river does (until a natural overflow elevation is reached), and therefore, normally dry locations can fill in with water during wet periods.
- **Flash Floods:** Flash flooding occurs when heavy rain falls in such a short time that the soil cannot absorb it and/or drainage systems (natural or human-made) cannot carry the volume of water away as quickly as it accumulates.

A flash flood is usually caused by severe thunderstorms, heavy rains on snowpack, slow moving storms, dam, dike, or levee failures, or ice jam releases. Flash floods can occur anywhere when a large volume of water inundates an area over a short time-period. Because of the localized nature of flash floods and variables in rainfall amounts and duration, clearly defined areas prone to flash flooding are difficult to identify.

- **Groundwater Seepage:** Groundwater seepage occurs when water (originating from rainwater and soaks into the ground filling available space in the soil) flows or collects beneath the ground and makes its way back to the surface.
- **High Dam Release:** High dam release flooding is caused by intentional water release from dams to prevent water from breaching a spillway or the ends of the dam. A high dam release is typically a slow release of water from the dam over time but can cause flooding in surrounding areas.
- **Ice Jams:** Flooding can also result from ice jamming or blockage along streams. Ice breaking up into pieces, called flows, move along with the flowing rivers or streams. The ice flows can jam at curves, narrow places in the channel, structures, river/stream confluences, or where there is a sharp decrease in riverbed gradient, creating an effective dam that produces water backup and

overflow. Ice jams can cause considerable increases in upstream water levels, while at the same time downstream water levels may drop.

- Levee/Floodwall Failure:** Levees are earth embankments constructed along rivers and coastlines to protect adjacent lands from flooding. Floodwalls are concrete structures, often components of levee systems, designed for urban areas where there is insufficient room for earthen levees. Levees are usually engineered to withstand a flood with a computed risk of occurrence. When a larger flood occurs and/or levees and floodwalls and their appurtenant structures are stressed beyond their capabilities to withstand floods, levee failure can result in loss of life and injuries as well as damage to property, the environment, and the economy.
- Overland Flooding:** Overland Flooding occurs when flood waters flow overland from an outside source or body of water onto dry land and seeps into buildings and/or infrastructure.
- Riverine Flooding:** Riverine flooding originates from a body of water, typically a river, creek, or stream, as water levels rise onto normally dry land. Most riverine floods are slow developing events with a natural, predictable source of water or moisture, such as snowmelt, slow rain, or a controlled dam release. This type of flood can often be forecast based on the amount of moisture or water available. The timing and location of flood conditions can often be calculated to a reasonable degree. If implemented in a timely manner, protective measures can sometimes mitigate potential damage and losses.

Seasonal Pattern	More frequent during spring and summer with thawing of winter snow pack and summer rainfall. Fall flooding occurs on very rare occasions. Spring and winter flooding can occur from ice jams in culverts and local bodies of water.
Duration	Several hours for flash flooding; up to 2 weeks or several months depending on severity for major overland flooding.
Speed of Onset	Minutes for flash flooding. Between 12 and 24 hours warning for closed basin, riverine, and overland flooding.
Location	<p>Low-lying areas near or adjacent to bodies of water, or with inadequate drainage. Private and public low-water crossings. Closed basins.</p> <p><u>Eddy County.</u> James River, Kelly Creek, Rocky Run Creek, and Sheyenne River. Topography of the count is flat with no low-lying areas conducive to overland flooding.</p> <ul style="list-style-type: none"> • Drainage ditches near the Garrison Diversion/New Rockford Canal <p><u>Wells County.</u> James River, Pipestem Creek, Rocky Run Creek, Sheyenne River.</p> <ul style="list-style-type: none"> • County highways and townships roads included in presidential disaster declarations. See the risk assessment section of this chapter. • Five (5) bridges and railroad grade raise west of city of Bowdon <p><u>Incorporated Jurisdictions.</u> See Chapter 8, Jurisdictions. Smaller incorporated jurisdictions lack (except the cities of Harvey, Sheyenne, and New Rockford) underground stormwater drainage systems as surface streets act as the drainage system.</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>

DRAFT

4.7.1.1 Flood – Eddy County, North Dakota

History

Information on the history of flooding in Eddy County was obtained from the Federal Emergency Management Agency (FEMA); National Climatic Data Center (NCDC); National Oceanic and Atmospheric Administration (NOAA); Eddy County Office of Emergency Management; 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, Eddy County has had 23 Presidential Disaster Declarations, of which 13 were for flooding. Flooding accounts for or is a factor in approximately 56.5 percent of disasters declared in Eddy County.

National Climatic Data Center/National Oceanic and Atmospheric Administration

Table 4.7.1.1 summarizes the history of flooding in Eddy County between January 1, 1996, and December 31, 2022. 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. A detailed hazard history for Eddy 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.

- Eddy County experienced 26 occurrences of flooding resulting in approximately one incident of significance approximately every other year.
- Approximately \$217,000.00 in property damage and \$25,000.00 in crop damage was reported.
- No injuries or fatalities were reported.

Table 4.7.1.1 – 1996 to 2022 Eddy County, North Dakota Flood Hazard History Summary

Occurrences	Fatalities	Injuries	Property Damage	Crop Damage
26	0	0	\$217,000.00	\$25,000.00

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

Eddy County Emergency Management

Table 4.7.1.2 illustrates public infrastructure damage information from presidential disaster declarations from flooding in Eddy County between 2009 and 2020. The following are key points.

- **DR-1829.** A total of 44 damaged projects were identified from the Spring 2009 flood declaration totaling \$429,397.63. The cost share was approximately seven percent local, seven percent state, and 87.0 percent federal. The average cost per damaged project was \$9,759.04.

- **DR-1907.** A total of five damaged projects were identified from the Spring 2010 flood declaration totaling \$63,080.19. The cost share was approximately 15.0 percent local, 10.0 percent state, and 75.0 percent federal. The average cost per damaged project was \$12,616.04.
- **DR-1981.** A total of five damaged projects were identified from the Spring 2011 flood declaration totaling \$817,351.64. The cost share was approximately three percent local, seven percent state, and 90.0 percent federal. The average cost per damaged project was \$35,537.03.
- **DR-4118.** A total of five damaged projects were identified from the Spring 2013 flood declaration totaling \$14,065.54. The cost share was approximately three percent local, seven percent state, and 90.0 percent federal. The average cost per damaged project was \$827.38.
- **DR-4190.** A total of 27 damaged projects were identified from the Spring 2014 flood declaration totaling \$139,488.03. The cost share was approximately 15.0 percent local, 10.0 percent state, and 75.0 percent federal. The average cost per damaged project was \$5,166.22.
- **DR-4475.** A total of 12 damaged projects were identified from the Spring 2019 fall declaration totaling \$29,738.30. The cost share was approximately seven percent local, three percent state, and 90.0 percent federal. The average cost per damaged project was \$2,478.19.
- **DR-4509.** The Spring 2019 flood declaration totaling \$9,929.01.

Table 4.7.1.2 2009 to 2022 Eddy County, North Dakota Public Infrastructure Damages from Presidentially Declared Disaster – Flooding Events

Disaster	Year	Projects/Sites	Local Share	State Share	Federal Share	Grade Raises	Total Cost
DR-1829	2009	44	\$28,459.22	\$28,892.55	\$372,045.86	0	\$429,397.63
DR-1907	2010	5	\$9,462.05	\$6,308.06	\$47,310.08	0	\$63,080.19
DR-1981	2011	23	\$24,520.55	\$57,214.61	\$735,616.48	4	\$817,351.64
DR-4118	2013	20	\$2,482.15	\$1,654.77	\$12,410.77	0	\$16,547.69
DR-4190	2014	27	\$20,923.20	\$13,948.80	\$104,616.03	0	\$139,488.03
DR-4475	2019	12	\$2,081.68	\$892.15	\$26,764.47	0	\$29,738.30
DR-4509	2019-	NA	--	--	\$9,929.01	NA	NA

*The declaration is considered a Severe Summer Weather event that resulted in flooding.
 Source(s): Eddy County Auditor’s Office; Eddy County Commission; Eddy 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 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, Eddy County experienced nine incidents of crop loss due to flooding impacting approximately 333.38 acres of crops totaling \$30,951.00 in losses.**

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

According to the 2018 N.D. Enhanced Mitigation MAOP, the following historical information was obtained on flooding events in Eddy County.

- According to the National Centers for Environmental Information, as of 2018, Eddy County experienced 15 flash flood events resulting in \$202,000.00 in property damage, \$25,000 in crop damage, and no injuries or fatalities. In addition, as of 2018, Eddy County experienced 10 flood events resulting in \$15,000.00 in property damage and no crop damage. No injuries or fatalities were reported.

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 a flood in Eddy County as ‘likely,’ meaning there is between a 10 and 100 percent probability in the next year of an incident. The probability of flood in Eddy County can be determined through data provided by the National Climatic Data Center/National Oceanic and Atmospheric Administration; Eddy County Auditor’s Office and Eddy County Highway Department; the U.S. Dept. of Agriculture, Risk Management Agency; the 2018 N.D. Enhanced Mitigation MAOP, and Eddy County Emergency Management. The N.D. Dept. of Water Resources has a flood risk mapping service. Figures 4.7.1.1 to 4.7.1.1 illustrate the base level engineering for flood risk for the cities of New Rockford and Sheyenne.

National Climatic Data Center/National Oceanic and Atmospheric Administration

Per Table 4.7.1.1, the following statistics on the probability of flooding in Eddy County is as follows:

- Eddy County experienced 26 occurrences of flooding resulting in approximately one incident of significance annually.
- Approximately \$217,000.00 in property damage and \$25,000.00 crop damage was reported.
- No injuries or fatalities were reported.

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

- According to information obtained from the U.S. Dept. of Agriculture, Risk Management Agency (RMA), Eddy County experiences \$1,473.86 in losses due to flooding annually.

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

- Figure 4.7.1.7 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 (100-Year) Floodplain is present in northern Eddy 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. Profile meeting participants and the Steering Committee indicated the extent/magnitude of a flood in Eddy County as catastrophic meaning that more than 50 percent of the jurisdiction, its people and property can be impacted. Based on history of flooding in Table 4.7.1.1 (National Climatic Data Center), Table 4.7.1.2, and crop loss information from the USDA-RMA, the following extent/magnitude of flooding in Eddy County is determined.

- Per Table 4.7.1.1, and the hazard history for Eddy County, approximately \$100,000 in property damage occurred from a flood event on June 12, 2000, in unincorporated Hamar and the city of New Rockford.
- Per Table 4.7.1.2, the largest flooding event in terms of total monetary damage was DR-1981 with \$817,351.64 in damages, which was also the largest in terms of average cost per damaged project with \$35,537.03 per project. The largest flooding event in terms of total damaged projects was DR4190 with 27 damaged projects.

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

- Crop loss data from the USDA, RMA shows no crop loss due to flooding prior to 2001.

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 4.7.1.3 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 damage because of a 1-percent chance flood.

- New development must not cause an increase in flood damage to other property.
- The DFIRMs for Eddy County can be found on a disc located at the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment.
- 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 4.7.1.3 – Participation in National Flood Insurance Program (NFIP) – Eddy County, ND

Jurisdiction Name	CID #	Initial FHBM Identified	Initial FIRM Identified	Mapped
Eddy County	380694	NA	NA	(NSFHA)
City of New Rockford	380031	11/23/73	06/01/98	06/01/98(L)

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 15, 2022, Per the NFIP, as of June 16, 2016, there are two NFIP policies in Eddy County with total coverage of \$48,800. Since 1978, seven claims have been made totaling \$45,095 in payments.

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.

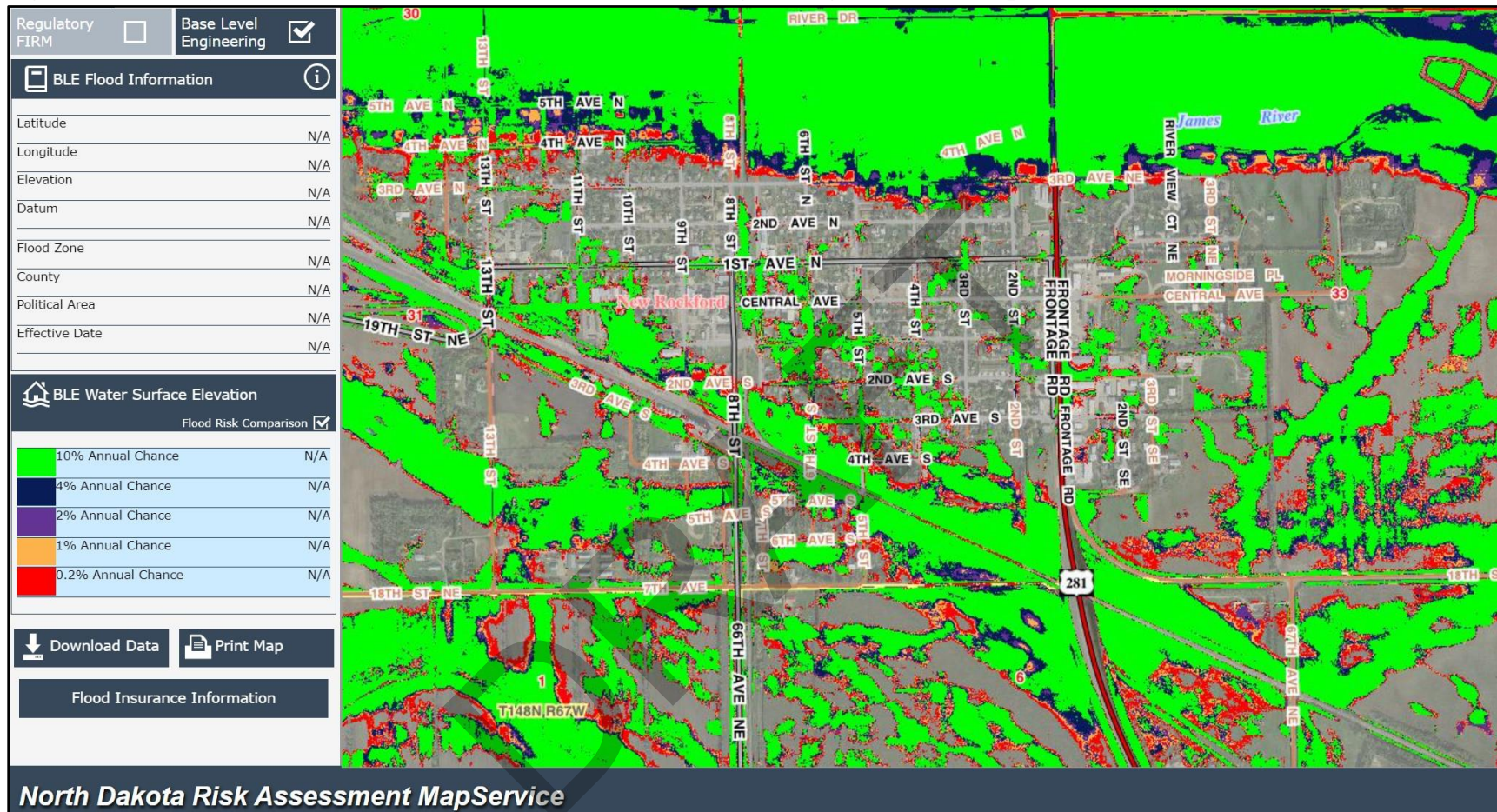
As of March 28, 2023, there are no repetitive loss properties in Eddy County.

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 of March 28, 2023, there are no severe repetitive loss properties were in Eddy County.

Figure 4.7.1.1– City of New Rockford, North Dakota Base Level Engineering Flood Risk Map



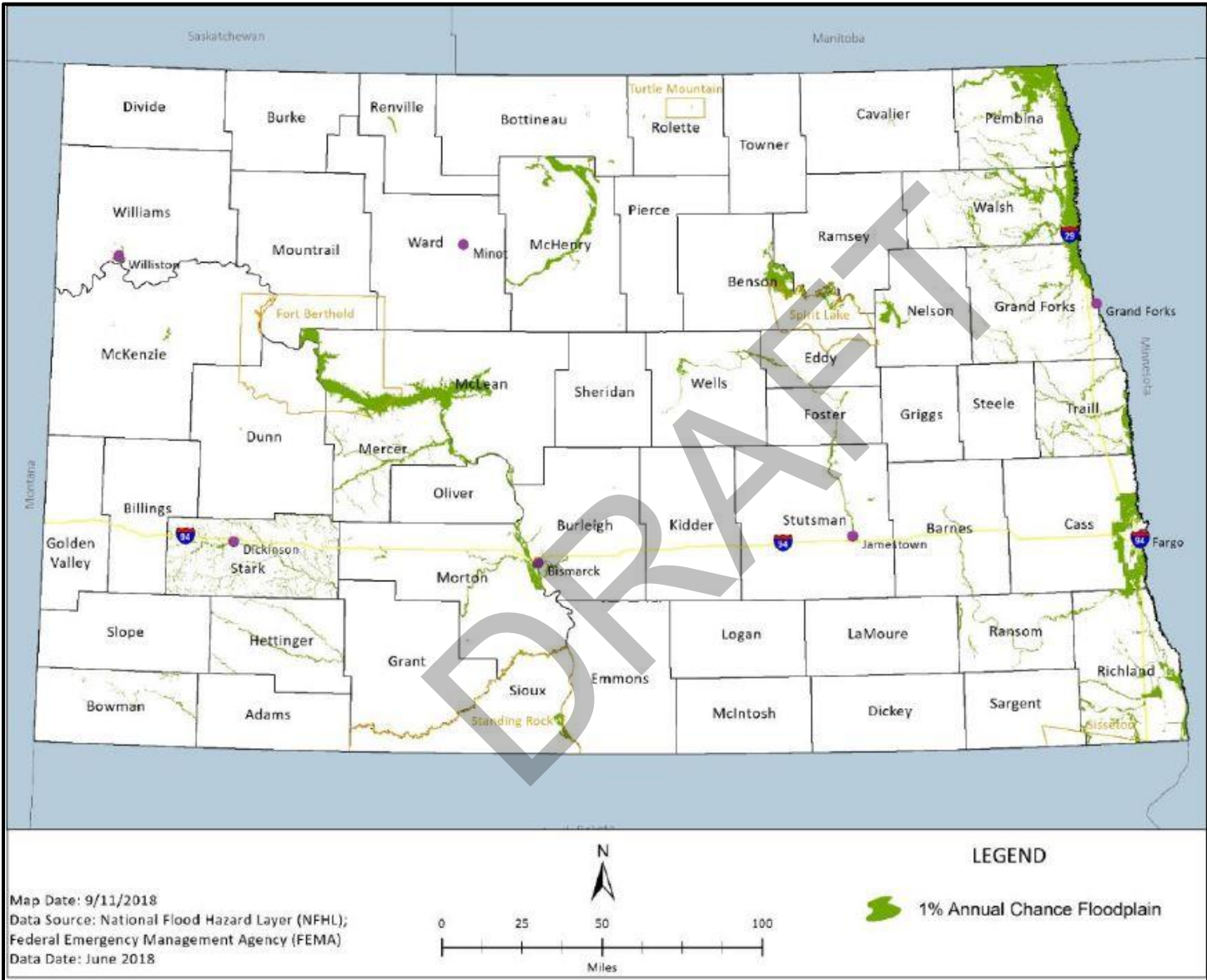
Source(s): N.D. Risk Assessment MapService

Figure 4.7.1.2 – City of Sheyenne, North Dakota Base Level Engineering Flood Risk Map



Source(s): N.D. Risk Assessment MapService

Figure 4.7.1.7 – 2019 North Dakota One-Percent Annual Chance (100-Year) Floodplain



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

Risk Assessment

Table 4.7.1.3 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 4.7.1.3 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 4.7.1.3 – Eddy County, North Dakota Flood Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Eddy County	4	3	4	3	2	12
City of New Rockford	4	3	4	2	1	12
City of Sheyenne	3	2	2	2	1	8

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

Table 4.7.1.4 provides information on the specific impact, frequency, likelihood, vulnerability and capability of flood in Eddy 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

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, whether a direct impact to the structure or through secondary affects. The Eddy County Road Department shops are not located on high points throughout the county and therefore are vulnerable to flooding.

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

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. **The Steering Committee identified lift stations and roads located in low-lying areas are the most vulnerable to flooding**

An inventory of critical facilities and infrastructure is provided in Chapter 3, Profile and Inventory.

Vulnerabilities to New and Future Development

New and future development in Eddy County is at high risk of flooding if allowed in a floodplain. With projected local populations stable in Eddy County through 2030, the vulnerability to flooding will not change if development is restricted from flood-prone areas.

Flood mapping helps determine which areas are flood-prone and not suitable for development. New and future development in Eddy County is more vulnerable to flooding as it does not have flood maps with enough detail to assist the county and cities in planning for future growth accordingly. However, with the completion of the updated FEMA flood maps through the N.D. Dept. of Water Resources, vulnerabilities to new and future development from flooding will be easier to identify.

Data Limitations

The lack of digitized records of public assistance provided to local governments from flood events makes collection and analysis of impacts from the hazard difficult to comprehend during mitigation planning processes.

National Climatic Data Center/National Oceanic and Atmospheric Administration

The hazard history provided in terms of property damage and crop damage (which are only estimates) is calculated based on what the National Weather Service received from insurance companies and individual property owners upon request. Both sources have been reluctant to share that information. Therefore, both practices were discontinued. Because of this, the National Weather Service makes a best guess using all available data at the time of the publication. The damage amounts are received from a variety of sources. Property and crop damage should be considered as a broad estimate.

In addition, the hazard history provided through the National Climatic Data Center/National Oceanic Atmospheric Administration's Storm Events Database contains data from **1950 to 2021**, 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 tornadoes, 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.

Table 4.7.1.4 – Eddy County, North Dakota Flood Risk Assessment

<p>Impact</p>	<ul style="list-style-type: none"> • Roads can become washed out and limit access for emergency services and economy activity • Loss of economy resulting from crop damage • Increased mosquitos-may transmit disease due to lots of grass and standing water • Large property loss, equipment/vehicles, personal property • Can impact lift stations and cause sewer backups contributing to infectious disease • Power outages, sometimes prolonged • Damage to critical facilities and infrastructure • Potential loss of life from fast moving water • Homes with basements can become flooded from ground saturation/seepage • Temporary displaced populations • Temporary relocation of medical services would decrease range of services offered • Increased crime as emergency services are limited in access and mobility • Increase in infectious disease from overland flooding and standing water (mold and blue/green algae) • Cause of secondary hazards such as shortage or outage of critical materials or infrastructure, transportation incidents, and/or adversarial activity • 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 • Potential for permanent closure of county and township roads • Compromised/diminished water quality from agricultural runoff carried by flood waters <ul style="list-style-type: none"> • \$252,290.00 in losses paid on one claim through the NFIP since 1978 in Eddy County. • Between January 1, 2001, and December 31, 2020, Eddy County experienced nine incidents of crop loss due to flooding. • Per Table 4.7.1.2, the largest flooding event in terms of total monetary damage was DR-1981 with \$817,351.64 in damages, which was also the largest in terms of average cost per damaged project with \$35,537.03 per project. The largest flooding event in terms of total damaged projects was DR4190 with 27 damaged projects. • According to the 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP), Eddy County has one county bridge that experiences scouring from flooding. <p><u>Blocked Roads</u></p> <ul style="list-style-type: none"> • None identified at the time of this plan update. • 61st Ave NE near unincorporated Munster in James River Valley
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Table 4.7.1.4 – Eddy County, North Dakota Flood Risk Assessment – Continued

<p>Frequency</p>	<ul style="list-style-type: none"> • Annual occurrences of localized flooding of streets in incorporated cities, and bi-annual flooding of county and township roads • Periodic flash flooding from heavy rains in the summer • Overland flooding from increased heavy rains in the summer and snow melt in the spring occurring each year to varying degrees of severity • Increasing irregularity in precipitation patterns 	<ul style="list-style-type: none"> • Agricultural land management practices to maximize production can impact the severity flooding • Presidential Disaster Declarations in Eddy County in 2009, 2011 (twice), 2013, 2014, and 2020 • Per Table 4.7.1.1, probability of flooding in Eddy County is approximately one incident of significance approximately every other year based on 26 flood occurrences between 1996 and 2022
<p>Likelihood</p>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> • James River, Rocky Run Creek, Sheyenne River • Rapid change of seasons = excessive snow melt/drainage • Low spots on county and township roads • High water table in unincorporated Hamar • Prevalence of impervious surfaces and pavement increases runoff and decreases water absorbed naturally • A large portion of eastern Eddy County has sandy soil which contributes to rapid drainage of runoff • Farm and field drain tile and dewatering systems 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> • Likelihood dependent local weather and climate patterns • Upgraded culverts installed from federal funding received during presidential disaster declarations • Lack of wet closed basins • A large portion of the eastern geographic expanse of Eddy County has sandy soil which contributes to rapid drainage of runoff • Farm and field drain tile and dewatering systems
<p>Vulnerability</p>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • James River, Rocky Run Creek, Sheyenne River -- flooding results in shutting down of roads, loss of infrastructure (bridges and culverts) – U.S. Highway 281 Bridge over James River in New Rockford and over the Sheyenne River near the city of Sheyenne • Ditches near Garrison Div./New Rockford Canal • Lack of storm water system in smaller jurisdictions • Multiple severe weather systems occurring close together further inundating existing flooding impacts • Limited local financial resources to accomplish projects independently during Presidential Disaster Declarations 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • LiDAR and constant improvements in technology is available for flood mapping. The DWR is currently updating all DFIRMS through a FEMA grant. • Advanced warning systems such as IPAWS, cell phones, internet, and TV for flash flooding events • Road raises have been completed and properties have been removed from flood prone areas – ongoing based on current conditions and impacts • Upgraded culverts installed from federal funding received during presidential disaster declarations • Eddy County and the city of New Rockford enrolled in the NFIP

Table 4.7.1.4 – Eddy County, North Dakota Flood Risk Assessment – Continued

Capability	<p><u>Administrative and Technical</u></p> <ul style="list-style-type: none"> • FEMA Flood Maps – being updated through a federal grant managed by the N.D. Dept. of Water Resources to include enhanced aerial imagery and the base level engineering data • Active County Commission and City Council(s) • Contracts for engineering, planning, and grant writing • GIS services are provided by county engineering contract • Eddy County with GIS capabilities through their engineering contract • Eddy County Water Resource District Board • ND Dept. of Water Resources - ND Risk Assessment Mapping (NDRAM) • Administration of Public Assistance (PA) funding through FEMA from Presidential Disaster Declarations • Eddy County Road Superintendent
	<p><u>Education and Outreach</u></p> <ul style="list-style-type: none"> • Active emergency management department with education and outreach capabilities • Social media accounts – Eddy County News, Eddy County Emergency Management, Sheriff’s Office • Eddy County Water Resource District Board provides regulation to land-owners for issues pertaining to water
	<p><u>Financial</u></p> <ul style="list-style-type: none"> • Relies on federal and state entities for assistance with major projects • Public Assistance (PA) funding through FEMA from Presidential Disaster Declarations
	<p><u>Planning and Regulatory</u></p> <ul style="list-style-type: none"> • Eddy County and City of New Rockford adopted NFIP, are enrolled and have flood plain ordinances • Eddy County Water Resource District Board • Eddy County Planning and Zoning Committee and Administrator • Eddy County Floodplain Administrator • Eddy County adopted NFIP and has flood plain ordinances • ND Dept. of Water Resources - ND Risk Assessment Mapping (NDRAM) • ND Dept. of Water Resources also has regulations in place for surface water • USDA, Natural Resource Conservation Service (NRCS) • USDA, Farm Services Agency (FSA)

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)
- Eddy County Comprehensive Plan (2014)
- Eddy County Evacuation Plan through Eddy County Emergency Management
- Eddy County Local Emergency Operations Plan
- Eddy County Mass Care through Eddy County Emergency Management
- Eddy County Shelter Plan through Eddy County Emergency Management
- Eddy County Threat and Hazard Identification and Risk Assessment (THIRA)
- Eddy County Zoning Ordinance (2014)
- National Flood Insurance Program (and required flood ordinances)
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan, Flood Annex
- North Dakota Dept. of Water Resources Risk Assessment Mapping (NDRAM) Service (flood mapping software)
- 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)

4.7.2.1 Flood – Wells County, North Dakota

History

Information on the history of flooding in Wells County was obtained from the Federal Emergency Management Agency (FEMA); National Climatic Data Center (NCDC); National Oceanic and Atmospheric Administration (NOAA); Wells County Office of Emergency Management; 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, Wells County has had 27 Presidential Disaster Declarations, of which 13 were for flooding. Flooding accounts for or is a factor in approximately 48.1 percent of disasters declared in Wells County.

National Climatic Data Center/National Oceanic and Atmospheric Administration

Table 4.7.2.1 summarizes the history of flooding in Wells County between January 1, 1996, and December 31, 2022. 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. A detailed hazard history for Wells 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.

- Wells County experienced 16 occurrences of flooding resulting in approximately one incident of significance approximately every other year.
- Approximately \$3,479,000.00 in property damage and \$710,000.00 in crop damage was reported.
- No injuries or fatalities were reported.

Table 4.7.2.1 – 1996 to 2021 Wells County, North Dakota Flood Hazard History Summary

Occurrences	Fatalities	Injuries	Property Damage	Crop Damage
16	0	0	\$3,479,000.00	\$710,000.00

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

Wells County Emergency Management

Table 4.7.2.2 illustrates public infrastructure damage information from presidential disaster declarations from flooding in Wells County between 2009 and 2020. The following are key points.

- **DR-1829.** The Spring 2009 flood declaration totaled \$1,630,297.19. The cost share was approximately three percent local, seven percent state, and 90.0 percent federal.
- **DR-1907.** The Spring 2010 flood declaration totaled \$265,194.45. The cost share was approximately 15.0 percent local, 10.0 percent state, and 75.0 percent federal.
- **DR-1981.** The Spring 2011 flood declaration totaled \$2,212,513.39. The cost share was approximately three percent local, seven percent state, and 90.0 percent federal.

- **DR-4118.** A total of 254 damaged projects were identified from the Spring 2013 flood declaration totaling \$499,151.95. The cost share was approximately 15.0 percent local, 10.0 percent state, and 75.0 percent federal. The average cost per damaged project was \$1,965.17.
- **DR-4128.** A total of 111 damaged projects were identified from the Fall 2013 flood declaration totaling \$392,477.77. The cost share was approximately 15.0 percent local, 10.0 percent state, and 75.0 percent federal. The average cost per damaged project was \$3,535.84.
- **DR-4475.** A total of 264 damaged projects were identified from the Fall 2019 flood declaration totaling \$898,687.80. The cost share was approximately three percent local, seven percent state, and 90.0 percent federal. The average cost per damaged project was \$3,404.12.
- **DR-4565.** A total of six damaged projects were identified from the Spring 2020 flood declaration totaling \$31,184.51. The cost share was approximately three percent local, seven percent state, and 90.0 percent federal. The average cost per damaged project was \$5,197.42.
- **DR-4553.** A total of 19 damaged projects were identified from the Fall 2020 flood declaration totaling \$84,542.38. The cost share was approximately three percent local, seven percent state, and 90.0 percent federal. The average cost per damaged project was \$4,449.60.
- **DR-4660.** A total of 14 damaged projects were identified from the Spring 2022 flood declaration totaling \$43,960.60. The cost share was approximately 15.0 percent local, 10.0 percent state, and 75.0 percent federal. The average cost per damaged project was \$3,140.04.
- **DR-4686.** Details on this disaster declaration are forthcoming. However, preliminary numbers from Wells County Emergency Management indicate \$20,838.25 for Wells County and \$6,121.79 for the city of Harvey.

Table 4.7.2.2 2009 to 2022 Wells County, North Dakota Public Infrastructure Damages from Presidentially Declared Disaster – Flooding Events

Disaster	Year	Projects/Sites	Local Share	State Share	Federal Share	Grade Raises	Total Cost
DR-1829	2009	--	\$49,383.84	\$113,821.97	\$1,467,091.38	0	\$1,630,297.19
DR-1907	2010	--	\$39,779.13	\$26,519.47	\$198,895.85	0	\$265,194.45
DR-1981	2011	--	\$66,375.40	\$154,875.99	\$1,991,262.23	13	\$2,212,513.39
DR-4118	2013	254	\$74,872.78	\$49,915.20	\$374,363.97	0	\$499,151.95
DR-4128	2013	111	\$58,871.65	\$39,247.79	\$294,358.33	0	\$392,477.77
DR-4475	2019	264	\$59,912.48	\$25,676.83	\$813,098.49	0	\$898,687.80
DR-4565	2020	6	\$2,078.96	\$890.99	\$28,214.56	0	\$31,184.51
DR-4553	2020	19	\$5,636.15	\$2,415.50	\$76,490.73	0	\$84,542.38
DR-4660	2022	14	\$6,594.09	\$4,396.06	\$32,970.45	0	\$43,960.60
DR-4686	2022	NA				NA	

Source(s): N.D. Dept. of Emergency Services; Wells County Auditor’s Office; Wells County Commission; Wells 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 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, 2022, Wells County experienced six incidents of crop loss due to flooding impacting approximately 183.62 acres of crops totaling \$9,059.00 in losses.**

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

According to the 2018 N.D. Enhanced Mitigation MAOP, the following historical information was obtained on flooding events in Wells County.

- According to the National Centers for Environmental Information, as of 2018, Wells County experienced seven flash flood events resulting in \$159,000.00 in property damage, \$10,000 in crop damage, and no injuries or fatalities. In addition, as of 2018, Wells County experienced five flood events resulting in \$2,450,000.00 in property damage and no in crop damage. No injuries or fatalities were reported.

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 a flood in Wells County as “likely,” meaning there is between a 10 and 100 percent probability in the next year of an incident. The probability of flood in Wells County can be determined through data provided by the National Climatic Data Center/National Oceanic and Atmospheric Administration; Wells County Auditor’s Office and Wells County Highway Department; the U.S. Dept. of Agriculture, Risk Management Agency; the 2018 N.D. Enhanced Mitigation MAOP, and Wells County Emergency Management. The N.D. Dept. of Water Resources has a flood risk mapping service. **Figures 4.7.2.1 to 4.7.2.7 illustrate the base level engineering for flood risk for the cities of Bowdon, Cathay, Fessenden, Hamberg, Harvey, Hurdsfield, and Sykeston in Wells County.**

National Climatic Data Center/National Oceanic and Atmospheric Administration

Per Table 4.7.2.1, the following statistics on the probability of flooding in Wells County is as follows:

- Wells County experienced 16 occurrences of flooding resulting in approximately one incident of significance approximately every other year.
- Approximately \$128,851.85 in property damage and \$26,296.30 in damages annually.
- No injuries or fatalities were reported.

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

- According to information obtained from the U.S. Dept. of Agriculture, Risk Management Agency (RMA), Wells County experiences \$431.38 in losses due to flooding annually.

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

- Figure 4.7.2.7 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 (100-Year) Floodplain is present in Wells County along the James River.

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. Profile meeting participants and the Steering Committee indicated the extent/magnitude of a flood in Wells County as catastrophic meaning that more than 50 percent of the jurisdiction, its people and property can be impacted. Based on history of flooding in Table 4.7.2.1 (National Climatic Data Center), Table 4.7.2.2, and crop loss information from the USDA-RMA, the following extent/magnitude of flooding in Wells County is determined.

- According to the detailed hazard history for Wells County from the National Climatic Data Center, approximately \$2,400,000.00 in property damage occurred from a flood event on April 1, 2009, in the city of Harvey.
- Per Table 4.7.2.2, the largest flooding event in terms of total monetary damage was DR-1829 with \$1,630,297.19. The largest flooding event in terms of cost per site was DR-1981 with \$170,193.00 per site. The largest flooding event in terms of total damaged projects was DR-4475 with 264 damaged projects.

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

- Crop loss data from the USDA, RMA shows no crop loss due to flooding prior to 2001.

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. 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 4.7.2.3 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 damage because of a 1-percent chance flood.
- New development must not cause an increase in flood damage to other property.
- The DFIRMs for Wells County can be found on a disc located at the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment.
- 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 4.7.2.3 – Participation in National Flood Insurance Program (NFIP) – Wells County, ND

Jurisdiction Name	CID #	Initial FHBM Identified	Initial FIRM Identified	Mapped
City of Fessenden	380226	01/17/75	NA	(NSFHA)
City of Harvey	380231	01/24/75	08/05/86	08/05/86(M)
City of Sykeston	380207	01/17/75	NA	(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 15, 2022, there are two NFIP policies in Wells County with total coverage of \$48,800. Since 1978, seven claims have been made totaling \$45,095 in payments.

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 of March 28, 2023, there are no repetitive loss properties in Wells County.

NFIP Severe Repetitive Loss Properties

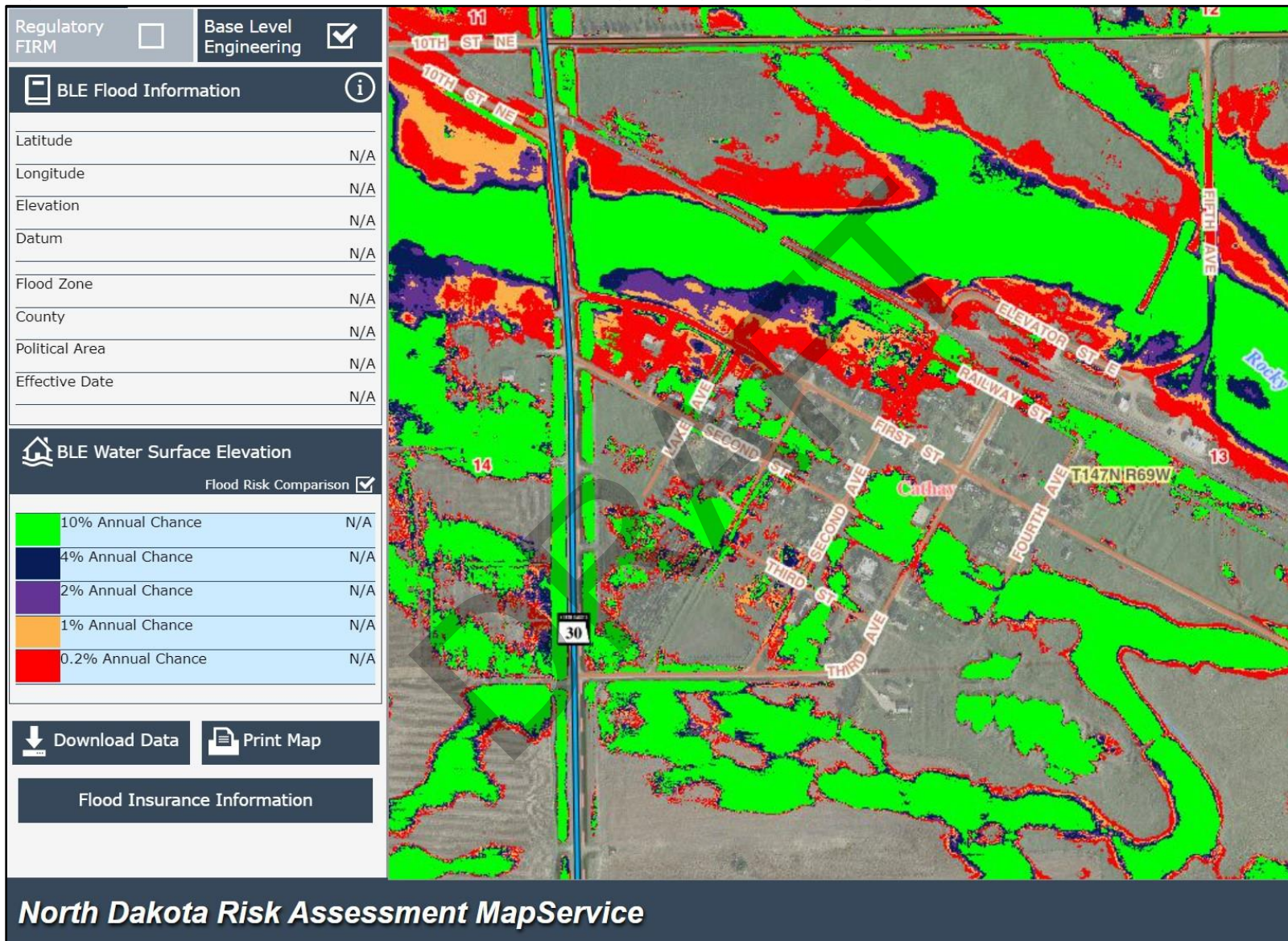
A Severe Repetitive Loss (SRL) property is a residential property that has had at least four NFIP claim payments over \$5,000 each with two such claims occurring within any ten-year period, or residential property that has had at least two separate claim payments within any ten-year period that have cumulatively exceeded the value of the property. As of March 28, 2023, there are no severe repetitive loss properties in Wells County.

Figure 4.7.2.1 – City of Bowdon, North Dakota Base Level Engineering Flood Risk Map



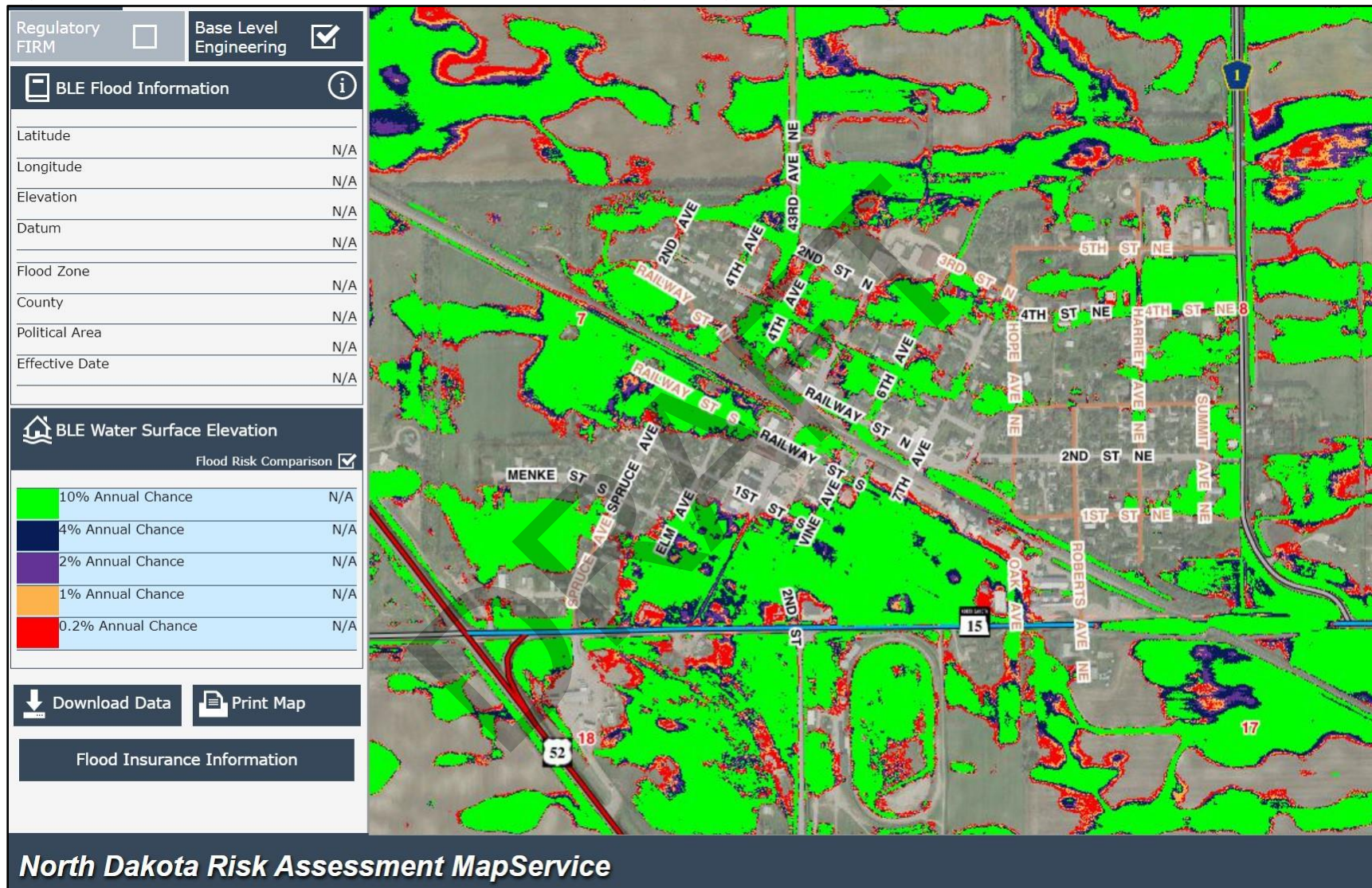
Source(s): N.D. Risk Assessment MapService (NDRAM)

Figure 4.7.2.2 – City of Cathay, North Dakota Base Level Engineering Flood Risk Map



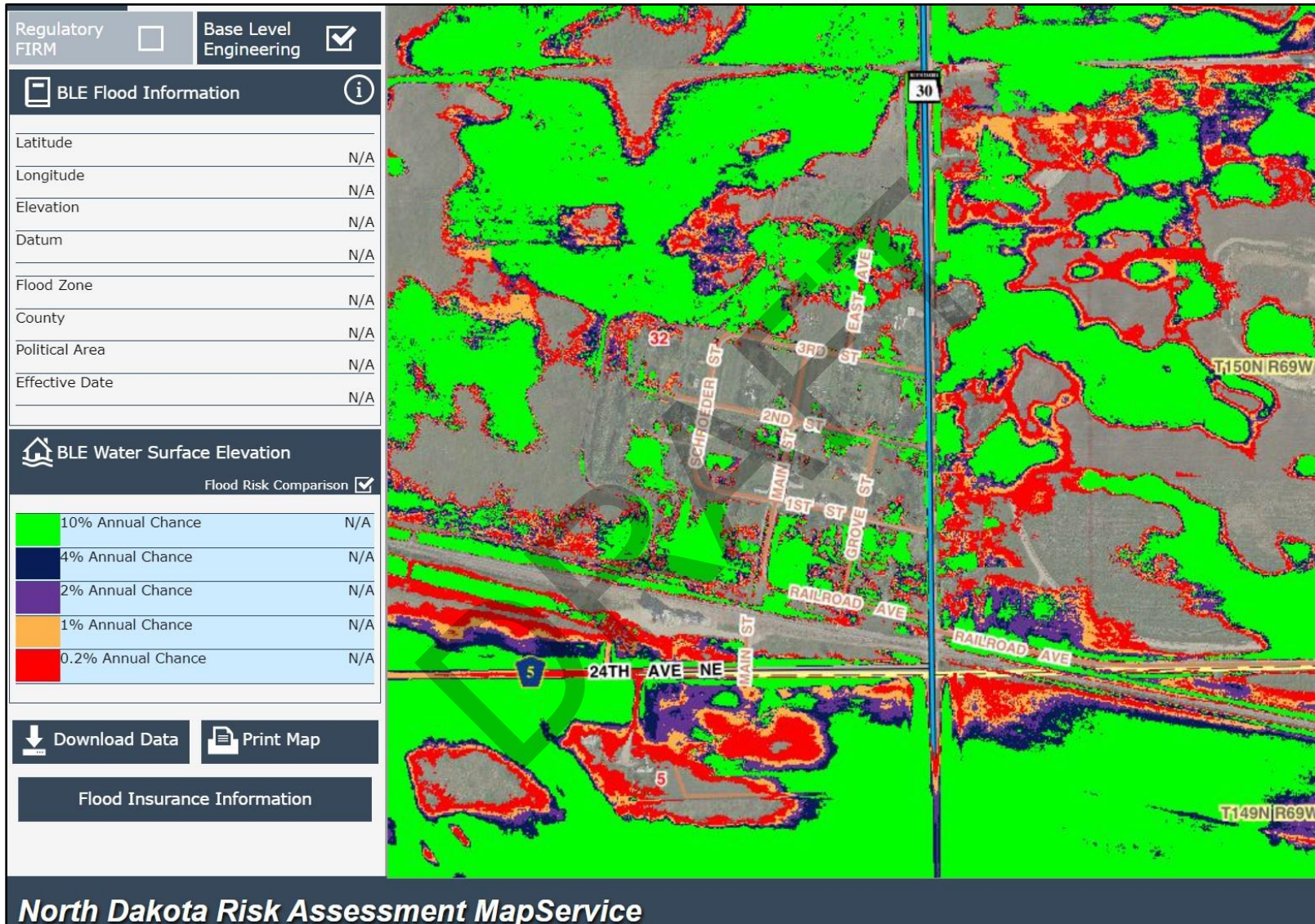
Source(s): N.D. Risk Assessment MapService

Figure 4.7.2.3 – City of Fessenden, North Dakota Base Level Engineering Flood Risk Map



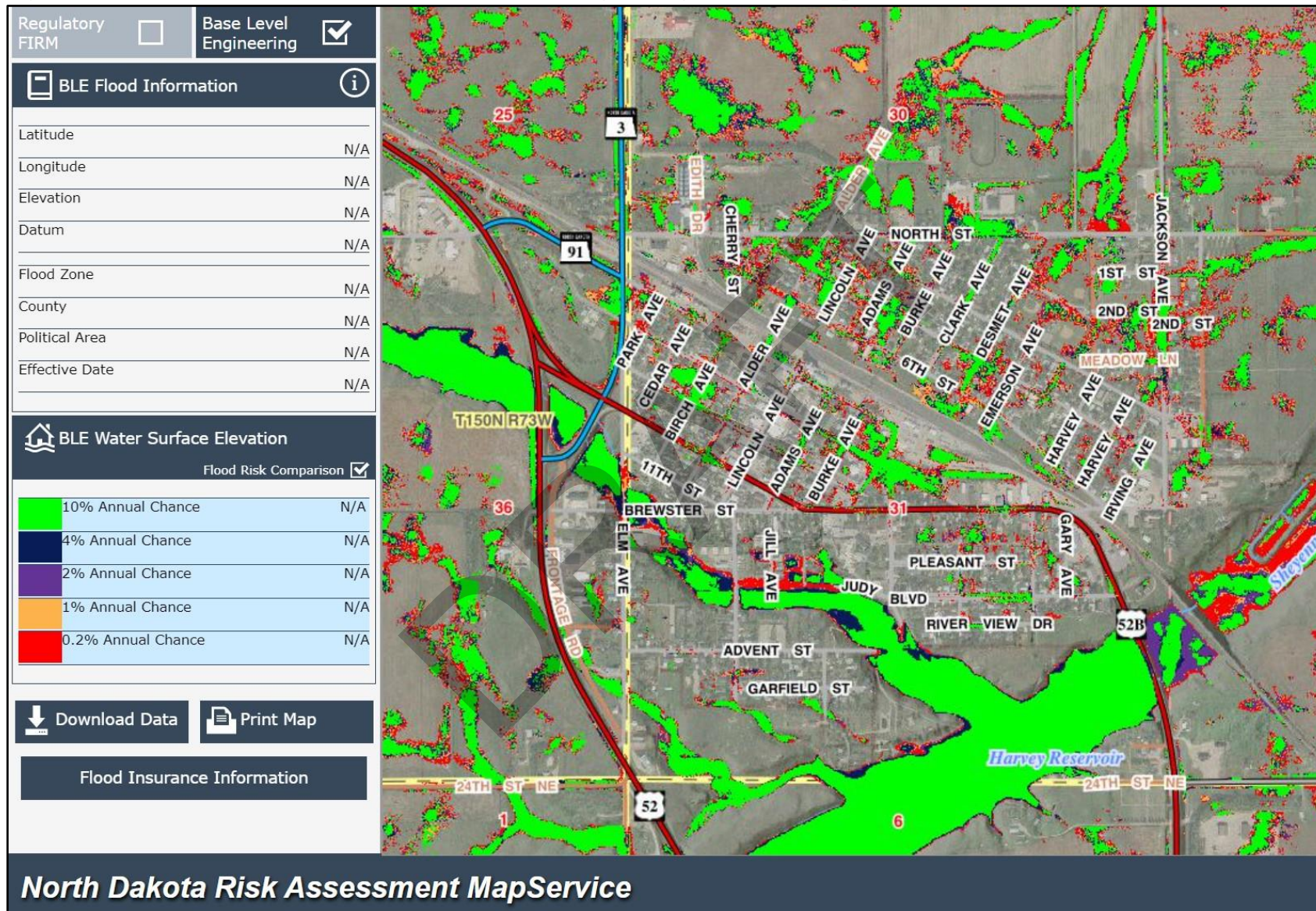
Source(s): N.D. Risk Assessment MapService

Figure 4.7.2.4 – City of Hamberg, North Dakota Base Level Engineering Flood Risk Map



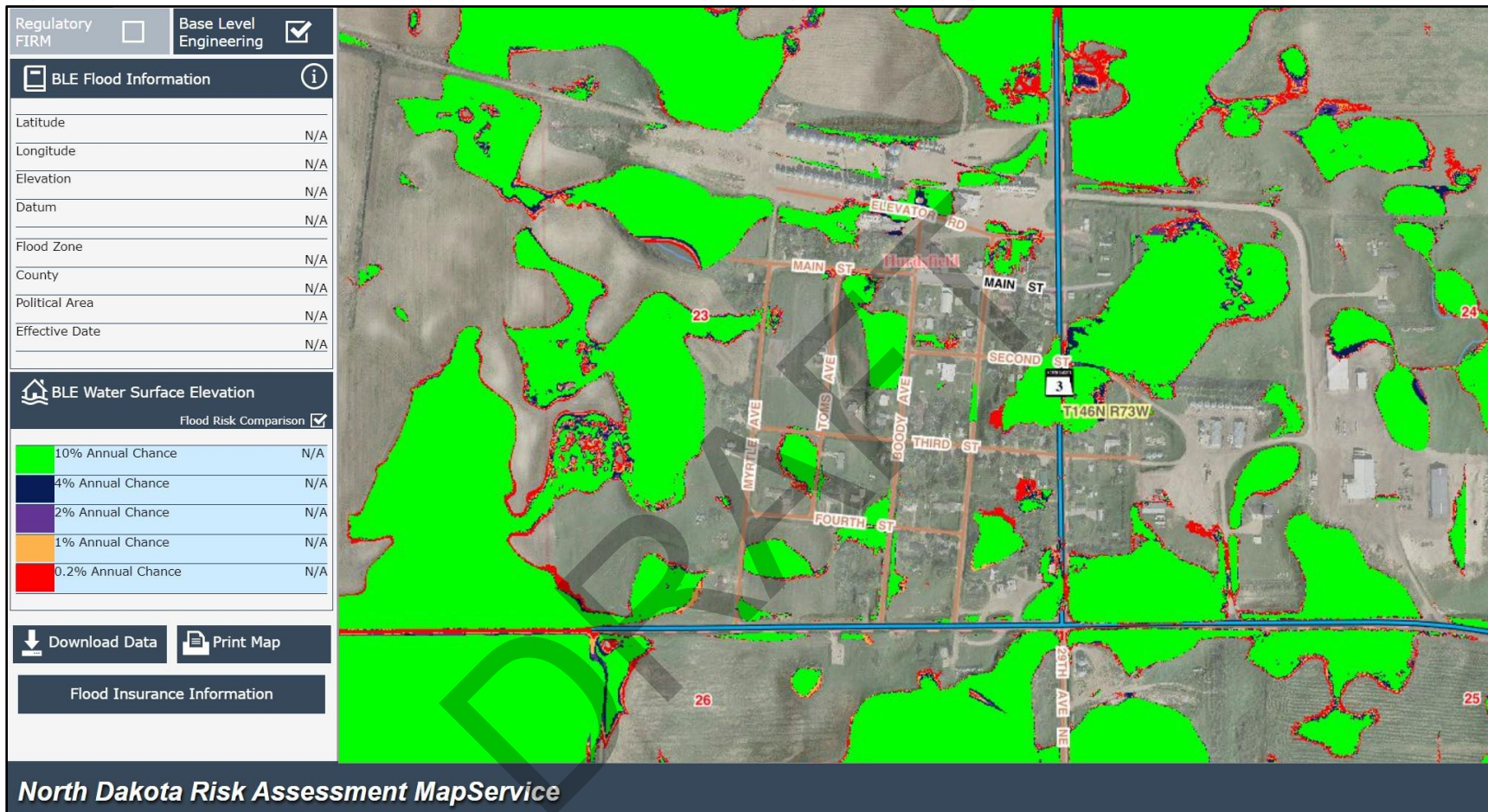
Source(s): N.D. Risk Assessment MapService

Figure 4.7.2.5 – City of Harvey, North Dakota Base Level Engineering Flood Risk Map



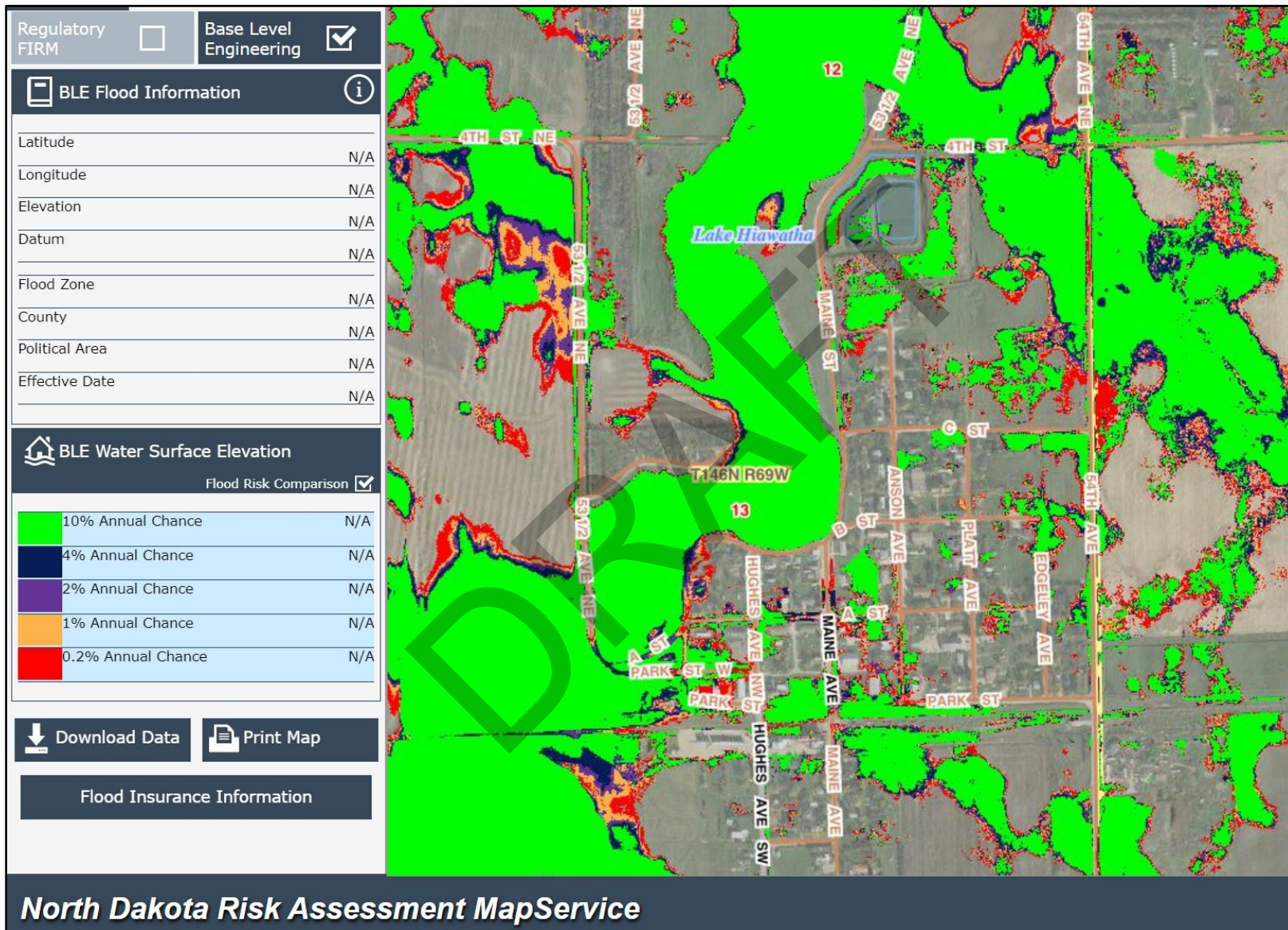
Source(s): N.D. Risk Assessment MapService

Figure 4.7.2.6 – City of Hurdsfield, North Dakota Base Level Engineering Flood Risk Map



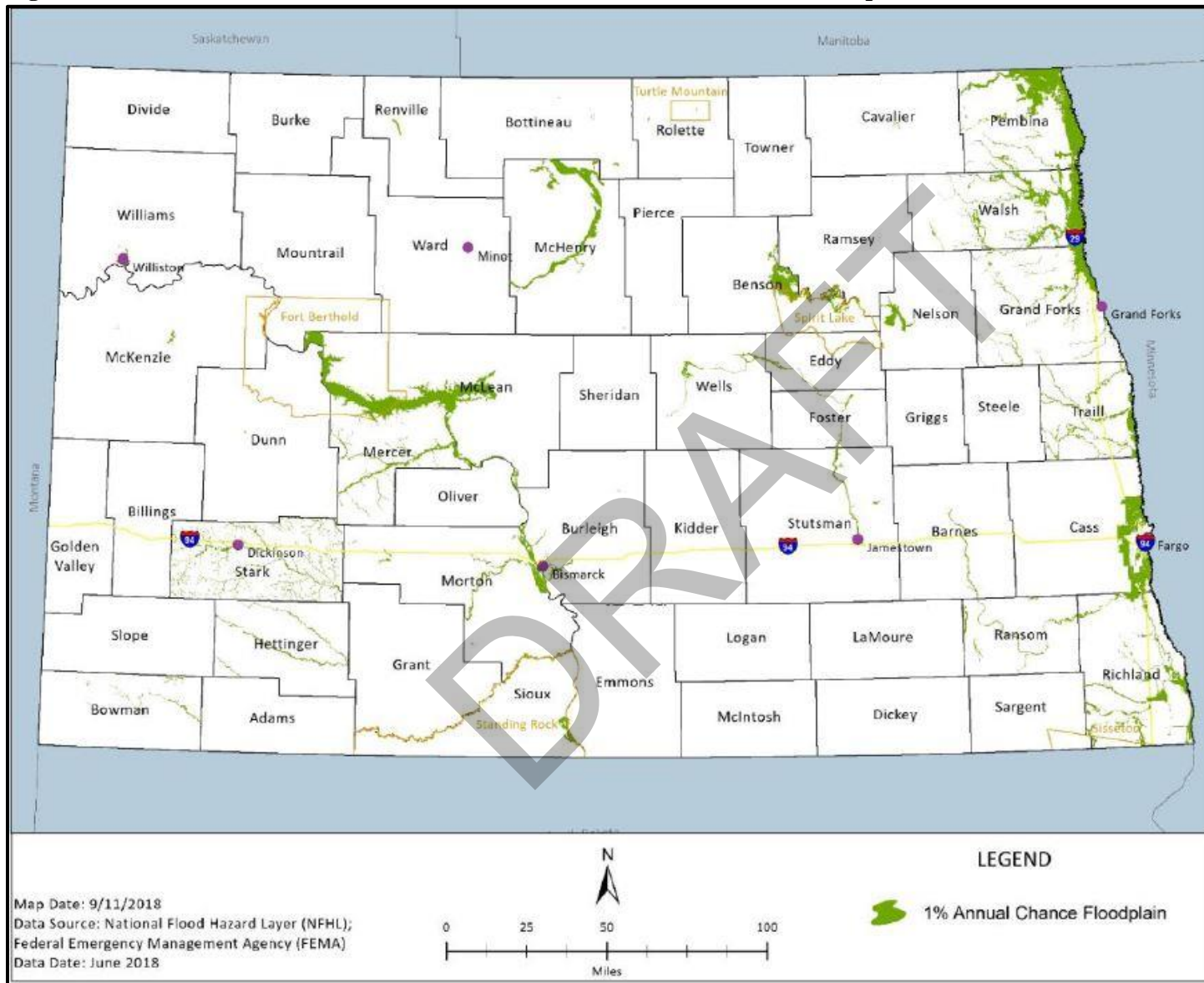
Source(s): N.D. Risk Assessment MapService

Figure 4.7.2.7 – City of Sykeston, North Dakota Base Level Engineering Flood Risk Map



Source(s): N.D. Risk Assessment MapService

Figure 4.7.2.7 – 2019 North Dakota One-Percent Annual Chance (100-Year) Floodplain



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

Risk Assessment

Table 4.7.2.3 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 4.7.2.3 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 4.7.2.3 – Wells County, North Dakota Flood Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Wells County	4	4	4	4	2	14
City of Bowdon	3	2	2	3	1	9
City of Cathay	3	2	2	3	1	9
City of Fessenden	4	3	4	3	1	13
City of Hamberg	3	2	2	3	1	9
City of Harvey	4	3	3	3	1	12
City of Hurdsfield	3	2	2	3	1	9
City of Sykeston	4	3	3	3	1	11

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

Table 4.7.2.4 provides information on the specific impact, frequency, likelihood, vulnerability and capability of flood in Wells 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 4.7.2.4 – Wells County, North Dakota Flood Risk Assessment

<p>Impact</p>	<ul style="list-style-type: none"> • Roads can become washed out and limit access for emergency services and economy activity • Loss of economy resulting from crop damage • Increased mosquitos-may transmit disease due to lots of grass and standing water • Large property loss, equipment/vehicles, personal property • Can impact lift stations and cause sewer backups contributing to infectious disease • Power outages, sometimes prolonged • Damage to critical facilities and infrastructure • Potential loss of life from fast moving water • Homes with basements can become flooded from ground saturation/seepage • Temporary displaced populations • Temporary relocation of medical services would decrease range of services offered • Increased crime as emergency services are limited in access and mobility • Increase in infectious disease from overland flooding and standing water (mold and blue/green algae) • Cause of secondary hazards such as shortage or outage of critical materials or infrastructure, transportation incidents, and/or adversarial activity • 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 • Potential for permanent closure of county and township roads • Compromised/diminished water quality from agricultural runoff carried by flood waters <ul style="list-style-type: none"> • \$252,290.00 in losses paid on one claim through the NFIP since 1978 in Wells County. • Between January 1, 2001, and December 31, 2022, Wells County experienced 16 incidents of crop loss due to flooding. • Per Table 4.7.2.2, the largest flooding event in terms of total monetary damage was DR-1829 with \$1,630,297.19. The largest flooding event in terms of cost per sit was DR-4565 with \$5,197.00 per site. The largest flooding event in terms of total damaged projects was DR-4475 with 264 damaged projects. • According to the 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP), Wells County has one county bridge that experiences scouring from flooding. <p><u>Blocked/Washed Out Roads</u></p> <ul style="list-style-type: none"> • During flood disasters, roads along the James River, Sheyenne River, Pipestem Creek, and Rocky Run Creek have the greatest risk of wash outs. Wells County Emergency Management said over the last decade, hundreds of road sites have experienced wash outs. • Five (5) bridges and railroad grade raise west of city of Bowdon.
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Table 4.7.2.4 – Wells County, North Dakota Flood Risk Assessment – Continued

<p>Frequency</p>	<ul style="list-style-type: none"> • Annual occurrences of localized flooding of streets in incorporated cities, and bi-annual flooding of county and township roads • Periodic flash flooding from heavy rains in the summer • Overland flooding from increased heavy rains in the summer and snow melt in the spring occurring each year to varying degrees of severity • Increasing irregularity in precipitation patterns • Agricultural land management practices to maximize production can impact the severity flooding 	<ul style="list-style-type: none"> • Presidential Disaster Declarations in Wells County in 2009, 2010, 2011, 2013 (2), 2019, 2020 (2), 2022 (1 flood and 1 snow) • Per Table 4.7.2.1, probability of flooding in Wells County is approximately one incident of significance approximately every other year based on 16 flood occurrences between 1996 and 2022
<p>Likelihood</p>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> • James River, Pipestem Creek, Rocky Run Creek, Sheyenne River • Closed basins • Rapid change of seasons = excessive snow melt/drainage • High water table southwest/southeast areas of county • Western half and southwest corner of Wells County has sandy soil which contributes to rapid drainage of runoff • Farm and field drain tile and dewatering systems 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> • Likelihood dependent local weather and climate patterns • Upgraded culverts installed from federal funding received during presidential disaster declarations • Western half and southwest corner of Wells County has sandy soil which contributes to rapid drainage of runoff • Farm and field drain tile and dewatering systems
<p>Vulnerability</p>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • Smaller jurisdictions and rural areas with agriculture-based economies are vulnerable to crop and livestock losses from flooding impacts • Multiple severe weather systems occurring close together further inundating existing flooding impacts • Limited local financial resources to accomplish projects independently during Presidential Disaster Declarations 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • The DWR is currently updating all DFIRMS with LiDAR through a FEMA grant. • Advanced warning systems such as IPAWS, cell phones, internet, and TV for flash flooding events • Road raises have been completed and properties have been removed from flood prone areas – ongoing based on current conditions and impacts • Upgraded culverts installed from federal funding received during presidential disaster declarations • Wells County and the city of Fessenden, Harvey, Sykeston enrolled in the NFIP • Harvey Dam and Sykeston Dam provide flood control

Table 4.7.2.4 – Wells County, North Dakota Flood Risk Assessment – Continued

Capability	<u>Administrative and Technical</u>
	<ul style="list-style-type: none"> • FEMA Flood Maps – being updated through a federal grant managed by the N.D. Dept. of Water Resources to include enhanced aerial imagery and the base level engineering data • Active County Commission and City Council(s) • Contracts for engineering, planning, and grant writing • GIS services are provided by county engineering contract • Wells County with GIS capabilities through their engineering contract • Wells County Water Resource District Board • ND Dept. of Water Resources - ND Risk Assessment Mapping (NDRAM) • Administration of Public Assistance (PA) funding through FEMA from Presidential Disaster Declarations • Wells County Road Superintendent
	<u>Education and Outreach</u>
	<ul style="list-style-type: none"> • Active emergency management department with education and outreach capabilities • Social media accounts – Wells County News, Wells County Emergency Management, Sheriff’s Office • Wells County Water Resource District Board provides regulation to land-owners for issues pertaining to water
	<u>Financial</u>
<ul style="list-style-type: none"> • Relies on federal and state entities for assistance with major projects • Public Assistance (PA) funding through FEMA from Presidential Disaster Declarations 	
<u>Planning and Regulatory</u>	
<ul style="list-style-type: none"> • Wells County and the cities of Fessenden, Harvey, and Sykeston adopted NFIP, are enrolled and have flood plain ordinances • Wells County Water Resource District Board • Wells County Planning and Zoning Committee and Administrator • Wells County Floodplain Administrator • Wells County adopted NFIP and has flood plain ordinances • ND Dept. of Water Resources - ND Risk Assessment Mapping (NDRAM) • ND Dept. of Water Resources also has regulations in place for surface water • USDA, Natural Resource Conservation Service (NRCS) • USDA, Farm Services Agency (FSA) 	

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, whether a direct impact to the structure or through secondary affects. The Wells County Road Department shops are located on high points throughout the county and therefore are vulnerable to flooding.

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

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. **The Steering Committee identified lift stations and roads located in low-lying areas are the most vulnerable to flooding**

An inventory of critical facilities and infrastructure is provided in Chapter 3, Profile and Inventory.

Vulnerabilities to New and Future Development

New and future development in Wells County is at high risk of flooding if allowed in a floodplain. With projected local populations stable in Wells County through 2030, the vulnerability to flooding will not change if development is restricted from flood-prone areas.

Flood mapping helps determine which areas are flood-prone and not suitable for development. New and future development in Wells County is more vulnerable to flooding as it does not have flood maps with enough detail to assist the county and cities in planning for future growth accordingly. However, with the completion of the updated FEMA flood maps through the N.D. Dept. of Water Resources, vulnerabilities to new and future development from flooding will be easier to identify.

Data Limitations

The lack of digitized records of public assistance provided to local governments from flood events makes collection and analysis of impacts from the hazard difficult to comprehend during mitigation planning processes.

National Climatic Data Center/National Oceanic and Atmospheric Administration

The hazard history provided in terms of property damage and crop damage (which are only estimates) is calculated based on what the National Weather Service received from insurance companies and individual property owners upon request. Both sources have been reluctant to share that information. Therefore, both practices were discontinued. Because of this, the National Weather Service makes a best guess using all available data at the time of the publication. The damage amounts are received from a variety of sources. Property and crop damage should be considered as a broad estimate.

In addition, the hazard history provided through the National Climatic Data Center/National Oceanic Atmospheric Administration's Storm Events Database contains data from **1950 to 2021**, 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 tornadoes, 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)
- National Flood Insurance Program (and required flood ordinances)
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan, Flood Annex
- North Dakota Dept. of Water Resources Risk Assessment Mapping (NDRAM) Service (flood mapping software)
- 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)
- Wells County Comprehensive Plan (2014)
- Wells County Evacuation Plan through Wells County Emergency Management
- Wells County Local Emergency Operations Plan
- Wells County Mass Care through Wells County Emergency Management
- Wells County Shelter Plan through Wells County Emergency Management
- Wells County Threat and Hazard Identification and Risk Assessment (THIRA)
- Wells County Zoning Ordinance (2014)

4.8 Geologic Hazard

Including abandoned mine lands, earthquakes, environmental minerals (arsenic, erionite, uranium), 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 (Arsenic, Erionite, Uranium):** 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 that moves down-slope.
- **Meteorite Falls:** Meteorite Falls are samples of early solar system materials.
- **Volcanic Hazards:** Geologic impacts from volcanic activity.

Seasonal Pattern	None. Can occur at any time throughout the year. Most prevalent after heavy precipitation events such as severe summer or winter weather.
Duration	Seconds/Minutes/Hours/Days/Weeks/Months/Years
Speed of Onset	Seconds/Minutes/Hours/Days/Weeks/Months/Years
Location	Depends on the extent/magnitude of each specific geologic hazard characteristic but can occur county-wide across all jurisdictions.

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>

4.8 Geologic Hazard – Eddy County, North Dakota

History

The history of geologic hazard is summarized on the following pages. A detailed hazard history for Eddy 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 Eddy County.
- **Earthquake.** No known earthquakes have been recorded in Eddy County.
- **Environmental Minerals (Arsenic, Erionite, Uranium).** There is not a history of environmental minerals (Arsenic, Erionite, Uranium) soils events in Eddy County.
- **Environmental Minerals (Radon).** According to the N.D. Dept. of Environmental Quality, between January 1, 2009, and December 31, 2022, there were approximately 44 positive tests for radon in residential homes in Eddy County.
- **Expansive/Unstable Soils.** No history of expansive/unstable soils events within Eddy County.
- **Landslides.** According to the N.D. Enhanced Mitigation Mission Area Operations Plan (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. Eddy County was included in this disaster declaration. Figure 4.8.2 illustrates areas of the state of North Dakota mapped by the N.D. Geological Survey susceptible to landslides.

According to the N.D. Geological Survey, 21 localized landslide areas are mapped covering 94 acres located in the northern portion of Eddy County, North Dakota.

- **Meteorite Falls.** There is no history of meteorite falls in Eddy County.
- **Volcanic Hazards.** There is no history of volcanic hazards in Eddy County.

Probability

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

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

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

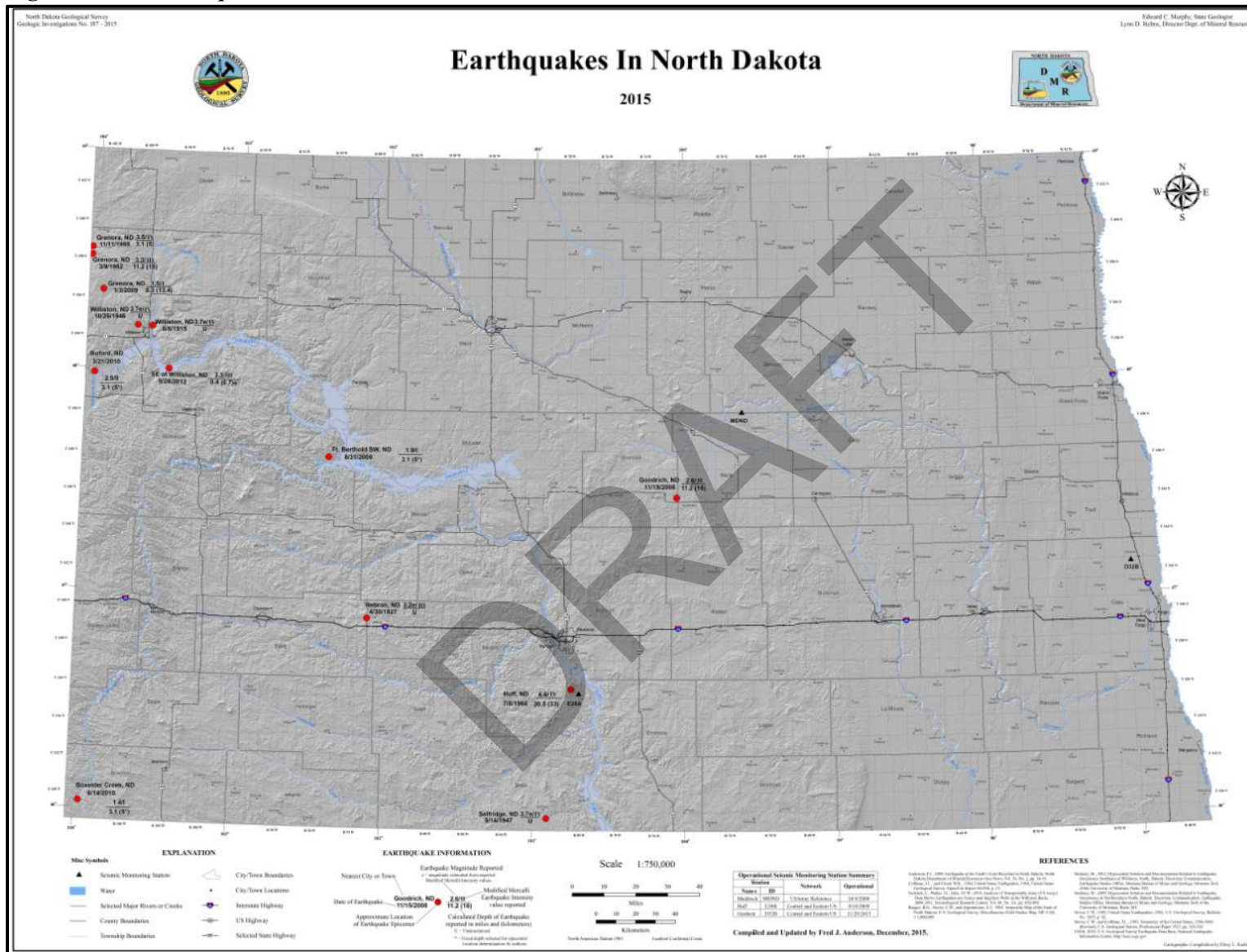
The Steering Committee identified the state's definitions for probability of geologic hazard as applicable to Eddy County. The following probability for geologic hazard in Eddy County is as follows:

- **Abandoned Mine Lands (AMLs).** According to the N.D. Public Service Commission (PSC), there are no Abandoned Mine Lands in Eddy 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 Eddy County. The probability of earthquake in Eddy County is low.
- **Environmental Minerals (Arsenic, Erionite, Uranium).** This type of geologic hazard is localized to its area of geologic origination. They are not expansive or extensive and not found in Eddy 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 Eddy County. Therefore, the probability of this geologic hazard would be low to unknown in Eddy 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 Mission Area Operations Plan (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 in Eddy County is zero.
- **Landslides.** Landslide events are indicative of moisture conditions as they occur more frequent during wet years and are even more probable if the wet years were preceded by dry years. According to the N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP), the probability of future occurrences of landslides is low in Eddy County as no areas of high susceptibility are identified.

According to the N.D. Geological Survey, there is the probability for localized landslides in the Sheyenne River Hydrologic Corridor/Sheyenne River Valley in Eddy County, North Dakota.

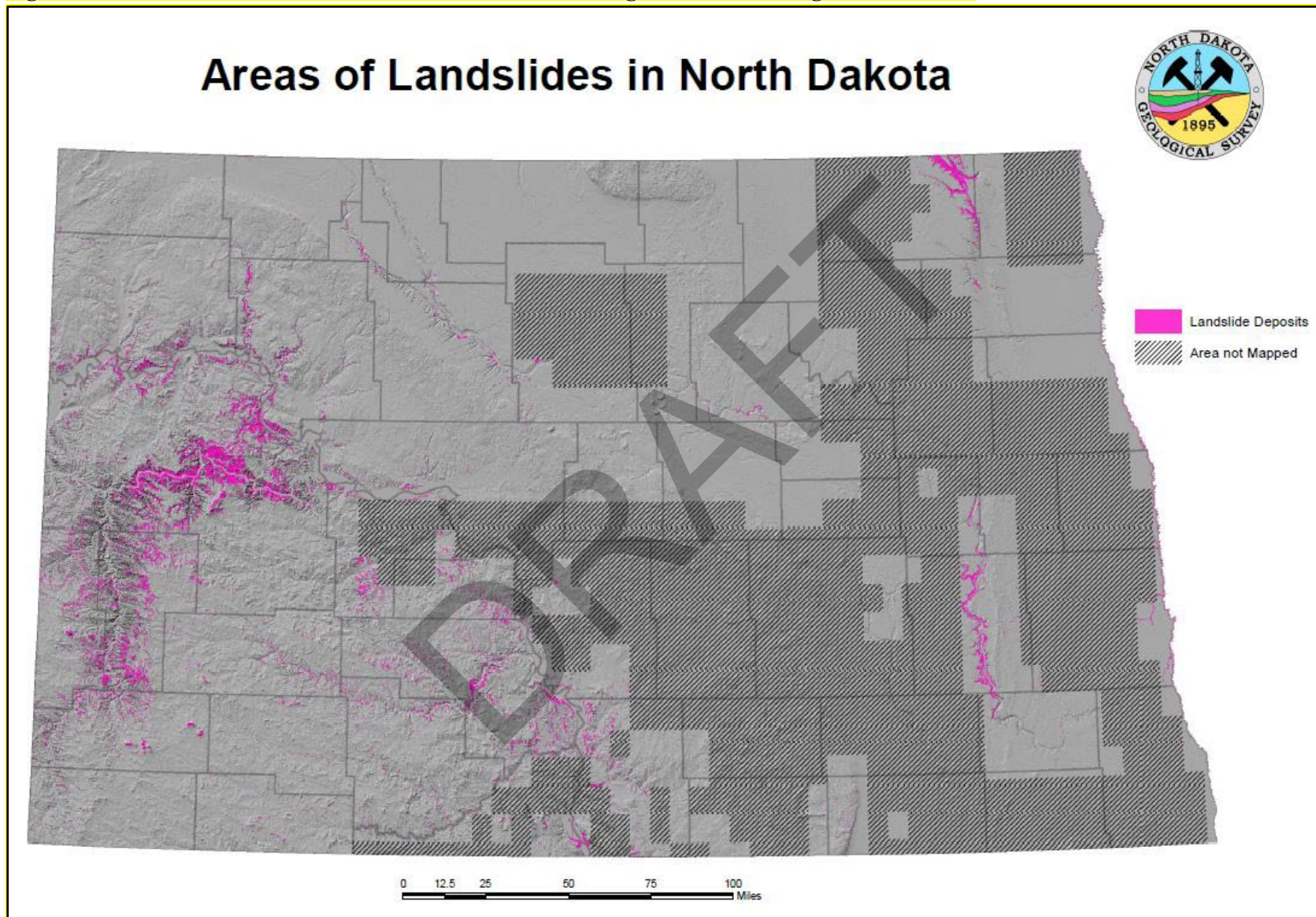
- **Meteorite Falls.** This type of geologic hazard is classified as a remote occurrence and, therefore, the probability is very low.
- **Volcanic Hazards.** This type of geologic hazard is classified as a remote occurrence and, therefore, the probability is very low.

Figure 4.8.1 – Earthquakes in the State of North Dakota as of 2015



Source(s): 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP); N.D. Geological Survey

Figure 4.8.2 – 2022 Areas of Landslides in North Dakota – will get new finalized figure in a month!



Source(s): N.D. Geological Survey

Table 4.8.3 – Eddy County, North Dakota Geologic Hazard Risk Assessment

Impact	<ul style="list-style-type: none"> Blocked Roads & Delayed Emergency Response Business & Government Interruptions Infrastructure Degradation Loss of Power/Electricity Outage Soil Degradation/Erosion 	<ul style="list-style-type: none"> Localized overland flooding resulting from landslides along river valleys Short-term or prolonged loss of service of transportation, communication, or energy infrastructure. Structures could become uninhabitable or unusable.
Frequency	<ul style="list-style-type: none"> 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. Eddy County was included in this disaster declaration. 	<ul style="list-style-type: none"> According to the N.D. Dept. of Environmental Quality, between January 1, 2009, and December 31, 2022, there were approximately 44 positive tests for radon in residential homes in Eddy County.
Likelihood	<p><u>More Likely</u></p> <ul style="list-style-type: none"> All North Dakota counties are in EPA Radon Zone 1 Drought and periods of heavy precipitation exacerbate expansive/unstable soils Presence of Sheyenne River Hydrologic Corridor 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> No AMLs in Eddy County Eddy County lies in the glaciated portion of North Dakota which doesn't produce topographic conditions conducive to landslides
Vulnerability	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> All North Dakota counties are in EPA Radon Zone 1 Drought and periods of heavy precipitation exacerbate expansive/unstable soils Presence of Sheyenne River Hydrologic Corridor 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> Building codes and zoning No AMLs in Eddy County Eddy County in glaciated portion of North Dakota which doesn't have topographic conditions conducive to landslides Eddy County mapped for landslide inventory by the N.D. Geological Survey
Capability	<ul style="list-style-type: none"> 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. 	

Extent/Magnitude

The extent/magnitude of a hazard or threat is expressed in the amount of damage or losses either caused, or that could occur, in a community. 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. There are no AMLs in Eddy County.
- **Earthquake.** A HAZUS Analysis was completed in the N.D. 2018 Enhanced Mitigation Mission Area Operations Plan (MAOP) to estimate losses from a magnitude 5 earthquake. The total economic losses to Eddy County are estimated to be less than \$250,000 type of event. The extent/magnitude of earthquakes in Eddy County would be nominal and instrumental in nature and not felt by residents.
- **Environmental Minerals (Arsenic, Erionite, Uranium).** This type of geologic hazard is localized to its area of geologic origination. They are not expansive or extensive and not found in Eddy County at high concentrations based on available information. Therefore, the extent/magnitude of this geologic hazard would be low or unknown in Eddy 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. There is not a history of this type of geologic event in Eddy County.
- **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. The extent/magnitude of landslides in Eddy County is low.

According to the N.D. Geological Survey, there is the probability for localized landslides in the Sheyenne River Hydrologic Corridor/Sheyenne River Valley in Eddy County, North Dakota. The extent/magnitude consists of subsidence of slopes along the river valley.

- **Meteorite Falls.** The extent/magnitude of a meteorite fall is unknown as it has never occurred in Eddy County.
- **Volcanic Hazards.** There are no volcanoes in Eddy County.

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 – Eddy County, North Dakota Geologic Hazard Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Eddy County	3	2	2	2	2	7
City of New Rockford	3	2	2	2	1	6
City of Sheyenne	3	2	2	2	1	6

(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 Eddy 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

According to the 2018 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 (Arsenic, Erionite, Uranium).** This type of geologic hazard is localized to its area of geologic origination. They are not expansive or extensive and not found in Eddy County at high concentrations based on available information. Therefore, publicly-owned buildings and property in Eddy 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.** Most structures remain unaffected by known impacts from expansive/unstable soils. However, if damage were to occur, the continuity of publicly-owned buildings and property could be disrupted. There are no known publicly-owned buildings or property in Eddy County impacted by 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. There are no known publicly-owned buildings or property in Eddy County impacted by 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 (Arsenic, Erionite, Uranium).** 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 and infrastructure, if damage were to occur, could experience a disruption resulting in either temporary or prolonged shortages or outages. There are no known critical facilities or infrastructure in Eddy County impacted by expansive/unstable soils.
- **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. There are no known critical facilities or infrastructure in Eddy County impacted by landslides.

U.S. Highway 281 and the Red River Valley & Western (RRV&W) Railroad cross the Sheyenne River north of the city of Sheyenne in north-central Eddy County. Due to the Sheyenne River Hydrologic Corridor having landslide risk, the crossings would have localized vulnerability to landslides.

- **Meteorite Falls.** No known vulnerability to critical facilities and infrastructure.
- **Volcanic Hazards.** No known vulnerability to critical facilities and infrastructure.

Table 4.8.3 – Eddy County, North Dakota Geologic Hazard Risk Assessment

Impact	<ul style="list-style-type: none"> Blocked Roads & Delayed Emergency Response Business & Government Interruptions Infrastructure Degradation Loss of Power/Electricity Outage Soil Degradation/Erosion 	<ul style="list-style-type: none"> Localized overland flooding resulting from landslides along river valleys Short-term or prolonged loss of service of transportation, communication, or energy infrastructure. Structures could become uninhabitable or unusable.
Frequency	<ul style="list-style-type: none"> 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. Eddy County was included in this disaster declaration. 	<ul style="list-style-type: none"> According to the N.D. Dept. of Environmental Quality, between January 1, 2009, and December 31, 2022, there were approximately 44 positive tests for radon in residential homes in Eddy County.
Likelihood	<p><u>More Likely</u></p> <ul style="list-style-type: none"> All North Dakota counties are in EPA Radon Zone 1 Drought and periods of heavy precipitation exacerbate expansive/unstable soils Presence of Sheyenne River Hydrologic Corridor 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> No AMLs in Eddy County Eddy County lies in the glaciated portion of North Dakota which doesn't produce topographic conditions conducive to landslides
Vulnerability	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> All North Dakota counties are in EPA Radon Zone 1 Drought and periods of heavy precipitation exacerbate expansive/unstable soils Presence of Sheyenne River Hydrologic Corridor 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> Building codes and zoning No AMLs in Eddy County Eddy County in glaciated portion of North Dakota which doesn't have topographic conditions conducive to landslides Eddy County mapped for landslide inventory by the N.D. Geological Survey
Capability	<ul style="list-style-type: none"> 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. 	

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 Eddy County.
- **Environmental Minerals (Arsenic, Erionite, Uranium).** No vulnerability to new and future development in Eddy County.
- **Environmental Minerals (Radon).** New and future developments will be vulnerable to Radon as all counties in North Dakota are in 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. Proposed development in areas around the Sheyenne River Hydrologic Corridor should be evaluated for landslide risk prior to construction.
- **Meteorite Falls.** No known vulnerability to publicly-owned buildings and property.
- **Volcanic Hazards.** No known vulnerability to publicly-owned buildings and property.

Data Limitations and Other Key Documents

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.

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)
- Eddy County Commercial Animal Feed Operation Ordinance (CAFO)
- Eddy County Comprehensive Plan
- Eddy County Local Emergency Operations Plan
- Eddy 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 County Landslide Inventory Map Series

- 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)

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4.8.2 Geologic Hazard – Wells County, North Dakota

History

The history of geologic hazard is summarized on the following pages. A detailed hazard history for Wells 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 Wells County.
- **Earthquake.** An instrumentally-verified Magnitude 2.6 earthquake occurred on the border between Sheridan and Wells Counties on November 15, 2008. Figure 4.8.1 illustrates the locations of earthquakes in North Dakota as of 2015.
- **Environmental Minerals (Arsenic, Erionite, Uranium).** There is not a history of environmental minerals (Arsenic, Erionite, Uranium) soils events in Wells County.
- **Environmental Minerals (Radon).** According to the N.D. Dept. of Environmental Quality, between January 1, 2007, and December 31, 2022, there were approximately 327 positive tests for radon in residential homes in Wells County.
- **Expansive/Unstable Soils.** No history of expansive/unstable soils events within Wells County.
- **Landslides.** According to the N.D. Enhanced Mitigation Mission Area Operations Plan (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. Wells County was included in this disaster declaration. Figure 4.8.2 illustrates areas of the state of North Dakota mapped by the N.D. Geological Survey susceptible to landslides.
- **Meteorite Falls.** There is no history of meteorite falls in Wells County.
- **Volcanic Hazards.** There is no history of volcanic hazards in Wells County.

Probability

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

Common Occurrence	Abandoned Mine Lands (AMLs), Expansive/Unstable Soils, Environmental Minerals (Radon) and Landslides
Limited Occurrence	Environmental Minerals (Arsenic, Erionite, Uranium), Earthquake
Remote Occurrence	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 Wells County. The following probability for geologic hazard in Wells County is as follows:

- **Abandoned Mine Lands (AMLs).** According to the N.D. Public Service Commission (PSC), there are no Abandoned Mine Lands in Wells 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 Wells County. The probability of earthquake in Wells County is low.

The probability of another seismic event in Wells County like the earthquake in 2008 would be very low.

- **Environmental Minerals (Arsenic, Erionite, Uranium).** This type of geologic hazard is localized to its area of geologic origination. They are not expansive or extensive and not found in Wells 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 Wells County. Therefore, the probability of this geologic hazard would be low to unknown in Wells 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 Mission Area Operations Plan (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 in Wells County is zero.
- **Landslides.** Landslide events are indicative of moisture conditions as they occur more frequent during wet years and are even more probable if the wet years were preceded by dry years. According to the N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP), the probability of future occurrences of landslides is low in Wells County as no areas of high susceptibility are identified.

According to the N.D. Geological Survey, there is the probability for localized landslides in the James River and Sheyenne River Hydrologic Corridors, and the Pipestem Creek in Wells County.

- **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 of damage or losses either caused or could occur in a community. 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 and small in geographic expanse to extensive damage if impacting structures or infrastructure. There are no AMLs in Wells County.
- **Earthquake.** A HAZUS Analysis was completed in the N.D. 2018 Enhanced Mitigation Mission Area Operations Plan (MAOP) to estimate losses from a magnitude 5 earthquake. The total economic losses to Wells County are estimated to be less than \$250,000 type of event. The extent/magnitude of earthquakes in Wells County would be nominal and instrumental in nature and not felt by residents.
- **Environmental Minerals (Arsenic, Erionite, Uranium).** This type of geologic hazard is localized to its area of geologic origination. They are not expansive or extensive and not found in Wells County at high concentrations based on available information. Therefore, the extent/magnitude of this geologic hazard would be low or unknown in Wells 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. There is not a history of this type of geologic event in Wells County. Therefore, the extent/magnitude of expansive/unstable soils is very low in Wells County.
- **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. The extent/magnitude of landslides in Wells County is low. No critical facilities in Wells County are in areas susceptible to landslides.

According to Wells County Emergency Management, an abandoned BNSF railroad earthen structure west of the city of Bowdon is vulnerable to localized landslides due to impacts from flooding.

- **Meteorite Falls.** The extent/magnitude of a meteorite fall is unknown as it has never occurred in Wells County.
- **Volcanic Hazards.** There are no volcanoes in Wells County.

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 – Wells County, North Dakota Geologic Hazards Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Wells County	4	3	2	3	2	8
City of Bowdon	3	2	2	2	1	8
City of Cathay	3	2	2	2	1	8
City of Fessenden	3	2	2	2	1	8
City of Harvey	4	2	2	4	1	11
City of Hamberg	3	2	2	2	1	8
City of Hurdsfield	3	2	2	2	1	8
City of Sykeston	3	2	2	3	1	8

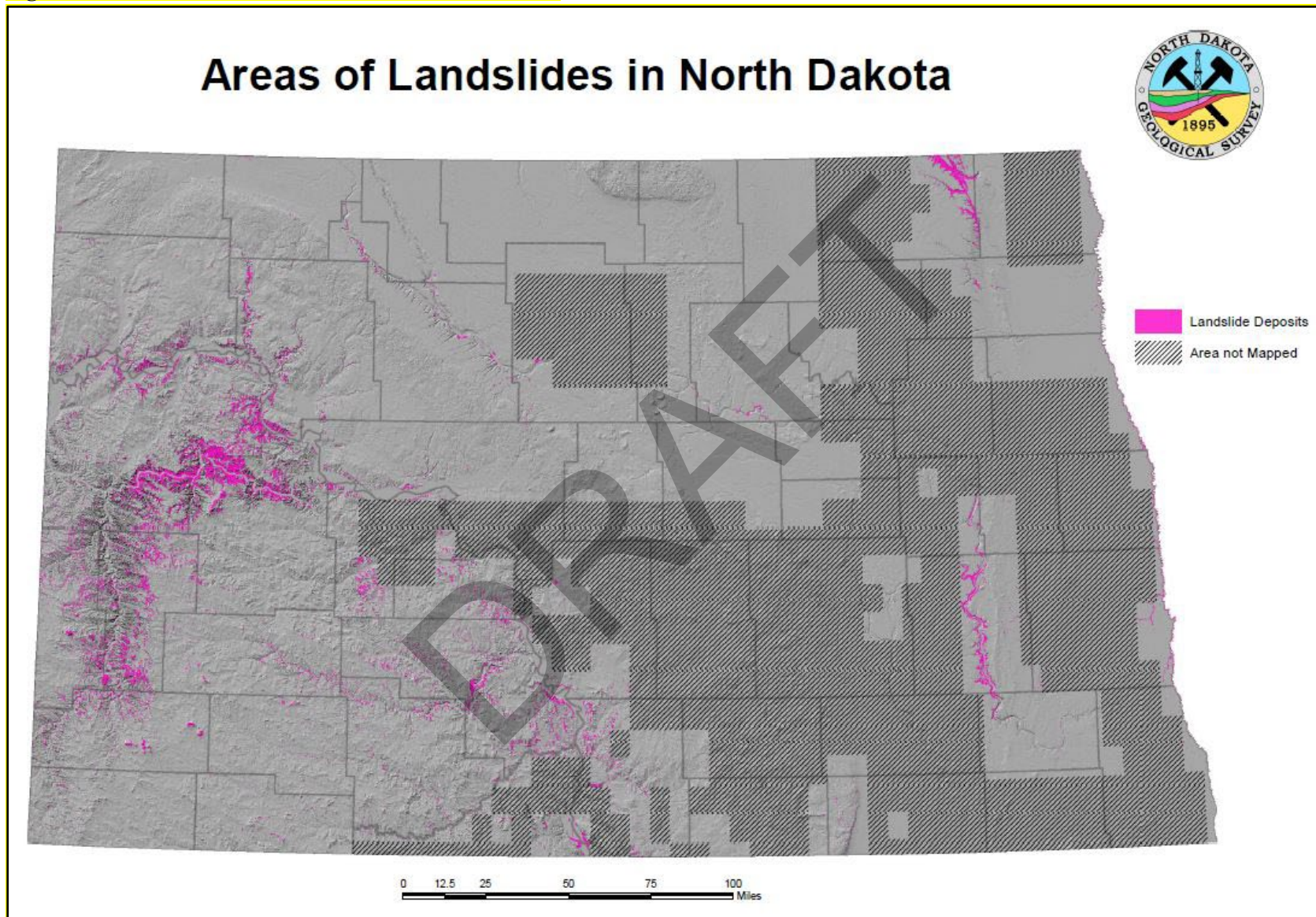
(Formula: Impact + Frequency + Likelihood + Vulnerability – Capabilities = Total)

Tables 4.8.3 provides information on the specific impact, frequency, likelihood, vulnerability, and capability of geologic hazard in Wells 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 – Wells County, North Dakota Geologic Hazard Risk Assessment

Impact	<ul style="list-style-type: none"> Blocked Roads & Delayed Emergency Response Business & Government Interruptions Infrastructure Degradation Loss of Power/Electricity Outage Soil Degradation/Erosion 	<ul style="list-style-type: none"> Localized overland flooding resulting from landslides along river valleys Short-term or prolonged loss of service of transportation, communication, or energy infrastructure. Structures could become uninhabitable or unusable.
Frequency	<ul style="list-style-type: none"> 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. Wells County was included in this disaster declaration. A magnitude 2.6 earthquake occurred on the border between Sheridan and Wells Counties on November 15, 2008. Figure 4.8.1 illustrates the locations of earthquakes in North Dakota as of 2015. 	<ul style="list-style-type: none"> According to the N.D. Dept. of Environmental Quality, between January 1, 2009, and December 31, 2022, there were approximately 327 positive tests for radon in residential homes in Wells County. Abandoned CP railroad earthen structure west of the city of Bowdon is vulnerable to localized landslides due to impacts from flooding.
Likelihood	<p><u>More Likely</u></p> <ul style="list-style-type: none"> All North Dakota counties are in EPA Radon Zone 1 Drought and periods of heavy precipitation exacerbate expansive/unstable soils Presence of James and Sheyenne River Hydrologic Corridors and Pipestem Creek 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> No AMLs in Wells County Wells County lies in the glaciated portion of North Dakota which doesn't produce topographic conditions conducive to landslides
Vulnerability	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> All North Dakota counties are in EPA Radon Zone 1 Drought and periods of heavy precipitation exacerbate expansive/unstable soils Presence of James and Sheyenne River Hydrologic Corridors and Pipestem Creek 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> Building codes and zoning No AMLs in Wells County Wells County in glaciated portion of North Dakota which doesn't have topographic conditions conducive to landslides Wells County mapped for landslide inventory by the N.D. Geological Survey
Capability	<ul style="list-style-type: none"> 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. 	

Figure 4.8.2 – 2022 Areas of Landslides in North Dakota



Source(s): N.D. Geological Survey

Vulnerabilities to Publicly-Owned Buildings and Property

According to the 2018 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 (Arsenic, Erionite, Uranium).** This type of geologic hazard is localized to its area of geologic origination. They are not expansive or extensive and not found in Wells County at high concentrations based on available information. Therefore, publicly-owned buildings and property in Wells 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.** Most structures remain unaffected by known impacts from expansive/unstable soils. However, if damage were to occur, the continuity of publicly-owned buildings and property could be disrupted. There are no known publicly-owned buildings or property in Wells County impacted by 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. There are no known publicly-owned buildings or property in Wells County impacted by 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 (Arsenic, Erionite, Uranium).** 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 remain unaffected by known impacts from expansive/unstable soils. 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. There are no known critical facilities or infrastructure in Wells County impacted by expansive/unstable soils.
- **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. There are no known critical facilities or infrastructure in Wells County impacted by landslides.

The Harvey Dam in the city of Harvey is at risk to landslide from flooding, which could have a catastrophic impact on the Canadian Pacific (CP) railroad earthen pass.

- **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 Wells County.
- **Environmental Minerals (Arsenic, Erionite, Uranium).** No vulnerability to new and future development in Wells County.
- **Environmental Minerals (Radon).** New and future developments will be vulnerable to Radon as all counties in North Dakota are in 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. Proposed development in areas

around the James and Sheyenne River Hydrologic Corridors and the Pipestem Creek should be evaluated for landslide risk prior to construction.

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

Data Limitations and Other Key Documents

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.

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)
- North Dakota Continuity of Operations Plan
- North Dakota Emergency Operations Plan, Geologic Hazard Annex
- North Dakota Geological Survey County Landslide Inventory Map Series
- 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)
- Wells County Commercial Animal Feed Operation Ordinance (CAFO)
- Wells County Comprehensive Plan
- Wells County Local Emergency Operations Plan (LEOP)
- Wells County 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 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).

Seasonal Pattern	None. Anhydrous Ammonia is more likely in the spring and fall.
Duration	Minutes/hours/days/weeks
Speed of Onset	No warning
Location	<p>Along major transportation routes – U.S. Highways 52 and 281. Tier II and agricultural and/or industrial storage sites, and roads: N.D. Highways 3, 9, 150, 20, 30, and 200.</p> <p>BNSF Railroad, CP Railway, and RRV&W Railroad.</p> <p>No transportation of chemicals via airplane to the Planning Area, but are applied to fields/crops in the county via crop sprayers/small airplanes.</p> <p>Three energy pipelines traverse the Planning Area.</p>

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>

4.9.1 Hazardous Material Release – Eddy County, North Dakota

History

Information on the history of hazardous material release in Eddy County was provided by the N.D. Dept. of Health and Eddy County Emergency Management. Table 4.9.1.1 summarizes the history of hazardous material release in Eddy County from the N.D. Dept. of Health. A detailed hazard history for Eddy County can be found on a disc located at the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment.

N.D. Dept. of Health

- Per table 4.9.1.1, a total of three releases/spills were reported in Eddy County from March 2004 to August 2022. A total of 2,068.33 gallons of hazardous materials were spilled.

Table 4.9.1.1 – March 2004 to August 2022 Eddy County, North Dakota Hazardous Material Release History

Incident Date	Latitude	Longitude	Contaminant	Volume	Units	Contained
3/30/2004	47.68009	-99.11496	Unleaded Gasoline	6,000.00	gallons	--
8/13/2008	47.5946	-98.91547	Crude Oil	200.00	gallons	--
8/8/2022	47.71445	-99.18976	Diesel	5.00	gallons	Yes
TOTAL				6,205.00		
AVERAGE				2,068.33		

Source(s): N.D. Dept. of Health & Human Services

Eddy County Emergency Management

- No major incidents have been reported.

Probability

The probability of a hazard or threat is how likely it is it will happen. Per Table 4.9.1.1, the probability of a hazardous material release is one incident every two and-a-half to four years based on nine occurrences from March 2004 to August 2022. Meeting participants also indicated the probability of a hazardous material release meaning that there is between a 10 and 100 percent probability in the next year of an occurrence. The following are key points regarding hazardous material release probability in Eddy County:

- Airports.** Hazardous materials are not transported via plane to and from Eddy County using the New Rockford Municipal Airport private landing strips. However, crop sprayers use the New Rockford Municipal Airport for commercial applications.
- 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 report the chemical quantities that equal or exceed either five hundred pounds or the threshold planning quantity 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. **According to the N.D. Dept. of Emergency Services, HAZ Connect, Eddy County has 14 Tier II facilities.**

All anhydrous ammonia facility locations in Eddy County have been decommissioned.

Pipelines. According to the 2018 N.D. Enhanced Mitigation MAOP, there are 24.86 miles of gas transmission pipeline and 25.72 miles of hazardous liquid pipeline traversing Eddy County comprising 0.70 percent of all gas and hazardous liquid transmission lines in the state of North Dakota.

Figures 4.9.1.1 and 4.9.1.2 illustrate the locations of crude oil pipelines and natural gas pipelines in the state of North Dakota.

- **Rail.** According to the 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP), Eddy County has had a decrease in the number of rail cars carrying crude oil, from a peak of 172 in 2015 to 18 in 2018.
- **Road.** It is unknown if the reported incidents in Table 4.9.1.1 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 Eddy County Emergency Management and meeting participants, releases/spills do occur from road transportation incidents. Large quantities of hazardous materials are transported via U.S. Highways 281.

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.

- **Airports.** Hazardous materials are not transported via plane to and from Eddy County using the New Rockford Municipal Airport private landing strips. However, crop sprayers use the New Rockford Municipal Airport for commercial applications.

Crop sprayers utilizing airplanes for application, and private airplane owners, can result in local releases into the environment.

- **Fixed Facilities (Tier II and Extremely Hazardous Substance).**

Per Table 4.9.1.1, the largest reported spill/release was 6,000.00 gallons of unleaded gasoline transformer oil on March 30, 2004. 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.

- **Pipelines.** According to the 2018 N.D. Enhanced Mitigation MAOP, there are 3.96 miles of gas transmission pipeline traversing Eddy County comprising 0.05 percent of all gas and hazardous liquid transmission lines in the state of North Dakota. **No noticeable extent/magnitude of a hazardous material release produced by a pipeline rupture or explosion in Eddy County.**
- **Rail.** The extent/magnitude of a hazardous material release in Eddy County can range in size from the 2015 derailment in unincorporated Heimdal in neighboring Wells County.
- **Road.** It is unknown if the reports incidents in Table 5.5.1 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 the release/spill.

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.

Risk Assessment

Table 4.9.1.2 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 4.9.1.2 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.

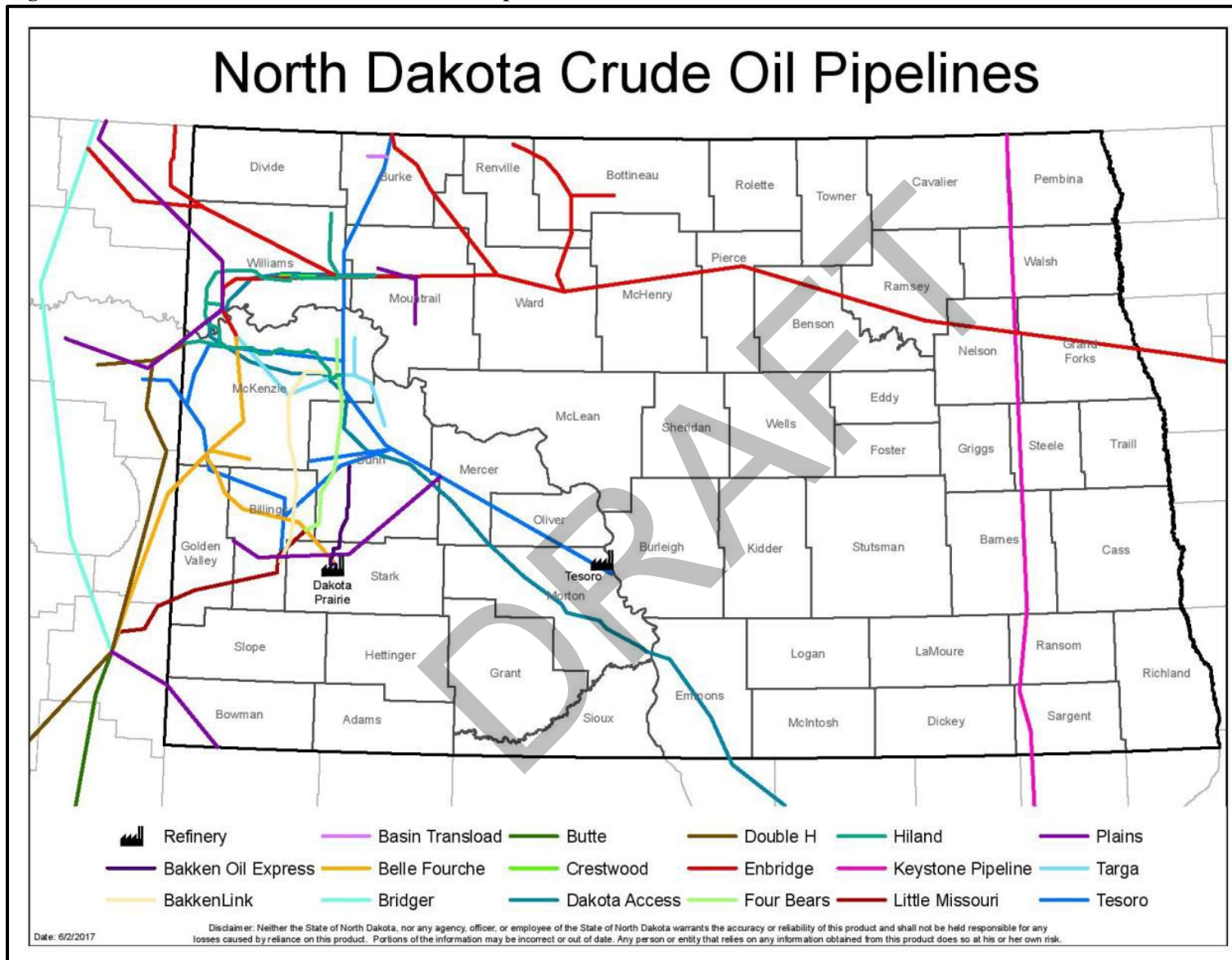
Table 4.9.1.2 – Eddy County, North Dakota Hazardous Material Release Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Eddy County	3	3	3	2	1	10
City of New Rockford	3	3	3	2	1	10
City of Sheyenne	2	2	3	2	1	8

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

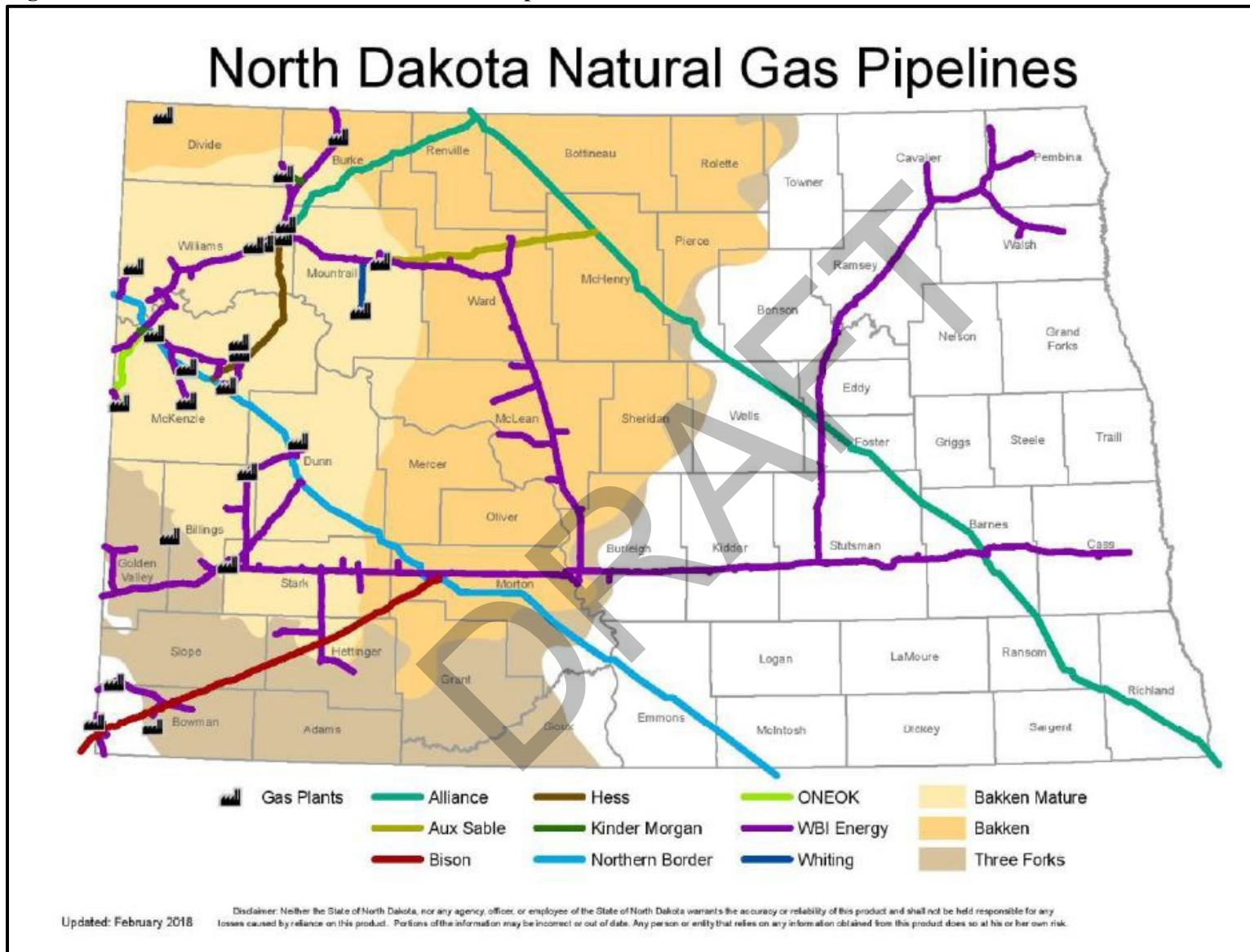
Table 4.9.1.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of hazardous material release in Eddy County. A list of impacts identified as commonplace for natural hazards and man-made threats regardless of the jurisdiction is shown in Chapter 4, Threat and Hazard Identification Risk Assessment (THIRA).

Figure 4.9.1.1 – 2018 North Dakota Crude Oil Pipelines



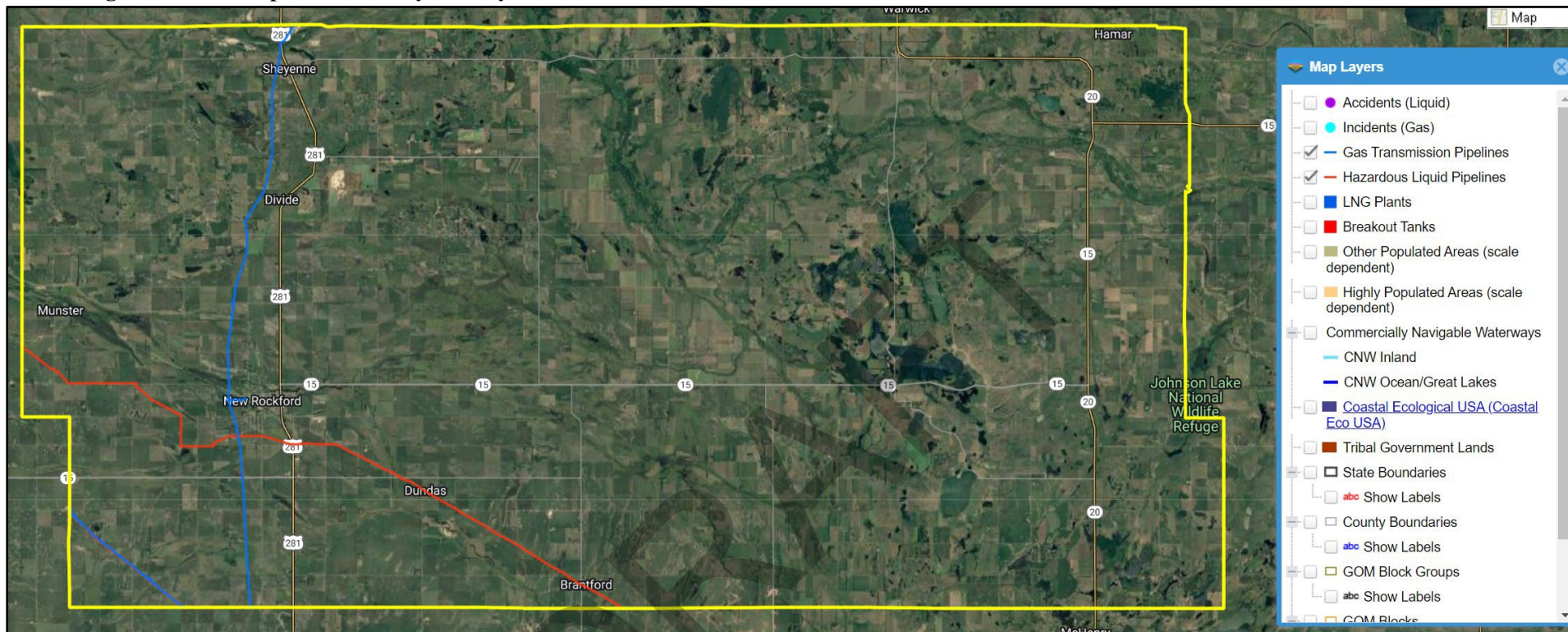
Source(s): 2018 N.D. Enhanced Mitigation MAOP

Figure 4.9.1.2 – 2018 North Dakota Natural Gas Pipelines



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

Figure 4.9.1.3 – Pipelines in Eddy County, North Dakota



Source(s): National Pipeline Mapping System

Table 4.9.1.3 – Eddy County, North Dakota Hazardous Material Release Risk Assessment

Impact	<ul style="list-style-type: none"> • Business Interruptions/Loss of Economy • Explosion • Environmental Degradation • Fuel Outage/Shortage • Human/Injury Death • Increased Public Safety Runs 	<ul style="list-style-type: none"> • Loss of Critical Facilities and Infrastructure • Loss/Overcrowded Medical Facilities • Loss of Transportation Systems/Accessibility - Blocking of roads when emergency services respond to incidents • Leaking fuel tanks contaminate local waterways and potable water supplies (individual wells)
Frequency	<ul style="list-style-type: none"> • Three releases/spills were reported in Eddy County from March 2004 to August 2022 • Per Table 4.9.1.1, the largest reported spill/release was 6,000.00 gallons of unleaded gasoline on March 30, 2004. 	
Likelihood	<p><u>More Likely</u></p> <ul style="list-style-type: none"> • Presence of N.D. Highways 15, 20, and U.S. Highway 281 • Agriculture economy with heavy use of chemicals • Crop sprayers and private plane operators • Eddy County has 14 Tier II Sites • Large storage containers in city limits (propane, gasoline, diesel) • Propane tanks are main heating source throughout rural areas • Two natural gas pipelines traversing Eddy County 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> • Tier II reporting and regulations (fixed facilities only) • BNSF and RRV&W Railroad infrastructure • No major interstate • No major commercial passenger airport • Ordinances regulating development/placement of HAZMAT • Anhydrous ammonia sites decommissioned in the county • Fire departments have HAZMAT training
Vulnerability	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • Presence of N.D. Highways 15, 20, and U.S. Highway 281 • Agriculture economy with heavy use of chemicals • Crop sprayers and private plane operators • Eddy County has 14 Tier II Sites • Large storage containers in city limits (propane, gasoline, anhydrous) • Propane tanks are main heating source throughout county • Anhydrous plants and major chemical suppliers in the county • Two natural gas pipelines traversing Eddy County 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • Tier II reporting and regulations (fixed facilities only) • BNSF and RRV&W Railroad infrastructure • No major interstate • No major commercial passenger airport • Ordinances regulating development/placement of HAZMAT • Fire departments have HAZMAT training • Anhydrous ammonia sites decommissioned throughout county • Winter months sees decrease in agriculture-related chemicals • NDDDES HAZConnect
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address hazardous material release. 	

Vulnerabilities to Publicly-Owned Buildings and Property

All publicly-owned buildings and property are at risk of 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 New Rockford, the Eddy County Courthouse, Lutheran Home of the Good Shepherd, and New Rockford-Sheyenne Public School may be vulnerable to a hazardous material release from a fixed site or transportation of hazardous materials through city limits.

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/threat to critical facilities and infrastructure depends 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 the Eddy County Courthouse, Lutheran Home of the Good Shepherd, and New Rockford-Sheyenne Public School 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.

The water tower in the city of New Rockford is adjacent to RRV&W Railroad, and 500 feet away from BNSF Railroad.

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

Vulnerabilities to New and Future Development

The vulnerability of new and future development depends 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.

New development located near or adjacent to recreation areas in the extreme southwest corner of Eddy County will be vulnerable to hazardous material releases from an existing natural gas pipeline and potential future development in the area. The county should update zoning ordinances to implement setbacks from hazardous material sites or infrastructure for new development from this infrastructure.

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. Hazardous materials should be prohibited from being 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/or care centers.**

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 incident, 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)
- Eddy County Comprehensive Plan (2014)
- Eddy County Commercial Animal Feed Operation Ordinance
- Eddy County Evacuation Plan through Eddy County Emergency Management
- Eddy County Local Emergency Operations Plan (LEOP)
- Eddy County Mass Care Plan through Lake Region District Health Unit
- Eddy County Shelter Plan through Eddy County Emergency Management
- Eddy 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)

4.9.2 Hazardous Material Release – Wells County, North Dakota

History

Information on the history of hazardous material release in Wells County was provided by the N.D. Dept. of Health and Wells County Emergency Management. Table 4.9.2.1 summarizes the history of hazardous material release in Wells County from the N.D. Dept. of Health. A detailed hazard history for Wells County can be found on a disc located at the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment.

N.D. Dept. of Health

- Per table 4.9.2.1, a total of 30 releases/spills were reported in Wells County from July 1982 to March 2020. A total of 98,044.00 gallons of hazardous materials were spilled.

Table 4.9.2.1 – July 1982 to March 2020 Wells County, North Dakota Hazardous Material Release

Incident Date	Latitude	Longitude	Contaminant	Volume	Units	Contained
7/31/1982	47.84038	-99.95141	Diesel Fuel	3,000.00	gallons	--
10/1/1985	47.76771	-99.93009	Fuel Oil	--	--	--
5/13/1993	47.45041	-99.93704	Diesel Fuel	3,000.00	gallons	--
11/8/1993	47.78228	-99.97279	Transformer Oil	600.00	gallons	--
1/7/2001	47.76771	-99.93009	Diesel - Overfill. Onto snow and Ice.	40.00	gallons	--
3/18/2001	47.76771	-99.93009	"Not more than 20 gal diesel" spilled in fueling overflow, by local jobber.	20.00	gallons	--
5/23/2001	47.76781	-99.95138	Diesel fuel	40.00	gallons	--
9/30/2002	47.75327	-99.93024	Diesel Fuel	150.00	gallons	--
1/5/2005	47.76771	-99.93009	Railroad diesel fuel	25.00	gallons	--
4/18/2005	47.76771	-99.93009	Transformer oil	14.00	gallons	--
6/8/2005	47.76771	-99.93009	#2 Diesel Fuel	30.00	gallons	--
5/7/2006	47.40692	-99.91557	UAN (urea/ammonium nitrate) 28% nitrogen solution	9,500.00	gallons	--
4/15/2008	47.76771	-99.93009	anhydrous ammonia	5.00	gallons	--
3/18/2010	47.76771	-99.93009	antifreeze/ethylene glycol	10.00	gallons	--
4/28/2010	47.4432	-99.95554	Urea fertilizer	10,000.00	pounds	--
8/16/2010	47.78228	-99.97279	diesel spill	100.00	gallons	--
6/13/2011	47.45045	-100.00104	Liquid Nitrogen Fertilizer - 28%	10,000.00	gallons	--
8/2/2012	47.62452	-99.91597	#2 Dyed Diesel	700.00	gallons	--
12/20/2013	47.77409	-99.93949	presumably heating oil/diesel fuel/kerosene/gasoline	--	--	--
2/7/2014	47.77098	-99.93208	bulk petroleum	--	--	--
4/1/2015	47.77521	-99.94304	petroleum and potentially some fill w/coal clinkers	--	--	Yes
5/6/2015	47.79252	-99.64014	Crude Oil	60,000.00	gallons	Yes
9/6/2015	47.78903	-99.98252	Diesel Fuel	500.00	gallons	Yes
2/22/2016	47.76983	-99.93019	Diesel spill	100.00	gallons	Yes
9/7/2016	47.45802	-99.41476	Transformer oil	--	--	Yes
9/27/2016	47.77719	-99.94553	Sonalan HFP herbicide	10.00	gallons	Yes
4/3/2017	47.64978	-99.63078	Laboratory data = DRO in shallow groundwater exceeds NDDH guidelines (2,200 ug/L)	--	--	Yes
4/4/2017	47.7755	-99.93996	Diesel Fuel	--	--	Yes
9/28/2018	47.55536	-99.40862	Gasoline and Diesel Fuel	-	gallons	Yes
3/24/2020	47.76992	-99.92752	Diesel Fuel	200.00	gallons	Yes
TOTAL				98,044.00		
AVERAGE				4,262.78		

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

Wells County Emergency Management

May 6, 2015. A BNSF train carrying 107 crude oil cars and two buffer cars loaded with sand derailed near unincorporated Heimdal. In total, six cars derailed and exploded into flames. The city was evacuated. No injuries or fatalities, or property damage, was reported. Figures 4.9.2.1 and 4.9.2.2 illustrate the extent of the derailment.

Figure 4.9.2.1 May 6, 2015, Unincorporated Heimdal BNSF Train Derailment



Source(s): Wells County Emergency Management, KFYZ-TV

Figure 4.9.2.2 May 6, 2015, Unincorporated Heimdal BNSF Train Derailment



Source(s): Wells County Emergency Management, KFYZ-TV

Probability

The probability of a hazard or threat is how likely it is it will happen. Per Table 4.9.2.1, the probability of a hazardous material release is one incident every two and-a-half to four years based on 30 occurrences from July 1982 to March 2020. Meeting participants also indicated the probability of a hazardous material release meaning that there is between a 10 and 100 percent probability in the next year of an occurrence. The following are key points about the probability of a hazardous material release in Wells County:

- **Airports.** Hazardous materials are transported via plane to and from Wells County using the Fessenden-Streibel Municipal Airport, Harvey Municipal Airport, and private landing strips. There are no reported incidents of a plane crash carrying hazardous materials in Wells 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 report the chemical quantities that equal or exceed either five hundred pounds or the threshold planning quantity 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. **According to the N.D. Dept. of Emergency Services, HAZ Connect, Wells County has 27 Tier II facilities.**

According to the 2018 N.D. Enhanced Mitigation MAOP, there are five anhydrous ammonia facility locations in Wells County.

Pipelines. According to the 2018 N.D. Enhanced Mitigation MAOP, there are 26.86 miles of gas transmission pipeline and 54.73 miles of hazardous liquid pipeline traversing Wells County comprising 1.13 percent of all gas and hazardous liquid transmission lines in the state of North Dakota.

Figures 4.9.2.1 and 4.9.2.2 illustrate the locations of crude oil pipelines and natural gas pipelines in the state of North Dakota.

Per the 2015 Wells County Hazardous Materials Flow Study, the Alliance Pipeline transports a total of 1.6 billion cubic feet of natural gas each day through Wells County, equivalent to the heating needs of seven million homes. The pipeline is remotely monitored and operated by a gas control center 24 hours a day, 365 days a year. Any portion of the pipeline can be isolated if leaks or other problems are detected. The Cenex Pipeline transports gasoline and diesel. The 2014 annual throughput in Wells County was 2,104,363 barrels. The pipeline is operated via a Supervisory Control and Data Acquisition (SCADA) system equipped with leak detection monitoring and is monitored 24/hour a day. The Kinder Morgan Chochin Pipeline transports Liquefied Petroleum Gas. Information on the volume of the hazardous materials transported through these pipelines was not available. Figure 5.5.2.1 illustrates the pipelines traversing Wells County.

- **Rail.** The Burlington Northern Santa Fe Railroad (BNSF) and Canadian Pacific Railway (CP Rail) support freight needs in Wells County. The Red River Valley and Western (RRV&W) did support freight needs in Wells County but has been abandoned in its entirety since 2004.

An average of 0.66 train cars carrying hazardous materials are transported daily through Wells County by Canadian Pacific Railway between January 1, 2014, and December 31, 2014. The most common hazardous material shipped through Wells County by CP Railway is UN1993 (Diesel/Fuel Oil/Flammable Liquid) accounting for 9.8 percent of all shipments of hazardous materials for the calendar year.

- According to the 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP), Wells County has had a decrease in the number of rail cars carrying crude oil, from a peak of 172 in 2015 to 18 in 2018.
- **Road.** It is unknown if the reported incidents in Table 4.9.2.1 were the result of a transportation incident or a leak from a storage site. The N.D. Dept. of Health provided the data but did not specify the cause of the release/spill. However, according to Wells County Emergency Management and the Plan Update Committee, releases/spills do occur from road transportation incidents.

Per the 2015 Wells County Hazardous Materials Flow Study, the most common hazardous material type being transported through Wells County on U.S. Highway 52 is UN 1203 (Gasoline), accounting for 33 percent of all observed vehicles transporting hazardous materials. The second most common hazardous material commodity transported through Wells County is UN Number 1075 (liquefied petroleum gas) comprising 17 percent of all observed vehicles, followed by UN Number 1993 (diesel/fuel oil/flammable liquid) comprising 13 percent of all observed vehicles.

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.

- **Airports.** Hazardous materials are not transported via plane to and from Wells County using the Fessenden-Streibel Municipal Airport, Harvey Municipal Airport, and private landing strips. There extent/magnitude of a hazardous material release from a plane crash carrying in Wells County is unknown.

Crop sprayers utilizing airplanes for application, and private airplane owners, can result in local releases into the environment.

- **Fixed Facilities (Tier II and Extremely Hazardous Substance).**

Per Table 4.9.2.1, the largest reported spill/release was 60,000.00 gallons of crude oil transformer on May 6, 2015, which was the train derailment in unincorporated Heimdal. 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.

- **Pipelines.** A hazardous material release produced by a pipeline rupture or explosion in Wells County could result in an incident with an extent/magnitude like the train derailment in unincorporated Heimdal. Communities could be evacuated due to explosions, injuries or fatalities could occur, and property could be damaged.
- **Rail.** The derailment of the BNSF train carrying 107 crude oil cars and two buffer cars loaded with sand derailed near unincorporated Heimdal. In total, six cars derailed and exploded into flames. The city was evacuated. No injuries or fatalities, or property damage, was reported.
- **Road.** It is unknown if the reports incidents in Table 5.5.1 were the result of a transportation incident or a leak from a storage site. The N.D. Dept. of Health provided the data but did not specify the cause of the release/spill. A hazardous material release from involving a road could result in an explosion, possible injuries or fatalities, and disruptions to the local transportation system.

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.

Risk Assessment

Table 4.9.2.2 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 4.9.2.2 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 4.9.2.2 – Wells County, North Dakota Hazardous Material Release Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Wells County	4	2	4	4	1	13
City of Bowdon	2	2	2	2	1	7
City of Cathay	2	2	2	3	1	8
City of Fessenden	4	2	3	4	1	12
City of Hamberg	2	2	2	3	1	8
City of Harvey	4	3	3	4	1	13
City of Hurdsfield	2	2	2	2	1	7
City of Sykeston	2	2	2	2	1	7

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

Table 4.9.2.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of hazardous material release in Wells 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 are at risk of hazardous material release as this type of hazard 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 typically occurs during transportation of hazardous materials. **The Wells County Courthouse and the Fessenden Fire Department in the city of Fessenden, Harvey Ambulance, Harvey City Hall, Harvey Fire Hall, are located across the street from the CP Railway. The elementary school in Harvey is located 1.5 blocks south and the high school is two blocks north of CP Railway. The Fessenden-Bowdon Public School is 2.5 blocks from CP Railway. The daycare and building in the city of Harvey is publicly owned and is vulnerable to the threat.**

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.

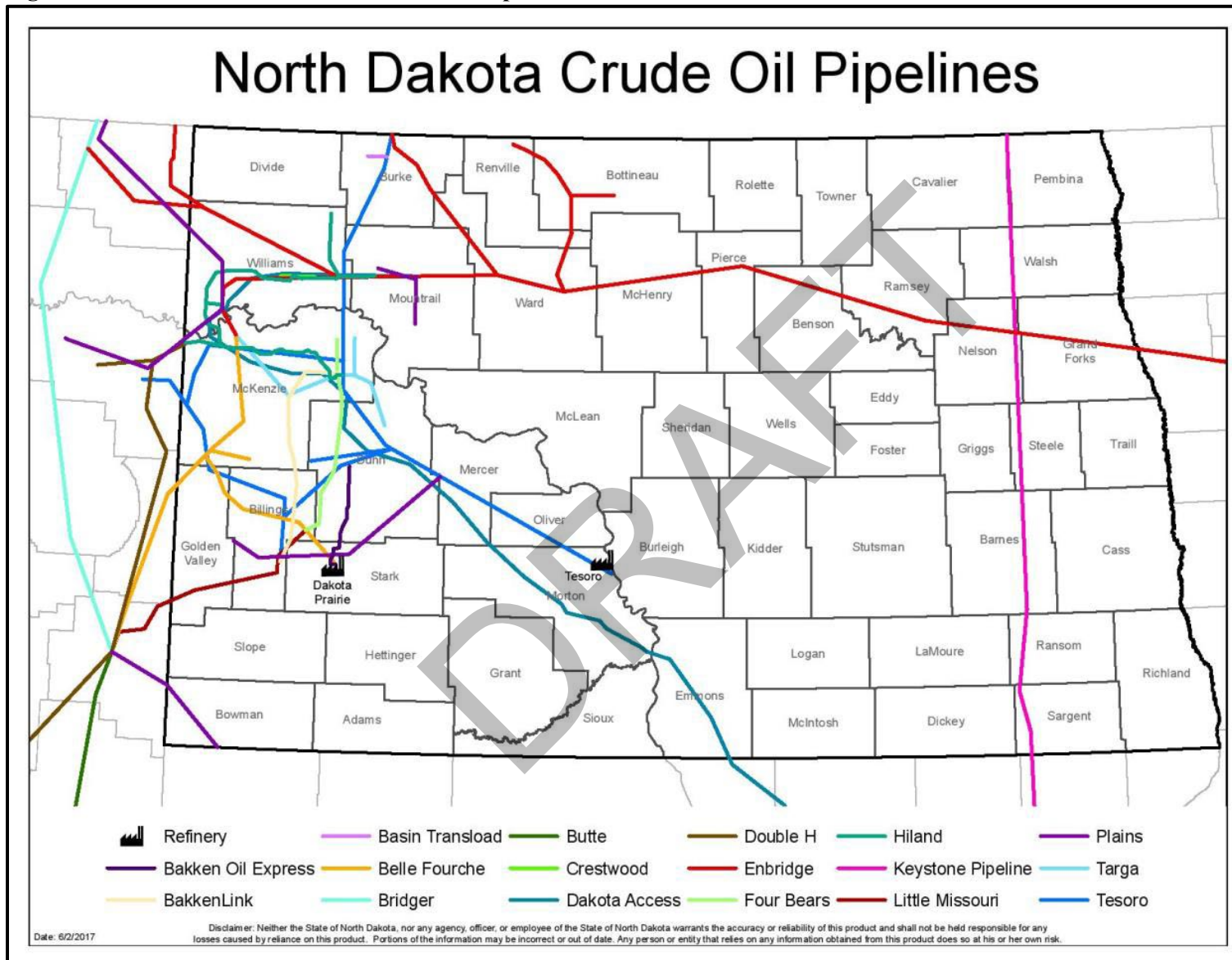
Vulnerabilities of Critical Facilities and Infrastructure

Like publicly-owned buildings and property, the vulnerability of the hazard/threat to critical facilities and infrastructure depends 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 the Wells County Courthouse, St. Aloisius Hospital & Medical Center or public schools could be shut down temporarily or indefinitely. The water towers in the cities of Fessenden and Harvey are located adjacent to CP Railway. If a release were to occur on a major roadway, emergency services would be limited and response times could be increased.

The St. Aloisius Hospital & Medical Center (which includes a care facility) is a critical facility located in the city of Harvey and is 2.5 blocks south of CP Railway. The hospital or emergency services could be shut down temporarily or indefinitely due to an incident. If a release were to occur on a major roadway, emergency services would be limited and response times could be reduced or eliminated. A release from the railroad would also impact on the hospital as it is located four blocks from the railroad tracks.

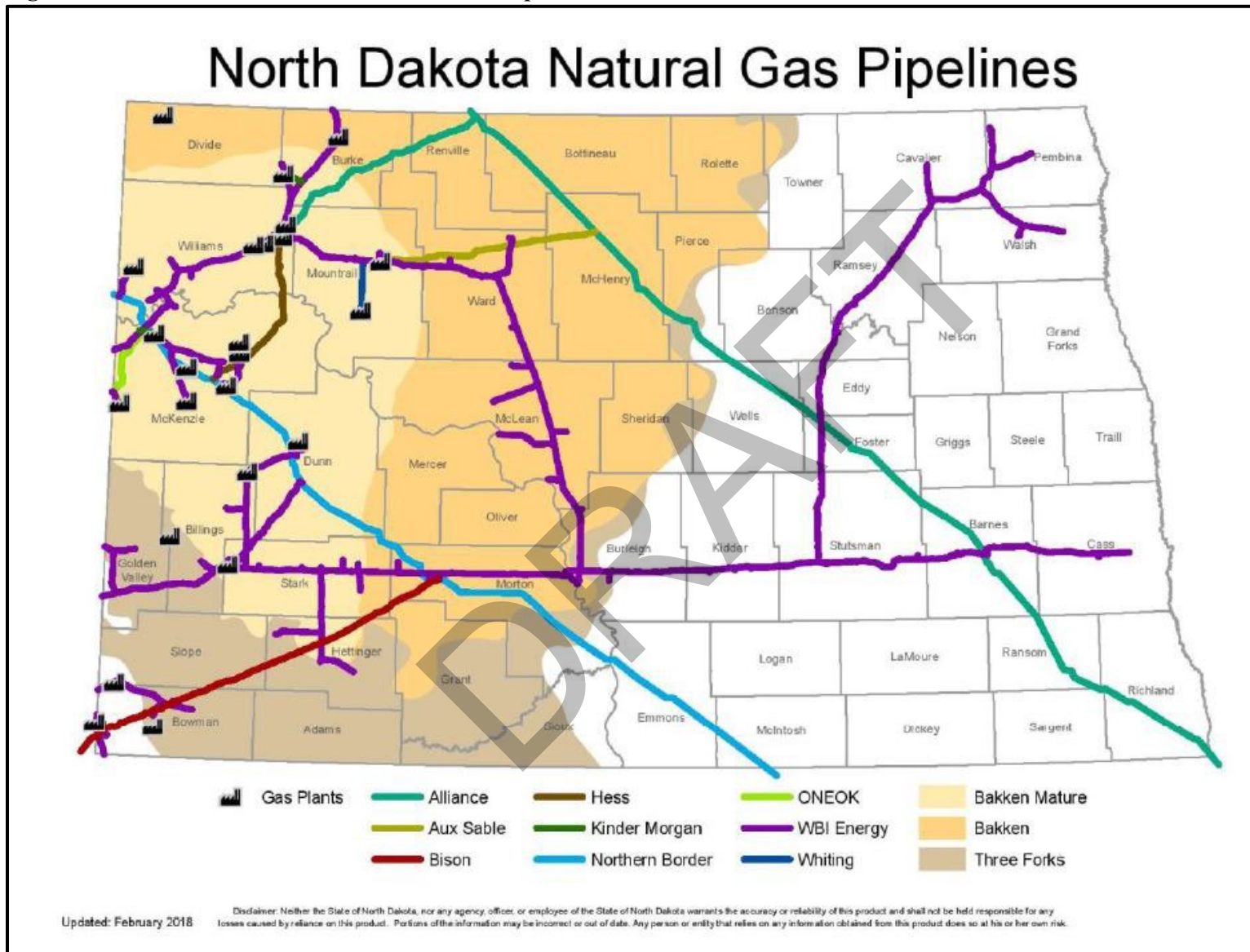
In addition, the fire hall for smaller incorporated jurisdictions is typically located near the highway and is vulnerable to hazardous material release.

Figure 4.9.2.1 – 2018 North Dakota Crude Oil Pipelines



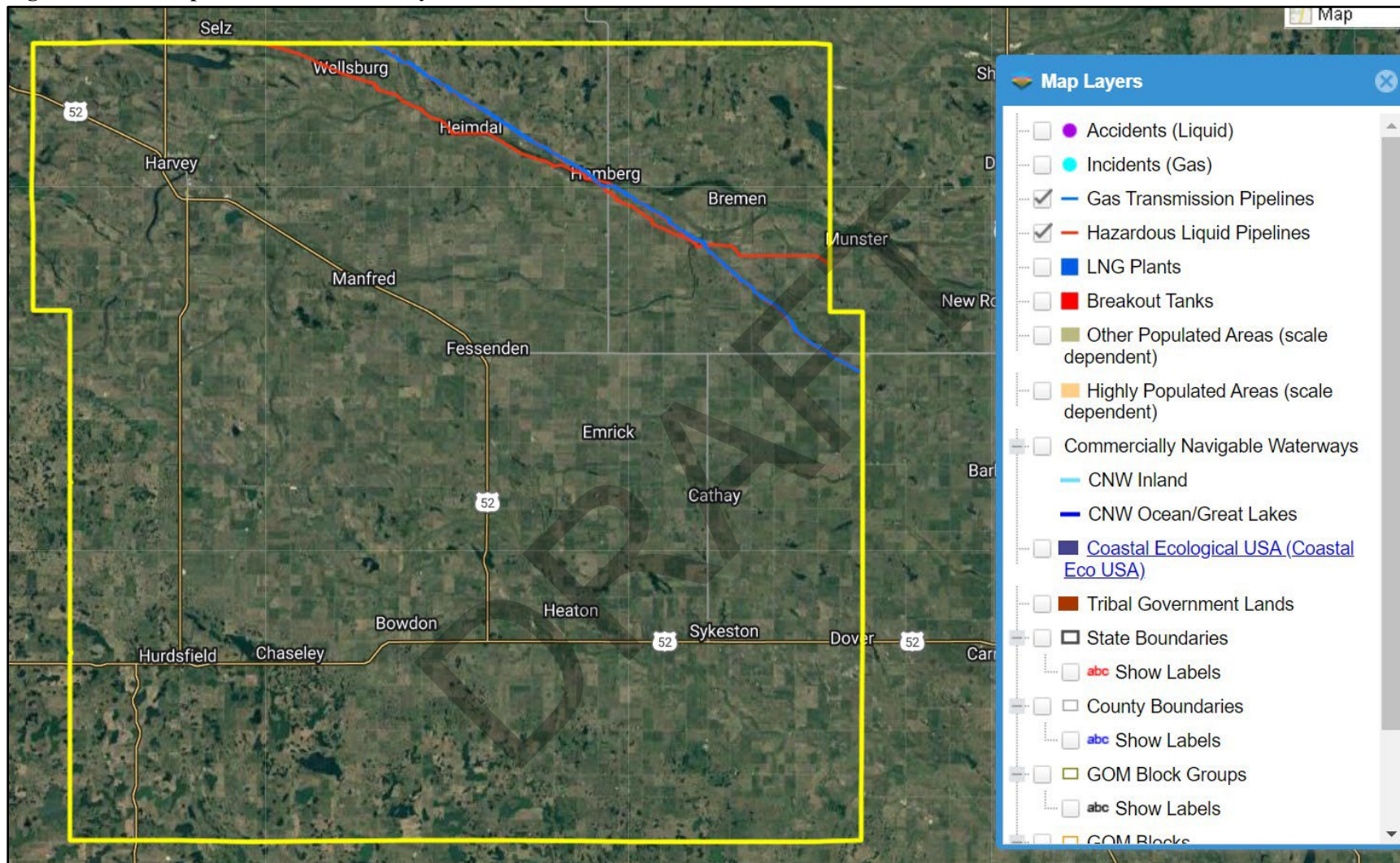
Source(s): 2018 N.D. Enhanced Mitigation MAOP

Figure 4.9.2.2 – 2018 North Dakota Natural Gas Pipelines



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

Figure 4.9.2.3 – Pipelines in Wells County, North Dakota



Source(s): National Pipeline Mapping System

Table 4.9.2.3 – Wells County, North Dakota Hazardous Material Release Risk Assessment

<p>Impact</p>	<ul style="list-style-type: none"> • Business Interruptions/Loss of Economy • Explosion • Environmental Degradation • Fuel Outage/Shortage • Human/Injury Death • Increased Public Safety Runs 	<ul style="list-style-type: none"> • Loss of Critical Facilities and Infrastructure • Loss/Overcrowded Medical Facilities • Loss of Transportation Systems/Accessibility - Blocking of roads when emergency services respond to incidents • Leaking fuel tanks contaminate local waterways and potable water supplies (individual wells)
<p>Frequency</p>	<ul style="list-style-type: none"> • 30 releases/spills were reported in Wells County from July 1982 to March 2020 • Heimdahl Train Derailment on May 6, 2015 	<ul style="list-style-type: none"> • Per Table 4.9.2.1, the largest reported spill/release was 60,000.00 gallons of crude oil on May 5, 2015.
<p>Likelihood</p>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> • Presence of N.D. Highways 3, 15, 30, and 200, and U.S. Highway 52 • Agriculture economy with heavy use of chemicals • Crop sprayers and private plane operators • Wells County has 27 tier II Sites • Large storage containers in city limits (propane, gasoline, anhydrous) • Propane tanks are main heating source throughout county • Anhydrous plants and major chemical suppliers in the county • One natural gas pipeline traversing Wells County 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> • Tier II reporting and regulations (fixed facilities only) • BNSF and CP Railroad infrastructure • No major interstate • No major commercial passenger airport • Ordinances regulating development/placement of HAZMAT • Fire departments have HAZMAT training
<p>Vulnerability</p>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • Presence of N.D. Highways 3, 15, 30, and 200, and U.S. Highway 52 • Agriculture economy with heavy use of chemicals • Crop sprayers and private plane operators • Wells County has 27 tier II Sites • Large storage containers in city limits (propane, gasoline, diesel) • Propane tanks are main heating source throughout rural areas of the county • Anhydrous plants and major chemical suppliers in the county • One natural gas pipeline traversing Wells County 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • Tier II reporting and regulations (fixed facilities only) • BNSF and CP Railroad infrastructure • No major interstate • No major commercial passenger airport • Ordinances regulating development/placement of HAZMAT • Fire departments have HAZMAT training • Winter months see decrease in ag-related chemicals • NDDES HAZConnect • Removal of one anhydrous ammonia site
<p>Capability</p>	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address hazardous material release. 	

Vulnerabilities to New and Future Development

The vulnerability of new and future development depends 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.

New development located near or adjacent to recreation areas in the extreme northwest corner of Wells County will be vulnerable to hazardous material releases from an existing natural gas pipeline and potential future development in the area. The county should update zoning ordinances to implement setbacks from hazardous material sites or infrastructure for new development from this infrastructure.

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. Hazardous materials should be prohibited from being 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/or care centers.**

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 incident, 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)
- 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)
- Wells County Comprehensive Plan (2014)

- Wells County Commercial Animal Feed Operation Ordinance
- Wells County Evacuation Plan through Wells County Emergency Management
- Wells County Local Emergency Operations Plan (LEOP)
- Wells County Mass Care Plan through Wells County Public Health
- Wells County Shelter Plan through Wells County Emergency Management
- Wells County Threat and Hazard Identification and Risk Assessment (THIRA)

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4.10 Infectious Disease & Pest Infestations

Including animal, human, and plant diseases.

Characteristics

Infectious disease and pest infestations are an illness 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.

Seasonal Pattern	<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>
Duration	Hours/Days/Weeks/Months/Years
Speed of Onset	<p><u>Disease.</u> Hours to weeks (12 hours for most diseases)</p> <p><u>Pest Infestations.</u> Hours to Days to Weeks</p>
Location	County-wide across all jurisdictions (incorporated and/or unincorporated)

For more information regarding infectious disease and pest infestations 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>

4.10.1 Infectious Disease & Pest Infestations – Eddy County, North Dakota

History

Information on infectious disease and pest infestations was obtained from the U.S. Dept. of Agriculture, Farm Services Agency (FSA); N.D. Dept of Health; U.S. Dept. of Agriculture, Risk Management Agency (RMA); Eddy County Emergency Management; First District Health Unit; and NDSU Extension/Eddy County. The history of infectious disease and pest infestations for animals, humans and plants is summarized for Eddy County in the following section. A detailed hazard history for Eddy County can be found on a disc located at the beginning of Chapter 4.

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 contributor to losses occurring under LIP. Between 2013 and 2021, the following was assumed to be paid to cover animal losses in Eddy County resulting from infectious disease and pest infestations:

- 2013: \$13,970.00
- 2014: \$12,805.00
- 2015: NA
- 2016: \$3,129.00
- 2017: \$2,136.00
- 2018: \$17,569.00
- 2019: \$71,232.00
- 2020: 604.00
- 2021: NA

Animal - Rabies. According to the N.D. Dept. of Health, Eddy County has experienced one case of rabies in animals in a cow in 2006, one case in a dog in 2007, one case in a skunk in 2008, one case in a cat in 2010, and one case in a cow in 2019.

Human. A history of infectious disease in humans is shown in Tables 4.10.1.1 and 4.10.1.2 in Eddy County. Table 4.10.1.1 shows the history of influenza by season, which is defined as between the months of August 1 to July 31 of any given year from 2010 to 2021. Table 4.10.1.2 shows the history of infectious diseases in Eddy County between 2004 and 2022.

- Between 2010 and 2021, Eddy County recorded an average of 11 cases of influenza annually. The 2019/2020 flu season had the highest number of reported cases at 33 followed by the 2018/2019 flu season where 26 cases were reported.

Table 4.10.1.1 – 2010 to 2021 Eddy County, North Dakota Influenza History

Infectious Disease	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
Influenza	2	1	7	4	6	2	15	24	26	33	1

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

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

- Aside from influenza, Eddy County recorded 157 infectious disease cases between 2004 and 2022, or an average of eight cases per year.
- Between 2004 and 2022, Eddy County recorded 75 cases of Chlamydia, 29 cases of Hepatitis C Chronic, and 18 cases of Gonorrhea, representing 47.8 percent, 18.5 percent, 11.5 percent, respectively.

Plant. Crop loss from infectious disease and pest infestations 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, 2022, Eddy County experienced 167 incidents of crop loss due to infectious disease and pest infestations impacting approximately 34,785.30 acres of crops totaling \$1,782,273.25 in losses.**

The NDSU Extension/Eddy 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 and pest infestations 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 and pest infestations in animals is \$13,493.89 in annual losses on average. Meeting participants indicated the probability of infectious disease and pest infestations in animals as “likely,” meaning that there is a 50 percent probability in the next year of an occurrence.

Human. Per the infectious disease and pest infestations history for humans in Eddy County, the probability of infectious disease and pest infestations is 100 percent. Meeting participants indicated the probability of infectious disease and pest infestations in humans as “likely,” meaning there is a 50 percent chance in the next year of an occurrence.

Plant. Per the infectious disease and pest infestations history for plants in Eddy County, the probability of infectious disease and pest infestations in any given year is approximately 100 percent. Meeting participants indicated the probability of infectious disease and pest infestations in crops as “highly likely,” meaning there is a 100 percent chance in the next year of an occurrence.

- There were 167 incidents of crop loss due to infectious disease and pest infestations and pest infestations between January 1, 2001, and December 31, 2022, resulting in approximately eight occurrences of crop loss annually.
- On average, crop losses from infectious disease and pest infestations and pest infestations impact 1,716.47 acres per year resulting in an average of \$86,293.28 in crop losses annually.

Table 4.10.1.2 – 2004 to 2022 Eddy County, North Dakota Human Infectious Disease History

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total by Disease	Percent by Disease	
Babesiosis	0	0	0	0	0	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	0	0	0	0.0%
Campylobacteriosis	1	0	1	1	1	0	0	1	0	2	0	0	0	1	0	0	2	0	0	9	5.7%	5.7%
Carbapenem	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Chicken Pox	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.6%	0.6%
Chlamydia	3	0	1	5	1	6	6	6	3	2	3	7	2	8	5	3	6	3	8	75	47.8%	47.8%
Coccidioidomycosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Cryptosporidiosis	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	2	1.3%	1.3%
E.coli, Shiga-Toxin Producing	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.6%	0.6%
Ehrlichiosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Giardiasis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Gonorrhea	0	0	0	0	0	0	1	1	0	0	1	1	2	3	1	1	2	3	2	18	11.5%	11.5%
Haemophilus	--	0	0	0	0	0	0	0	0	0	0	0	--	--	--	--	--	--	--	0	0.0%	0.0%
HBV	--	0	0	0	0	0	0	0	0	0	0	0	--	--	--	--	--	--	--	0	0.0%	0.0%
HCV	--	0	0	0	0	0	0	0	0	0	0	0	--	--	--	--	--	--	--	0	0.0%	0.0%
Hepatitis A	0	0	0	0	0	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	0	0	0	0.0%
Hepatitis B Chronic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Hepatitis C Acute	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Hepatitis C Chronic	1	4	2	1	2	3	0	0	0	0	1	3	3	1	4	1	1	3	0	29	18.5%	18.5%
Legionellosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Listeriosis	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Malaria	0	0	0	0	0	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	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	0	0	0	0.0%
Mumps	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Pertussis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Q Fever	0	0	0	0	0	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	0	0	0	0.0%
Rubella	0	0	0	0	0	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	0	0	0	0	0	1	1	0	0	0	0	0	0	3	1.9%	1.9%
Shigellosis	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.6%	0.6%	
Syphilis	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0.6%	0.6%	
Tetanus	0	0	0	0	0	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	0	0	0	0.0%
Tuberculosis	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0.6%	0.6%	
Tularemia	0	0	0	0	0	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	0	0	0	0.0%
TB-Active	--	0	0	0	0	0	0	0	0	0	0	0	--	--	--	--	--	--	--	0	0.0%	0.0%
TB-LTBI	--	0	0	0	0	0	0	0	0	0	0	0	--	--	--	--	--	--	--	0	0.0%	0.0%
Tularemia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Vancomycin	--	0	1	2	1	0	0	2	2	2	1	1	--	--	--	--	--	--	--	12	7.6%	7.6%
Vibrio Cholerae	--	0	0	0	0	0	0	0	0	0	0	0	--	--	--	--	--	--	--	0	0.0%	0.0%
West Nile Virus	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Total by Year	5	5	7	10	6	10	7	10	7	7	6	13	8	14	10	5	11	11	10	157	100.0%	

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

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 and pest infestations 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 and pest infestations cannot be determined.

- Figure 4.10.1.1 illustrates the cattle and calf inventory in North Dakota. Eddy County has 27,000 head as of 2018.
- A total of five cases of rabies were recorded in Eddy County between 2006 and 2022.
- Meeting participants indicated that with the local economy heavily dependent on agriculture, significant animal losses may have a catastrophic impact.

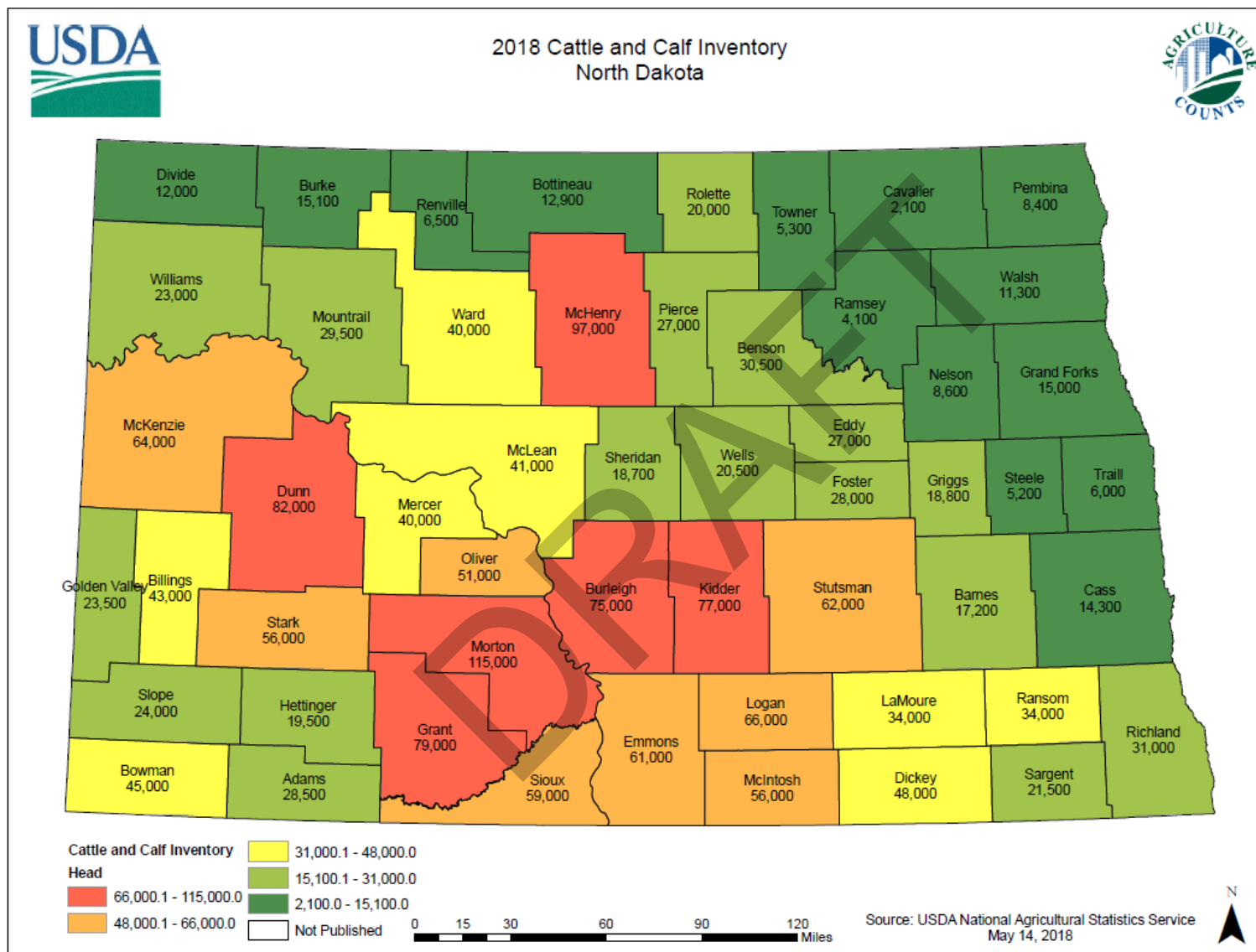
Human. The extent/magnitude of infectious disease and pest infestations for humans can range from low to high, depending on the disease involved, and the specific location of occurrence. If an outbreak occurred in a remote area where there is a shortage of health professionals, the extent/magnitude could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

- According to First District Health Unit, if a pandemic from a new strain of Influenza or Avian Flu occurred in Eddy County, the impact could be catastrophic, like the COVID-19 Pandemic. The COVID-19 pandemic resulted in seven fatalities in Eddy County as of December 2, 2022. 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 Eddy County. Approximately 22.5 percent of Eddy County residents contracted the disease as of October 2021.
- Influenza is an infectious disease and pest infestations 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 and pest infestations in humans has the potential to be catastrophic resulting from modern-day travel.
- Meeting participants indicated that infectious diseases in humans can have a catastrophic impact after what was experienced in Eddy County due to the COVID-19 Pandemic. The pandemic resulted in a temporary, but near total shutdown of local economic and human activity.

Plant. Per crop loss data from the RMA the following statistics illustrate the extent/magnitude of infectious disease and pest infestations and pest infestations on crops in Eddy County.

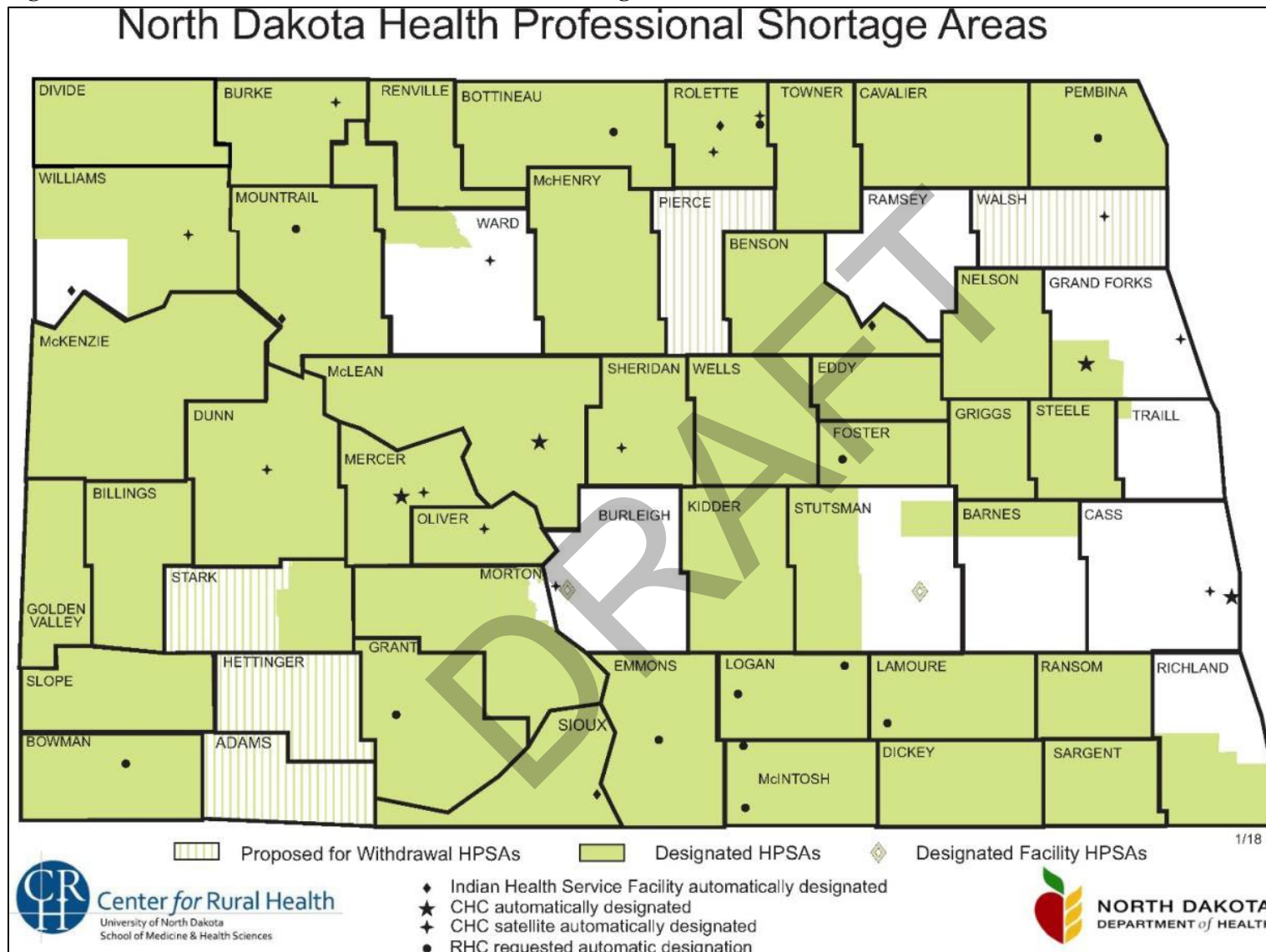
- Meeting participants indicated that with the local economy heavily dependent on agriculture, significant crop losses may have a catastrophic impact.

Figure 4.10.1.1 – 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 4.10.1.2 – 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 4.10.1.3 shows the risk assessment as determined by individual jurisdictions and the Plan Update Committee for infectious disease and pest infestations. The risk assessment methodology can be found in the beginning of Chapter 4, Threat and Hazard Identification Risk Assessment. The total in Table 4.10.1.3 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 4.10.1.3 – Eddy County, North Dakota Infectious Disease Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Eddy County – Human	4	2	3	4	2	11
Eddy County – Animal & Plant	4	4	4	4	3	12
City of New Rockford	2	2	2	3	1	8
City of Sheyenne	3	2	2	3	1	9

(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 and pest infestations in Eddy 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).

Vulnerabilities to Publicly-Owned Buildings and Property

Most structures remain unaffected by impacts from infectious disease and pest infestations 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 and pest infestations & pest infestations in animals, humans, and plants.

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

Table 4.10.1.4 – Eddy County, North Dakota Infectious Disease & Pest Infestations Risk Assessment - Animal

<p>Impact</p>	<ul style="list-style-type: none"> • Disease Outbreak/Mass Infections – (animals only) • Government Interruptions • Labor Shortages • Livestock Loss • Loss of Economy • Loss/Overcrowded Veterinarian Facilities • Loss of Drinking/Potable Water 	<ul style="list-style-type: none"> • Strain on local veterinarian resources • Financial cost to local producers and the public • Lack of awareness of public resulting from difficulties in communicating through media sources • Distress of local producers from a pandemic • Compression of supply chain can lead to supplies and vaccination shortages • Carcass disposal
<p>Frequency</p>	<ul style="list-style-type: none"> • Animal losses due to infectious disease and pest infestations occur annually • 15 – Norovirus • Kids get sick earlier and illness lasts longer • Annual influenza cases 	<ul style="list-style-type: none"> • A total of five cases of rabies were recorded in Eddy County between 2006 and 2022.
<p>Likelihood</p>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> • 27,000 head of cattle & calf in 2018 in the county • Agriculture economy • Dependent on weather for animals and crops • Transporting of animals across state lines • Overuse of antibiotics leading to disease tolerance 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> • Advanced communications such as internet and tv • Public health and employment regulations for public and private facilities, producers, etc. • Impact is highly dependent on the type of disease and its effect on the population of livestock
<p>Vulnerability</p>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • 27,000 head of cattle & calf in 2018 in the county • Agriculture economy • Dependent on weather for animals and crops • Transporting of animals across state lines • Overuse of antibiotics leading to disease tolerance • Shortage of veterinary service • Cross contamination between producers • Presence of insects 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • Advanced communications such as internet and tv • Public health and employment regulations for public and private facilities, producers, etc. • Veterinarian clinics in the county help address the need for services, but does not meet overall demand
<p>Capability</p>	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address infectious disease and pest infestations. 	

Table 4.10.1.5 – Eddy County, North Dakota Infectious Disease & Pest Infestations Risk Assessment - Human

<p>Impact</p>	<ul style="list-style-type: none"> • Human Injury/Death • Loss of Economy (crop, livestock, manufacturing, etc.) • Loss/Overcrowded Medical Facilities • Mass Casualties/Fatalities • Loss of Potable Water • School Closure • Compression of supply chain can lead to shortages of supplies and vaccinations • Disruptions in essential services and critical infrastructure operations due to lack of alternative staff 	<ul style="list-style-type: none"> • Financial cost to public health resources • Infrastructure degradation resulting from labor shortages • Mass casualties can overwhelm funeral homes • Labor shortages in medical facilities • Loss of capability to transfer patients to other facilities with higher levels of care • Psychological impacts to the public and medical community – medical staff leaving the profession • Loss confidence in local government
<p>Frequency</p>	<ul style="list-style-type: none"> • Annual occurrences of death, primarily among elderly • Occurrence of 1 in 3 for people annually • 157 infectious disease cases between 2004 and 2022 in Eddy County, or roughly eight cases per year 	<ul style="list-style-type: none"> • Between 2004 and 2022, Eddy County recorded 75 cases of Chlamydia, 29 cases of Hepatitis C Chronic, and 18 cases of Gonorrhea, representing 47.8 percent, 18.5 percent, 11.5 percent, respectively.
<p>Likelihood</p>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> • Growing elderly population • Public schools, daycares, and skilled nursing, assisted living, and group homes • Increasing number of adults avoiding COVID-19 vaccinations for themselves and their children • Small increase in avoidance of vaccinating in general • Emergence of the COVID-19 variants 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> • Advanced communications such as internet and tv promoting wellness and preventative measures – conducted through public health and Eddy County • Public health and employment regulations for public and private facilities, producers, etc. • Immunizations & medications • Lower population • Wearing of face coverings (when needed)

Table 4.10.6 – Eddy County, North Dakota Infectious Disease & Pest Infestations Risk Assessment – Human – CONTINUED

<p>Likelihood</p>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> • Breakthrough COVID-19 cases in vaccinated individuals • Unvaccinated individuals are more likely to contract COVID compared to vaccinated individuals and are more likely to be hospitalized • Resistance of the public to mask wearing and following of isolation/quarantine guidelines 		
<p>Vulnerability</p>	<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"> • Growing elderly population • Increase in mobility and air travel • Shortage of health professionals in Eddy County • Shortage of advanced medical equipment – i.e., ventilators, bipap, bypass, dialysis, air and surface-sterilization • The prevalence of social media increasing skepticism of disease prevention measures • Public schools, daycares, and skilled nursing, assisted living, and group homes • N.D. State Legislature voted in 2021 that the State Health Officer and the Governor cannot implement a mask mandate • Emergence of the COVID-19 variants • Breakthrough COVID-19 cases in vaccinated individuals • No hospital in Eddy County </td> <td style="width: 50%; vertical-align: top;"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • Advanced communications such as internet and tv promoting wellness and preventative measures • Public health and employment regulations for public and private facilities, producers, etc. • Immunizations & medications • The population density of the rural parts of Eddy County is sparse and the rural setting allows for immediate social distancing • Colder climate limits social interactions • New Rockford Ambulance Services • Adequate storage space and refrigeration units for stockpile of medical supplies at First District Health Unit in Devils Lake • Eddy County is ranked as having a low social vulnerability • N.D. Dept. of Health is statutorily responsible for disease outbreaks – local public health departments work under this direction by way of an MOU </td> </tr> </table>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • Growing elderly population • Increase in mobility and air travel • Shortage of health professionals in Eddy County • Shortage of advanced medical equipment – i.e., ventilators, bipap, bypass, dialysis, air and surface-sterilization • The prevalence of social media increasing skepticism of disease prevention measures • Public schools, daycares, and skilled nursing, assisted living, and group homes • N.D. State Legislature voted in 2021 that the State Health Officer and the Governor cannot implement a mask mandate • Emergence of the COVID-19 variants • Breakthrough COVID-19 cases in vaccinated individuals • No hospital in Eddy County 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • Advanced communications such as internet and tv promoting wellness and preventative measures • Public health and employment regulations for public and private facilities, producers, etc. • Immunizations & medications • The population density of the rural parts of Eddy County is sparse and the rural setting allows for immediate social distancing • Colder climate limits social interactions • New Rockford Ambulance Services • Adequate storage space and refrigeration units for stockpile of medical supplies at First District Health Unit in Devils Lake • Eddy County is ranked as having a low social vulnerability • N.D. Dept. of Health is statutorily responsible for disease outbreaks – local public health departments work under this direction by way of an MOU
<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • Growing elderly population • Increase in mobility and air travel • Shortage of health professionals in Eddy County • Shortage of advanced medical equipment – i.e., ventilators, bipap, bypass, dialysis, air and surface-sterilization • The prevalence of social media increasing skepticism of disease prevention measures • Public schools, daycares, and skilled nursing, assisted living, and group homes • N.D. State Legislature voted in 2021 that the State Health Officer and the Governor cannot implement a mask mandate • Emergence of the COVID-19 variants • Breakthrough COVID-19 cases in vaccinated individuals • No hospital in Eddy County 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • Advanced communications such as internet and tv promoting wellness and preventative measures • Public health and employment regulations for public and private facilities, producers, etc. • Immunizations & medications • The population density of the rural parts of Eddy County is sparse and the rural setting allows for immediate social distancing • Colder climate limits social interactions • New Rockford Ambulance Services • Adequate storage space and refrigeration units for stockpile of medical supplies at First District Health Unit in Devils Lake • Eddy County is ranked as having a low social vulnerability • N.D. Dept. of Health is statutorily responsible for disease outbreaks – local public health departments work under this direction by way of an MOU 		

Table 4.10.6 – Eddy County, North Dakota Infectious Disease & Pest Infestations Risk Assessment – Human – CONTINUED

Vulnerability	<u>More Vulnerable</u>	<u>Less Vulnerable</u>
	<ul style="list-style-type: none"> • Resistance of the public to mask wearing and following of isolation/quarantine guidelines • Delay of information sharing about disease trends to local public health from state department of health • Delay of information sharing due to local paper only publishing weekly • Lack of local epidemiologist providing specific disease statistics and reporting for Eddy County • Lack of indoor drive-through mass vaccinating/testing facility • Lack of backup generators for emergency services • Lack of consistent information from state leaders • Lack of refrigeration storage in the county courthouse • Infectious disease statistics is not always indicative of community spread as not all cases of disease are reported 	<ul style="list-style-type: none"> • First District Health Unit • Regional and state epidemiologists working with local public health to manage disease outbreaks • Regional Public Information Officer (PIO) • Regional Environmental Health Practitioner • Regional Emergency Preparedness and Response Coordinator • Eddy County PIO • Eddy County has a low Social Vulnerability Index per the CDC as of 2021 • Mass media/internet • Spraying for mosquitos
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address infectious disease. 	

Table 4.10.7 – Eddy County, North Dakota Infectious Disease & Pest Infestations Risk Assessment - Plant

Impact	<ul style="list-style-type: none"> • Crop Loss • Disease Outbreak/Mass Infections (plants only) • Livestock Loss • Loss of Economy • Soil Erosion 	<ul style="list-style-type: none"> • Strain on local, state, and federal governments resources, and private enterprise • Between January 1, 2001, and December 31, 2022, Eddy County experienced 167 incidents of crop loss due to infectious disease and pest infestations impacting approximately 37,762.37 acres of crops totaling \$1,898,452.25 in losses.
Frequency	<ul style="list-style-type: none"> • Crop loss due to infectious disease and pest infestations occurs annually 	<ul style="list-style-type: none"> • On average, crop losses from infectious disease and pest infestations impact 1,716.47 acres per year resulting in an average of \$86,296.28 in crop losses annually in Eddy County.
Likelihood	<p><u>More Likely</u></p> <ul style="list-style-type: none"> • Agriculture economy • Dependent on weather for animals and crops 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> • Advanced communications such as internet and tv • Public health and employment regulations for public and private facilities, producers, etc. • Pesticide Training facilitated by NDSU Extension/Eddy County
Vulnerability	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • Agriculture economy • Dependent on weather for animals and crops • Cross contamination between producers • Presence of insects 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • Advanced communications such as internet and tv • Public health and employment regulations for public facilities • Pesticide Training facilitated by NDSU Extension/Eddy County
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address infectious disease & pest infestations. 	

Vulnerabilities of Critical Facilities and Infrastructure

Since animals, humans and plants are affected by infectious disease and pest infestations, critical facilities and infrastructure are unaffected in structural terms. However, critical facilities such as public health, clinics, hospitals, and veterinarian clinics can become contaminated and/or quickly overwhelmed if an outbreak/pandemic of infectious disease and pest infestations 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 and pest infestations 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 and pest infestations 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 and pest infestations through contamination, or through quarantine of a large portion of a given population that could delay physical maintenance and/or repair to infrastructure. The age of the drinking/potable water system in the cities of New Rockford and Sheyenne results in numerous water line breaks, which can contribute to higher rates of infectious disease and pest infestations in humans.

Due to the presence of the livestock industry in Eddy 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 and pest infestations in animals, humans, and plants.

Vulnerabilities to New and Future Development

New development would avoid physical impact from infectious disease and pest infestations and not be vulnerable. While mold may make a building uninhabitable, it is not an infectious disease and pest infestations. 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 and pest infestations in animals, humans, and plants.

Population growth or decline, attributable to new and future development, will either increase or decrease the vulnerability to infectious disease and pest infestations. Similarly, population growth in livestock could increase or decrease the vulnerability to infectious disease and pest infestations.

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 and pest infestations. Similarly, the Farm Services Agency (FSA) provided information on payments made through the Livestock Indemnity Program (LIP), but the cause of the loss and the number of animals impacted is not available. For plan development purposes, statistics from the LIP program are included in the infectious disease and pest infestations profile.

Statistics on infectious disease and pest infestations 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 and pest infestations in humans available on the N.D. Dept. of Health website cannot be downloaded and must be manually compiled and analyzed. Statistics on influenza and COVID-19 are shown in separate sections on the department's website from all other infectious diseases and pest infestations 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 due to infectious disease and pest infestations 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)
- Centers for Disease Control Social Vulnerability Index, Eddy County, North Dakota
- Eddy County Local Emergency Operations Plan (LEOP)
- Eddy County Continuity of Operations Plan
- Eddy County Mass Vaccination Plan through First District Health Unit
- Eddy County Pandemic Influenza Response Plan through First District Health Unit
- Eddy County Point of Dispensing Plan (POD) through First District Health Unit
- Eddy County Mass Care Plan through First District Health Unit
- Eddy County Shelter Plan through Eddy County Emergency Management
- Eddy County Threat and Hazard Identification and Risk Assessment (THIRA)
- 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)

DRAFT

4.10.2 Infectious Disease & Pest Infestations – Wells County, North Dakota

History

Information on infectious disease and pest infestations was obtained from the U.S. Dept. of Agriculture, Farm Services Agency (FSA); N.D. Dept of Health & Human Services; U.S. Dept. of Agriculture, Risk Management Agency (RMA); Wells County Public Health (WCPH); Wells County Emergency Management; and NDSU Extension/Wells County. The history of infectious disease and pest infestations for animals, humans and plants is summarized for Wells County in the following section. A detailed hazard history for Wells County can be found on a disc located at the beginning of Chapter 4.

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 2021, the following was assumed to be paid to cover animal losses in Wells County resulting from infectious disease and pest infestations:

- 2013: NA
- 2014: \$66,550.00
- 2015: \$35,439.00
- 2016: \$53,774.00
- 2017: \$53,123.00
- 2018: \$8,605.00
- 2019: \$62,596.00
- 2020: \$758.00
- 2021: NA

Animal - Rabies. According to the N.D. Dept. of Health, Wells County has experienced one case of rabies in a cat in 2006; one case in a dog in 2008; one case in a cow, one case in a dog and one case in a skunk in 2010; one case in a skunk in 2011; three cases in skunks in 2013; one case in a skunk in 2014; one case in a skunk in 2018; one case in a skunk in 2019, and two cases in skunks in 2021.

Human. A history of infectious disease in humans is shown in Tables 4.10.2.1 and 4.10.2.2 in Wells County. Table 4.10.2.1 shows the history of influenza by season, which is defined as between the months of August 1 to July 31 of any given year from 2010 to 2021. Table 4.10.2.2 shows the history of infectious disease in Wells County between 2004 and 2022.

- Between 2010 and 2021, Wells County recorded an average of 22 cases of influenza annually. The 2017/2018 flu season had the highest number of reported cases at 58 followed by the 2016/2017 flu season where 46 cases were reported.

Table 4.10.2.1 – 2010 to 2021 Wells County, North Dakota Influenza History

Infectious Disease	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
Influenza	6	5	16	17	23	1	46	58	28	34	2

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

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

- Aside from influenza, Wells County recorded 356 infectious disease cases between 2004 and 2021, or an average of 19 cases per year.
- Between 2004 and 2022, Wells County recorded 62 cases of Chlamydia, 26 cases of Hepatitis C Chronic, 19 cases of Vancomycin, and 15 cases of West Nile Virus, representing 33.5 percent, 14.1 percent, 10.3 percent, and 8.1 percent of reported infectious diseases, respectively.

Plant. Crop loss from infectious disease and pest infestations 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, 2022, Wells County experienced 254 incidents of crop loss due to infectious disease and pest infestations impacting approximately 92,462.92 acres of crops totaling \$5,739,711.81 in losses.**

The NDSU Extension/Wells 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 and pest infestations 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 \$31,205.00 in annual losses on average. Meeting participants indicated the probability of infectious disease and pest infestations in animals as “highly likely,” meaning there is a 100 percent probability in the next year of an occurrence.

Human. Per the infectious disease history for humans in Wells County, the probability of infectious disease is 100 percent. Meeting participants indicated the probability of infectious disease and pest infestations in humans as “likely,” meaning there is a 50 percent chance in the next year of an occurrence.

Plant. Per the infectious disease history for plants in Wells County, the probability of infectious disease and pest infestations in any given year is approximately 100 percent. Meeting participants indicated the probability of infectious disease and pest infestations in crops as “highly likely,” meaning there is a 100 percent chance in the next year of an occurrence.

- There were 107 incidents of crop loss due to infectious disease and pest infestations between January 1, 2001, and December 31, 2022, resulting in approximately 12 of crop loss annually.
- On average, crop losses from infectious disease and pest infestations impact 4,202.86 acres per year resulting in an average of \$260,895.99 in crop losses annually.

Table 4.10.2.2 – 2004 to 2022 Wells County, North Dakota Human Infectious Disease History

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total by Disease	Percent by Disease	
Babesiosis	0	0	0	0	0	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	0	0	0	0.0%
Campylobacteriosis	2	0	1	0	0	1	1	0	0	3	0	1	2	0	0	0	3	2	0	0	14	3.9%
Carbapenem	--	0	0	0	0	0	0	0	0	0	0	0	--	--	--	--	--	--	--	--	0	0.0%
Chicken Pox	0	0	0	0	0	1	4	0	0	0	0	1	0	2	0	0	0	0	0	0	8	2.2%
Chlamydia	1	1	5	5	5	2	2	2	5	4	6	4	6	3	2	1	6	3	0	62	17.4%	
Coccidioidomycosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0.3%
Cryptosporidiosis	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0.6%
E.coli, Shiga-Toxin Producing	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	1	0	5	1.4%
Ehrlichiosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Giardiasis	0	0	0	0	1	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	4	1.1%
Gonorrhea	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	5	0	0	9	2.5%
Haemophilus	--	0	0	0	1	0	0	0	0	0	0	0	--	--	--	--	--	--	--	--	1	0.3%
HBV	--	0	0	0	0	0	0	0	0	0	0	0	--	--	--	--	--	--	--	--	0	0.0%
HCV	--	0	0	0	0	0	0	0	0	0	0	0	--	--	--	--	--	--	--	--	0	0.0%
Hepatitis A	0	0	0	0	0	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	0	0	0	0.0%
Hepatitis B Chronic	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0.6%
Hepatitis C Acute	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Hepatitis C Chronic	0	1	1	3	0	2	3	2	1	2	2	0	1	0	3	2	3	0	0	26	7.3%	
Influenza		21	7	25	22	26	1	5	12	22	18	10	2	0	0	0	0	0	0	0	171	48.0%
Legionellosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Listeriosis	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Malaria	0	0	0	0	0	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	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	0	0	0	0.0%
Mumps	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Pertussis	10	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3%
Q Fever	0	0	0	0	0	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	1	0	0	1	0	0	0	0	0	1	0	0	0	0	3	0.8%
Rubella	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Salmonellosis	0	0	0	0	0	1	1	0	0	2	0	1	0	0	0	1	0	2	2	10	2.8%	
Shigellosis	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0.6%	
Syphilis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Tetanus	0	0	0	0	0	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	0	0	0	0.0%
Tuberculosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Tularemia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
TB-Active	--	0	0	0	0	0	0	0	0	0	0	--	--	--	--	--	--	--	--	--	0	0.0%
TB-LTBI	--	0	0	0	0	0	0	0	0	0	0	--	--	--	--	--	--	--	--	--	0	0.0%
Tularemia	0	0	0	0	0	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	0	0	0	0.0%
Vancomycin	--	0	2	0	0	0	4	5	6	2	0	0	--	--	--	--	--	--	--	--	19	5.3%
Vibrio Cholerae	--	0	0	0	0	0	0	0	0	1	0	0	--	--	--	--	--	--	--	--	1	0.3%
West Nile Virus	1	0	1	5	1	0	1	0	0	2	0	0	4	0	1	0	0	0	0	0	15	4.2%
Total by Year	14	23	20	38	31	34	18	15	24	39	30	19	18	5	7	10	17	6	2	356	100.0%	

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

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.

- Figure 4.10.2.1 illustrates the cattle and calf inventory in North Dakota. Wells County has 20,500 head as of 2018.
- A total of 14 cases of rabies were recorded in Wells County between 2006 and 2021.
- Meeting participants indicated that with the local economy heavily dependent on agriculture, significant animal losses may have a catastrophic impact.

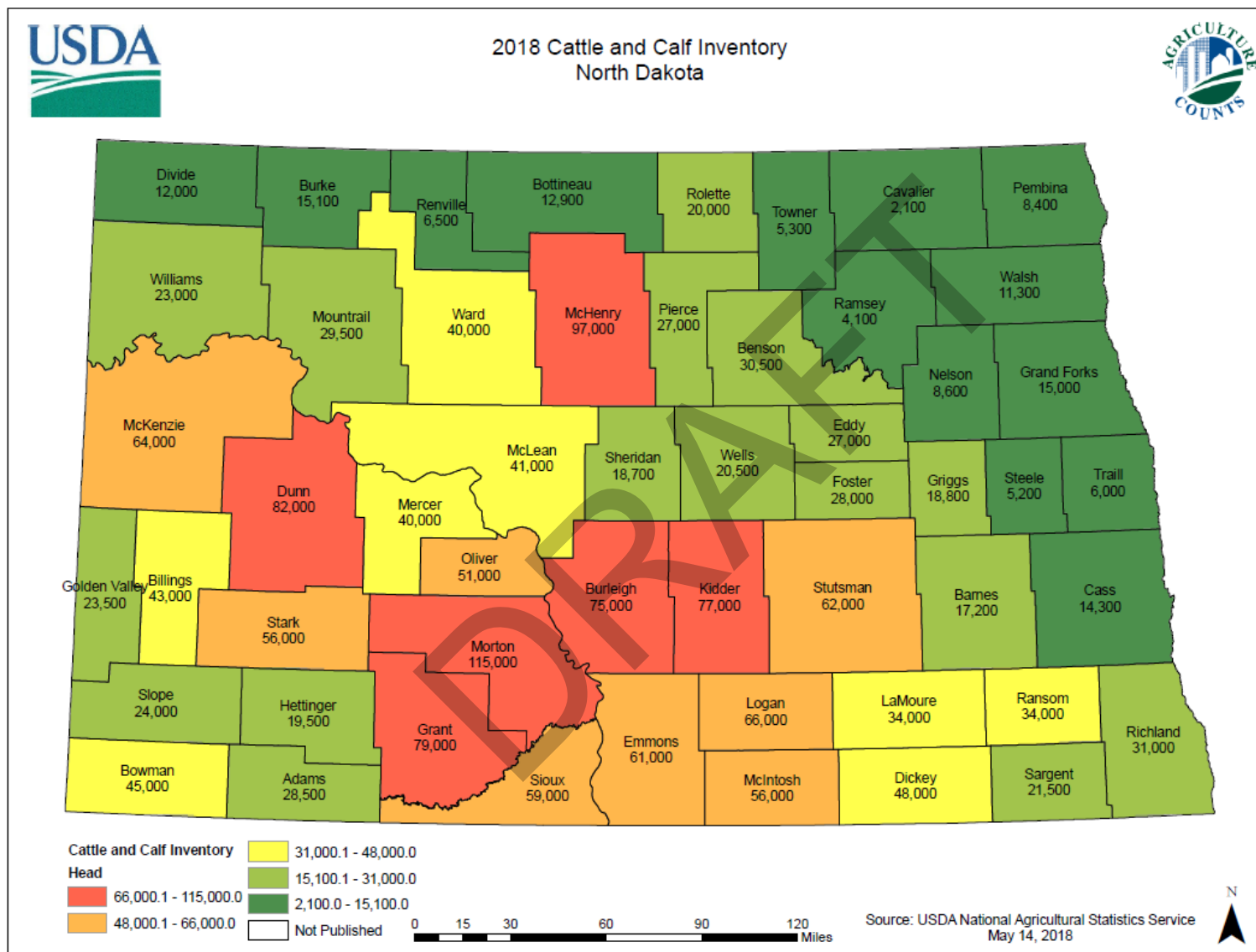
Human. The extent/magnitude of infectious disease for humans can range from low to high, depending on the disease involved, and the specific location of occurrence. If an outbreak occurred in a remote area where there is a shortage of health professionals, the extent/magnitude could be catastrophic.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

- According to Wells County Public Health, if a pandemic from a new strain of Influenza or Avian Flu occurred in Wells County, the impact could be catastrophic, like the COVID-19 Pandemic. The COVID-19 pandemic resulted in seven fatalities in Wells County as of December 2, 2022. 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 Wells County. Approximately 22.5 percent of Wells County residents contracted the disease as of October 2021.
- 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 diseases in humans can have a catastrophic impact after what was experienced in Wells County due to the COVID-19 Pandemic. The pandemic resulted in a temporary, but near total shutdown of local economic and human activity.

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

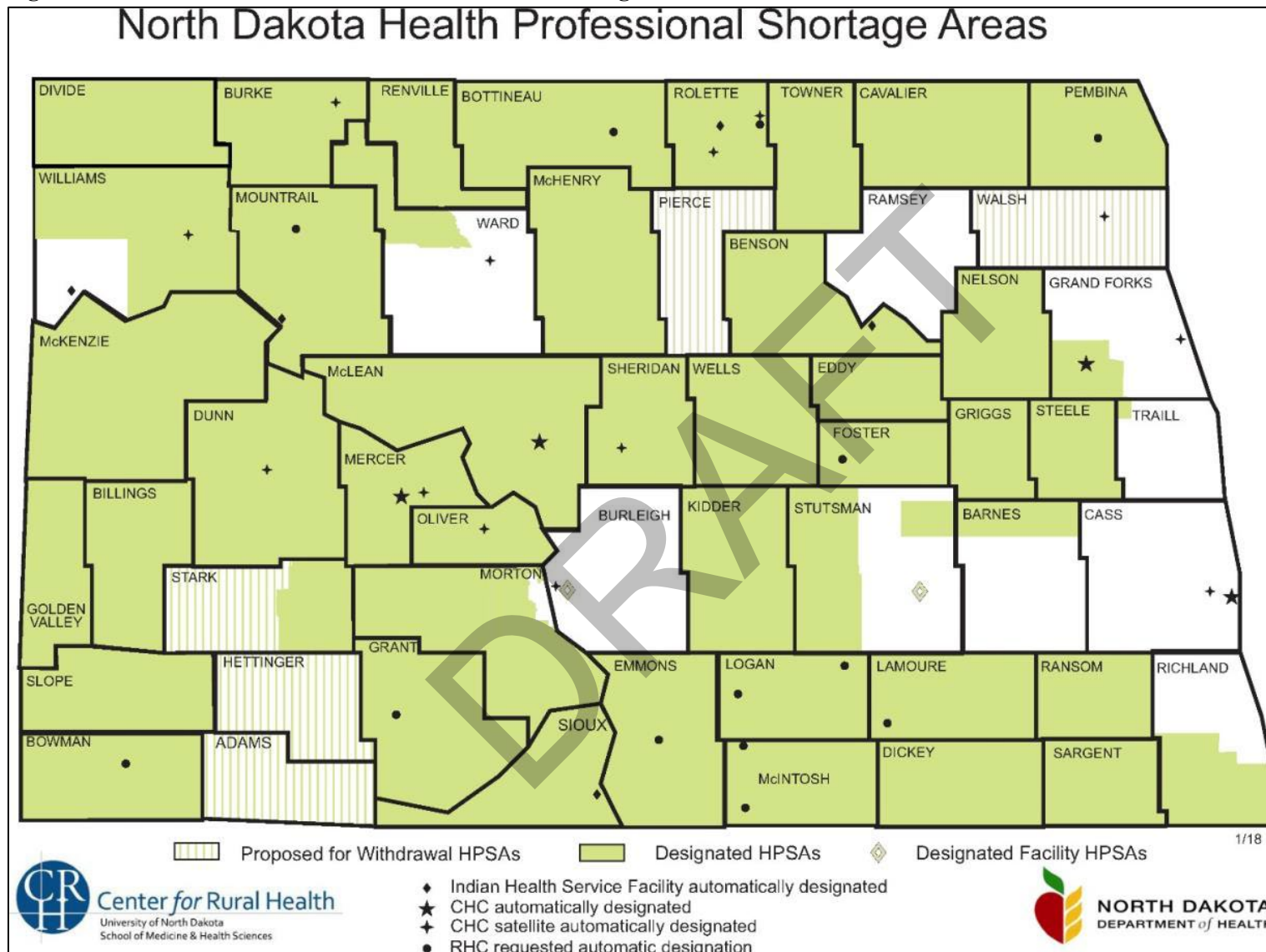
- Meeting participants indicated that with the local economy heavily dependent on agriculture, significant crop losses may have a catastrophic impact.

Figure 4.10.2.1 – 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 4.10.2.2 – 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 4.10.2.3 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 4.10.2.3 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 4.10.2.3 – Wells County, North Dakota Infectious Disease & Pest Infestations Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Wells County – Human	4	2	3	2	2	9
Wells County – Animal & Plant	4	4	4	4	2	13
City of Bowdon	2	2	2	3	1	8
City of Cathay	2	2	2	3	1	8
City of Fessenden	3	2	2	2	1	8
City of Hamberg	2	2	2	3	1	8
City of Harvey	3	4	2	4	2	13
City of Hurdsfield	2	2	2	3	1	8
City of Sykeston	2	2	3	3	1	9

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

Tables 4.10.2.4, 4.10.2.5, and 4.10.2.6 provide information on the specific impact, frequency, likelihood, vulnerability, and capability of infectious disease in Wells 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 4.10.2.4 – Wells County, North Dakota Infectious Disease & Pest Infestations Risk Assessment - Animal

<p>Impact</p>	<ul style="list-style-type: none"> • Disease Outbreak/Mass Infections – (animals only) • Government Interruptions • Labor Shortages • Livestock Loss • Loss of Economy • Loss/Overcrowded Veterinarian Facilities • Loss of Drinking/Potable Water 	<ul style="list-style-type: none"> • Strain on local veterinarian resources • Financial cost to local producers and the public • Lack of awareness of public resulting from difficulties in communicating through media sources • Distress of local producers from a pandemic • Compression of supply chain can lead to supplies and vaccination shortages • Carcass disposal
<p>Frequency</p>	<ul style="list-style-type: none"> • Animal losses due to infectious disease occur annually • 2009 – H1N1 • 2015 – Norovirus 	<ul style="list-style-type: none"> • 14 rabies case was reported in Wells County between 2006 and 2021 • Kids get sick earlier and illness lasts longer • Annual influenza cases
<p>Likelihood</p>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> • 20,500 head of cattle & calf in 2018 in the county • Agriculture economy • Dependent on weather for animals and crops • Transporting of animals across state lines • N.D. Highway 200 & U.S. Highway 52 = heavy livestock traffic • Overuse of antibiotics leading to disease tolerance 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> • Advanced communications such as internet and tv • Public health and employment regulations for public and private facilities, producers, etc. • Impact is highly dependent on the type of disease and its effect on the population of livestock
<p>Vulnerability</p>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • 20,500 head of cattle & calf in 2018 in the county • Agriculture economy • Dependent on weather for animals and crops • Transporting of animals across state lines • N.D. Highway 200 & U.S. Highway 52 = heavy livestock traffic • Overuse of antibiotics leading to disease tolerance • Shortage of veterinary service 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • Advanced communications such as internet and tv • Public health and employment regulations for public and private facilities, producers, etc. • Veterinarian clinics in the county help address the need for services, but does not meet overall demand
<p>Capability</p>	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address infectious disease. 	

Table 4.10.2.5 – Wells County, North Dakota Infectious Disease & Pest Infestations Risk Assessment - Human

<p>Impact</p>	<ul style="list-style-type: none"> • Human Injury/Death • Loss of Economy (crop, livestock, manufacturing, etc.) • Loss/Overcrowded Medical Facilities • Mass Casualties/Fatalities • Loss of Potable Water • School Closure • Compression of supply chain can lead to shortages of supplies and vaccinations • Disruptions in essential services and critical infrastructure operations due to lack of alternative staff 	<ul style="list-style-type: none"> • Financial cost to public health resources • Infrastructure degradation resulting from labor shortages • Mass casualties can overwhelm funeral homes • Labor shortages in medical facilities • Loss of capability to transfer patients to other facilities with higher levels of care • Psychological impacts to the public and medical community – medical staff leaving the profession • Loss confidence in local government
<p>Frequency</p>	<ul style="list-style-type: none"> • Annual occurrences of death, primarily among elderly • Occurrence of 1 in 3 for people annually • 185 infectious disease cases between 2004 and 2022 in Wells County, or roughly 10 cases per year 	<ul style="list-style-type: none"> • Between 2004 and 2022, Wells County recorded 62 cases of Chlamydia, 26 cases of Hepatitis C Chronic, 19 cases of Vancomycin, and 15 cases of West Nile Virus, representing 33.5 percent, 14.1 percent, 10.3 percent, and 8.1 percent of reported infectious diseases, respectively.
<p>Likelihood</p>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> • Growing elderly population • Public schools, daycares, and skilled nursing, assisted living, and group homes • Increasing number of adults avoiding COVID-19 vaccinations for themselves and their children • Small increase in avoidance of vaccinating in general • Emergence of the COVID-19 variants 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> • Advanced communications such as internet and tv promoting wellness and preventative measures – conducted through public health and Wells County • Public health and employment regulations for public and private facilities, producers, etc. • Immunizations & medications • Lower population • Wearing of face coverings (when needed)

Table 4.10.2.5 – Wells County, North Dakota Infectious Disease & Pest Infestations Risk Assessment – Human – CONTINUED

<p>Likelihood</p>	<p><u>More Likely</u></p> <ul style="list-style-type: none"> • Breakthrough COVID-19 cases in vaccinated individuals • Unvaccinated individuals are more likely to contract COVID compared to vaccinated individuals and are more likely to be hospitalized • Resistance of the public to mask wearing and following of isolation/quarantine guidelines 		
<p>Vulnerability</p>	<table border="0"> <tr> <td data-bbox="405 573 1123 1338"> <p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • Growing elderly population • Increase in mobility and air travel • Shortage of health professionals in Wells County • Shortage of advanced medical equipment – i.e., ventilators, bipap, bypass, dialysis, air and surface-sterilization • The prevalence of social media increasing skepticism of disease prevention measures • Public schools, daycares, and skilled nursing, assisted living, and group homes • N.D. State Legislature voted in 2021 that the State Health Officer and the Governor cannot implement a mask mandate • Emergence of the COVID-19 variants • Breakthrough COVID-19 cases in vaccinated individuals </td> <td data-bbox="1123 573 1877 1338"> <p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • Advanced communications such as internet and tv promoting wellness and preventative measures • Public health and employment regulations for public and private facilities, producers, etc. • Immunizations & medications • The population density of the rural parts of Wells County is sparse and the rural setting allows for immediate social distancing • Colder climate limits social interactions • Wells County Public Health • St. Aloisius Hospital and Care Center • Part-time clinics in Fessenden and Harvey • Harvey, Fessenden and Bowdon Ambulance Services • Adequate storage space and refrigeration units for stockpile of medical supplies at Wells County Public Health in Fessenden • Wells County is ranked as having a low social vulnerability • N.D. Dept. of Health is statutorily responsible for disease outbreaks – local public health departments work under this direction by way of an MOU </td> </tr> </table>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • Growing elderly population • Increase in mobility and air travel • Shortage of health professionals in Wells County • Shortage of advanced medical equipment – i.e., ventilators, bipap, bypass, dialysis, air and surface-sterilization • The prevalence of social media increasing skepticism of disease prevention measures • Public schools, daycares, and skilled nursing, assisted living, and group homes • N.D. State Legislature voted in 2021 that the State Health Officer and the Governor cannot implement a mask mandate • Emergence of the COVID-19 variants • Breakthrough COVID-19 cases in vaccinated individuals 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • Advanced communications such as internet and tv promoting wellness and preventative measures • Public health and employment regulations for public and private facilities, producers, etc. • Immunizations & medications • The population density of the rural parts of Wells County is sparse and the rural setting allows for immediate social distancing • Colder climate limits social interactions • Wells County Public Health • St. Aloisius Hospital and Care Center • Part-time clinics in Fessenden and Harvey • Harvey, Fessenden and Bowdon Ambulance Services • Adequate storage space and refrigeration units for stockpile of medical supplies at Wells County Public Health in Fessenden • Wells County is ranked as having a low social vulnerability • N.D. Dept. of Health is statutorily responsible for disease outbreaks – local public health departments work under this direction by way of an MOU
<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • Growing elderly population • Increase in mobility and air travel • Shortage of health professionals in Wells County • Shortage of advanced medical equipment – i.e., ventilators, bipap, bypass, dialysis, air and surface-sterilization • The prevalence of social media increasing skepticism of disease prevention measures • Public schools, daycares, and skilled nursing, assisted living, and group homes • N.D. State Legislature voted in 2021 that the State Health Officer and the Governor cannot implement a mask mandate • Emergence of the COVID-19 variants • Breakthrough COVID-19 cases in vaccinated individuals 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • Advanced communications such as internet and tv promoting wellness and preventative measures • Public health and employment regulations for public and private facilities, producers, etc. • Immunizations & medications • The population density of the rural parts of Wells County is sparse and the rural setting allows for immediate social distancing • Colder climate limits social interactions • Wells County Public Health • St. Aloisius Hospital and Care Center • Part-time clinics in Fessenden and Harvey • Harvey, Fessenden and Bowdon Ambulance Services • Adequate storage space and refrigeration units for stockpile of medical supplies at Wells County Public Health in Fessenden • Wells County is ranked as having a low social vulnerability • N.D. Dept. of Health is statutorily responsible for disease outbreaks – local public health departments work under this direction by way of an MOU 		

Table 4.10.2.5 – Wells County, North Dakota Infectious & Pest Infestations Disease Risk Assessment – Human – CONTINUED

Vulnerability	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • Resistance of the public to mask wearing and following of isolation/quarantine guidelines • Delay of information sharing about disease trends to local public health from state department of health • Delay of information sharing due to local paper only publishing weekly • Lack of local epidemiologist providing specific disease statistics and reporting for Wells County • Lack of indoor drive-through mass vaccinating/testing facility • Lack of backup generators for some emergency services • Lack of consistent information from state leaders • Lack of refrigeration storage in the county courthouse • Infectious disease statistics is not always indicative of community spread as not all cases of disease are reported 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • Wells County Public Health • Regional and state epidemiologists working with local public health to manage disease outbreaks • Regional Public Information Officer (PIO) • Regional Environmental Health Practitioner • Regional Emergency Preparedness and Response Coordinator • Wells County PIO • Wells County has a low Social Vulnerability Index per the CDC as of 2021 • Backup generators for some emergency services
	<p>Capability</p> <ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address infectious disease. 	

Table 4.10.2.6 – Wells County, North Dakota Infectious Disease & Pest Infestations Risk Assessment - Plant

Impact	<ul style="list-style-type: none"> • Crop Loss • Disease Outbreak/Mass Infections (plants only) • Livestock Loss • Loss of Economy • Soil Erosion 	<ul style="list-style-type: none"> • Strain on local, state, and federal governments resources, and private enterprise • Between 2004 and 2022, Wells County recorded 62 cases of Chlamydia, 26 cases of Hepatitis C Chronic, 19 cases of Vancomycin, and 15 cases of West Nile Virus, representing 33.5 percent, 14.1 percent, 10.3 percent, and 8.1 percent of reported infectious diseases, respectively.
Frequency	<ul style="list-style-type: none"> • Crop loss due to infectious disease occurs annually 	<ul style="list-style-type: none"> • On average, crop losses from infectious disease impacts 4,202.86 acres per year resulting in an average of \$260,895.99 in crop losses annually.
Likelihood	<p><u>More Likely</u></p> <ul style="list-style-type: none"> • Agriculture economy • Dependent on weather for animals and crops 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> • Advanced communications such as internet and tv • Public health and employment regulations for public and private facilities, producers, etc. • Pesticide Training facilitated by NDSU Extension/Wells County
Vulnerability	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • Agriculture economy • Dependent on weather for animals and crops 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • Advanced communications such as internet and tv • Public health and employment regulations for public facilities • Pesticide Training facilitated by NDSU Extension/Wells County • Spraying for mosquitos
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address infectious disease. 	

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, humans, 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 unaffected in structural terms. However, critical facilities such as public health, clinics, 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. The age of the drinking/potable water system in incorporated jurisdictions results in numerous water line breaks, which can contribute to higher rates of infectious disease in humans.

Due to the presence of the livestock industry in Wells 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, humans, and plants.

Vulnerabilities to New and Future Development

New development would largely avoid physical impact from infectious disease and pest infestations and not be vulnerable. While mold may make a building uninhabitable, it is not an infectious disease and pest infestations. 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 and pest infestations in animals, humans, and plants.

Population growth or decline, attributable to new and future development, will either increase or decrease the vulnerability to infectious disease and pest infestations. Similarly, population growth in livestock could increase or decrease the vulnerability to infectious disease and pest infestations.

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 (LIP), but the cause of the loss and the number of animals impacted is not available. For plan development purposes, statistics from the LIP program are included in the infectious disease profile.

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 ne manually compiled and analyzed. Statistics on influenza and COVID-19 are shown in separate sections 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)
- Centers for Disease Control Social Vulnerability Index, Wells County, North Dakota
- 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)
- Wells County Local Emergency Operations Plan (LEOP)
- Wells County Continuity of Operations Plan
- Wells County Mass Vaccination Plan through Wells County Public Health
- Wells County Pandemic Influenza Response Plan through Wells County Public Health
- Wells County Point of Dispensing Plan (POD) through Wells County Public Health
- Wells County Mass Care Plan through Wells County Public Health
- Wells County Shelter Plan through Wells County Emergency Management
- Wells County Threat and Hazard Identification and Risk Assessment (THIRA)

DRAFT

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 such as blackouts, and disruptions in high-frequency radios and 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.

Seasonal Pattern	None.
Duration	Minutes. Secondary impacts could last hours, days, weeks, months or even years.
Speed of Onset	Immediate identification from NOAA Space Weather Prediction Center; 8 minutes to reach the Earth.
Location	Total geographic extent of Eddy County and Wells County

For more information regarding space weather please reference the **2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP)**. The plan can be accessed by following the link:

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

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

4.13.1 Space Weather – Eddy County North Dakota

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 across North America and the World provide insight.

- The nearest recorded event affected Montreal, Quebec, Canada on March 13, 1989, when a geomagnetic storm took out the electric power for nine hours impacting 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.

There have been no declared disasters or emergencies pertaining to space weather in Eddy County.

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 indicated 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 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 like tornadoes and hurricanes. The scales rate the severity of possible effects of space weather. The extent/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 Eddy County and its people could be affected.

Risk Assessment

Table 4.13.1.1 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 4, Threat and Hazard Identification Risk Assessment. The total in Table 4.13.1.1 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 4.13.1.1 – Eddy County, North Dakota Space Weather Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Eddy County	4	2	4	4	2	12
City of New Rockford	4	2	4	4	2	12
City of Sheyenne	3	2	4	2	1	10

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

Table 4.13.1.2 provides information on the specific impact, frequency, likelihood, vulnerability, and capability of space weather in Eddy County. A list of impacts identified as commonplace for natural hazards and man-made threats is shown in Chapter 4.

Vulnerabilities to Publicly-Owned Buildings and Property

The physical integrity of publicly-owned buildings and property would not be impacted directly from space weather, but secondary impacts such as loss of electric power or digital/technological 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 Eddy County is provided in Chapter 3, Profile and Inventory.

Vulnerabilities of Critical Facilities and Infrastructure

Critical facilities such as the Eddy County Courthouse, New Rockford Public School, and city halls are vulnerable to space weather in a similar fashion to publicly-owned buildings and property. The Eddy County Courthouse has a specific vulnerability to space weather as prolonged outages of power and data/technological systems could compromise security and endanger the overall functionality of the city of New Rockford and greater Eddy 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.

An inventory of critical facilities and infrastructure is provided in Chapter 3, Profile and Inventory.

Table 4.13.1.2 – Eddy County, North Dakota Space Weather Risk Assessment

<p>Impact</p>	<ul style="list-style-type: none"> • Business Interruptions • Delayed Emergency Response • Explosion • Financial Hardship (Private and Public) • Government Interruptions • HAZMAT Release • Human Injury/Death • Increased Fire Potential • Increased Public Safety Runs • Infrastructure Degradation • Labor Shortages • Loss of Communications • Loss of Economy • Loss/Overcrowded Medical Facilities • Loss/Overcrowded Veterinarian Facilities • Loss of Potable Water 	<ul style="list-style-type: none"> • Loss of Power/Electricity Outage • Loss of Transportation Accessibility • Mass Casualties/Fatalities • Property Damage (Structure, Equipment & Vehicle) • Public Distress/Social Discord • School Closure • Sewer Backup • Sheltering of Displaced Populations • Utility Outage/Shortage • Loss of digital infrastructure at Eddy County Courthouse, New Rockford Public School, city halls, medical facilities, etc.
<p>Frequency</p>	<ul style="list-style-type: none"> • Never a recorded occurrence in Eddy County or North Dakota 	<ul style="list-style-type: none"> • 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.
<p>Likelihood</p>	<ul style="list-style-type: none"> • Dependent on solar activity and the 11-year solar cycle 	<ul style="list-style-type: none"> • Likely to occur once every 500 years per the 2018 N.D. Enhanced Mitigation MAOP
<p>Vulnerability</p>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • Advanced warning and notification such as internet and TV – over-reliance on these systems to support society • Increasing dependency of digital/technological systems in agriculture, private and public sectors • Gas-powered backup generators for critical facilities and infrastructure – the availability of fuel sources may be impacted and/or not available to replenish systems 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • Advanced warning and notification such as internet & TV • Local food production/households with gardens • Gas-powered backup generators for critical facilities and infrastructure
<p>Capability</p>	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address space weather. 	

Vulnerabilities to New and Future Development

As populations grow, more people are at risk of 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 Eddy 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 and Other Key Documents

Power and digital/technological system outages, whether brief or prolonged, occur on a regular basis across North Dakota and Eddy 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.

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
- Eddy County Local Emergency Operations Plan
- Eddy 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)

4.13.2 Space Weather – Wells County, North Dakota

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 across North America and the World provide insight.

- The nearest recorded event affected Montreal, Quebec, Canada on March 13, 1989, when a geomagnetic storm took out the electric power for nine hours impacting 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.

There have been no declared disasters or emergencies pertaining to space weather in Wells County.

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 indicated 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 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 like tornadoes and hurricanes. The scales rate the severity of possible effects of space weather. The extent/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 Wells County and its people could be affected.

Risk Assessment

Table 4.13.2.1 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 4, Threat and Hazard Identification Risk Assessment. The total in Table 4.13.2.1 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 4.13.2.1 – Wells County, North Dakota Space Weather Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Wells County	4	2	4	4	2	12
City of Bowdon	3	2	4	2	1	10
City of Cathay	3	2	4	2	1	10
City of Fessenden	4	2	4	4	2	12
City of Hamberg	3	2	4	2	1	10
City of Harvey	4	2	4	4	2	12
City of Hurdsfield	3	2	4	2	1	10
City of Sykeston	3	2	4	2	1	10

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

Table 4.13.2.2 provides information on the specific impact, frequency, likelihood, vulnerability, and capability of space weather in Wells County. A list of impacts identified as commonplace for natural hazards and man-made threats is shown in Chapter 4.

Vulnerabilities to Publicly-Owned Buildings and Property

The physical integrity of publicly-owned buildings and property would not be impacted directly from space weather, but secondary impacts such as loss of electric power or digital/technological 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 Wells County is provided in Chapter 3, Profile and Inventory.

Vulnerabilities of Critical Facilities and Infrastructure

Critical facilities such as the Wells County Courthouse, Fessenden-Bowdon Public School, Harvey-Wells County Public School, and city halls are vulnerable to space weather in a similar fashion to publicly-owned buildings and property. The Wells County Courthouse has a specific vulnerability to space weather as prolonged outages of power and data/technological systems could compromise security and endanger the overall functionality of the city of Fessenden and Harvey, and greater Wells 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.

An inventory of critical facilities and infrastructure is provided in Chapter 3, Profile and Inventory.

Table 4.13.2.2 – Wells County, North Dakota Space Weather Risk Assessment

<p>Impact</p>	<ul style="list-style-type: none"> • Business Interruptions • Delayed Emergency Response • Explosion • Financial Hardship (Private and Public) • Government Interruptions • HAZMAT Release • Human Injury/Death • Increased Fire Potential • Increased Public Safety Runs • Infrastructure Degradation • Labor Shortages • Loss of Communications • Loss of Economy • Loss/Overcrowded Medical Facilities • Loss/Overcrowded Veterinarian Facilities • Loss of Potable Water 	<ul style="list-style-type: none"> • Loss of Power/Electricity Outage • Loss of Transportation Accessibility • Mass Casualties/Fatalities • Property Damage (Structure, Equipment & Vehicle) • Public Distress/Social Discord • School Closure • Sewer Backup • Sheltering of Displaced Populations • Utility Outage/Shortage • Loss of digital infrastructure at Wells County Courthouse, Fessenden-Bowdon Public School, Harvey-Wells County Public School
<p>Frequency</p>	<ul style="list-style-type: none"> • Never a recorded occurrence in Wells County or North Dakota 	<ul style="list-style-type: none"> • 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.
<p>Likelihood</p>	<ul style="list-style-type: none"> • Dependent on solar activity and the 11-year solar cycle 	<ul style="list-style-type: none"> • Likely to occur once every 500 years per the 2018 N.D. Enhanced Mitigation MAOP
<p>Vulnerability</p>	<p><u>More Vulnerable</u></p> <ul style="list-style-type: none"> • Advanced warning and notification such as internet and TV – over-reliance on these systems to support society • Increasing dependency of digital/technological systems in agriculture, private and public sectors • Gas-powered backup generators for critical facilities and infrastructure – the availability of fuel sources may be impacted and/or not available to replenish systems 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • Advanced warning and notification such as internet & TV • Local food production/households with gardens • Gas-powered backup generators for critical facilities and infrastructure
<p>Capability</p>	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address space weather. 	

Vulnerabilities to New and Future Development

As populations grow, more people are at risk of 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 Wells 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 and Other Key Documents

Power and digital/technological system outages, whether brief or prolonged, occur on a regular basis across North Dakota and Wells 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.

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
- 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)
- Wells County Local Emergency Operations Plan
- Wells County Threat and Hazard Identification and Risk Assessment (THIRA)

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; 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.

Seasonal Pattern	None. Prevalent with the agriculture sector and general vehicular traffic. Incidents in rural areas of the county are more prevalent during severe winter weather/winter conditions.
Duration	Minutes/hours/days/weeks – depending on extent of the incident
Speed of Onset	Little to no warning
Location	Total geographic extent of the Planning Area with a focus on U.S. Highways 52 and 281; N.D. Highways 3, 9, 15, 20, 30 and 200; county and township roads; the Harvey Airport and New Rockford Airport, and boating/recreational traffic on Hoffer Lake. Transportation infrastructure with BNSF Railroad, CP Railway, and RRV&W Railroad No commercial passenger air service.

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>

4.14.1 Transportation Incident

History

Per the profile meeting participants, traffic incidents with minor damage or injuries occur annually in Eddy County and incorporated jurisdictions. Incidents involving cars and farm equipment occur annually. History on transportation incidents in Eddy County was provided by the Eddy County Sheriff's Office, Eddy County Emergency Management, and the N.D. Dept. of Transportation.

Eddy County Sheriff's Office/ Eddy County Emergency Management

List incidents of aircraft, auto, or train here.

N.D. Dept. of Transportation

Table 4.14.1.1 shows crash data provided by the N.D. Dept. of Transportation and is for crashes occurring on state highways in Eddy County between 2005 and 2021. The following are key points from Table 4.14.1.1.

- Between 2005 and 2021, Eddy County experienced 883 total crashes of which 782 were property damage only crashes, 94 were injury crashes resulting in 124 injuries, and seven were fatal crashes resulting in eight fatalities.
- Approximately 88.6 percent of crashes were property-damage only.
- The last fatal crash in Eddy County occurred in 2020.
- According to the Eddy County Sheriff's Office, incidents involving vehicles with wildlife are no longer required to be reported as of 2014 and has resulted in a significant decrease in overall reported incidents in Eddy County.

Probability

The probability of a hazard or threat is how likely it is it will happen. Per the N.D. Dept. of Transportation, Eddy County experiences an average of 46 property-damage only crashes, six injury crashes resulting in eight injuries, and 0.4 fatalities between 2005 and 2021, or approximately 52 crashes annually.

The profile meeting participants indicated the probability of a vehicular transportation incident for Eddy County is highly likely, meaning that there is a 100 percent probability in the next year of an incident. Transportation incidents involving aircraft, agricultural-related equipment, and pedestrian/other modes of transportation are occasional.

Table 4.14.1.1 – 2005 to 2021 Eddy County, North Dakota Crash Summary

Year	Property Damage Only (PDO)	Injury Crashes	Total Injuries	Fatal Crashes	Total Fatalities	Total Crashes
2005	89	5	NA	0	NA	94
2006	49	6	11	0	0	55
2007	88	4	8	1	1	93
2008	67	3	4	1	1	71
2009	65	6	10	0	0	71
2010	89	7	11	0	0	96
2011	82	8	19	1	1	91
2012	75	10	16	1	2	86
2013	27	5	6	0	0	32
2014	17	7	10	1	1	25
2015	9	5	5	0	0	14
2016	26	6	8	0	0	32
2017	28	7	0	0	0	35
2018	23	3	3	1	1	27
2019	23	5	6	0	0	28
2020	14	3	3	1	1	18
2021	11	4	4	0	0	15
TOTAL	782	94	124	7	8	883

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

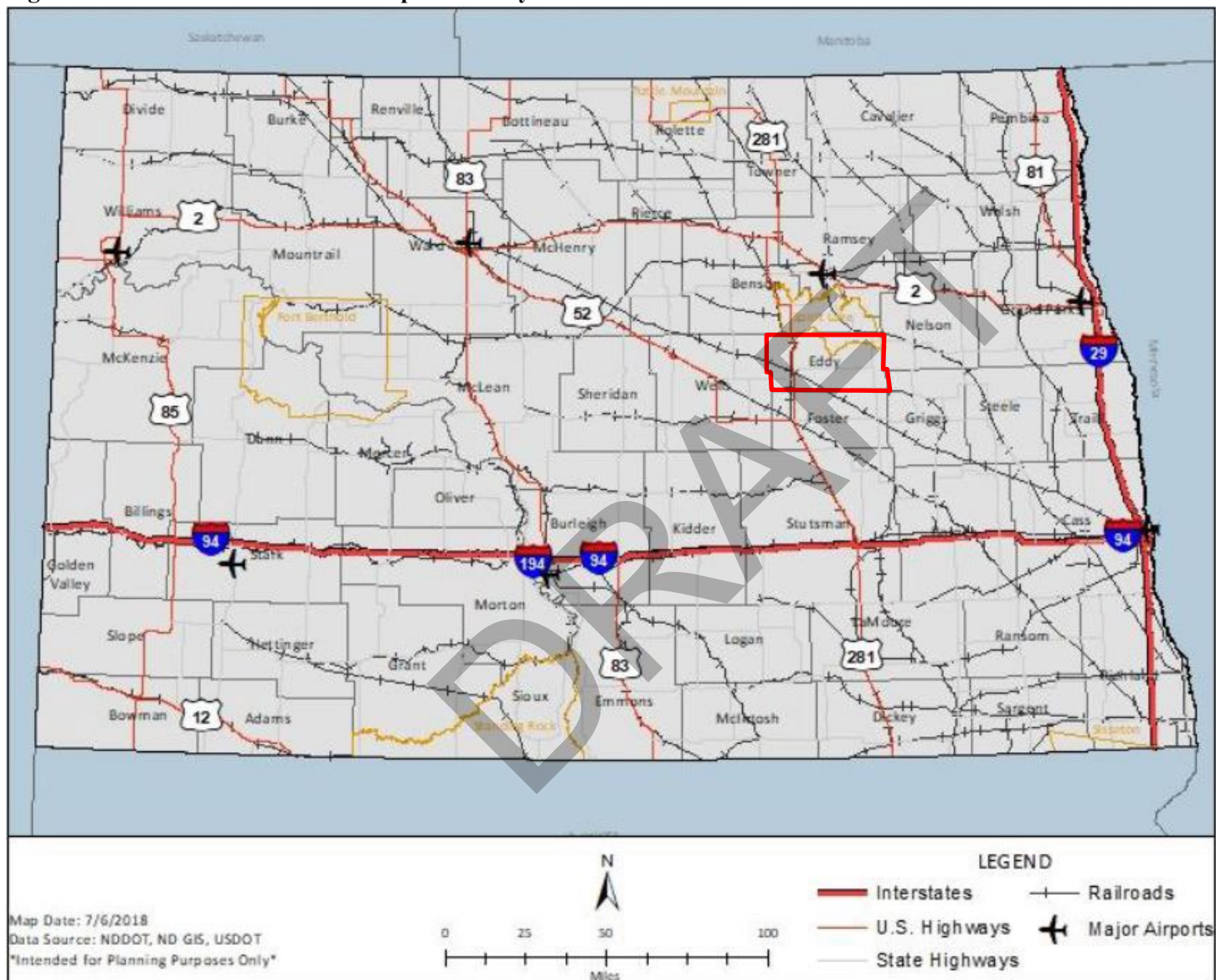
Extent/Magnitude

The extent/magnitude of a hazard or threat is the expressed in the amount of damage or losses either caused or could occur in a community. Meeting participants at the profile meeting indicated the extent/magnitude of a transportation incident for Eddy County would be critical, meaning an incident would result in noticeable damage to people, buildings, and property. According to the 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP), Eddy County has a moderate to transportation incidents based on analysis of its transportation infrastructure; the county does not have a commercial passenger airport or interstate, but has two U.S. Highway, state highways, and robust 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. Eddy County was not among the top 10 counties with estimated injury and fatality costs for motor vehicle crashes in 2016.

Figure 4.14.1.1 illustrates transportation system in North Dakota.

Figure 4.14.1.1 – North Dakota Transportation System



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

Risk Assessment

Table 4.14.1.2 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 4.14.1.2 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 4.14.1.2 – Eddy County, North Dakota Transportation Incident Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Eddy County	4	3	3	3	1	12
City of New Rockford	3	3	3	3	1	11
City of Sheyenne	3	3	3	3	1	11
City of McClusky	4	3	3	3	1	12

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

Table 4.14.1.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of transportation incident in Eddy 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

Publicly-owned buildings and property should not be affected by transportation incidents except in an instance where an airplane or vehicle crash impacts a building or property. However, any truck incident involving hazardous materials 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 Eddy County Courthouse, public schools, and buildings supporting emergency services such as ambulance halls and fire stations. 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.

What buildings and property are proximate to transportation??

A summary of city and county-owned buildings and property in Eddy County is provided in Chapter 3, Profile and Inventory.

Table 4.14.1.3 – Eddy County, North Dakota Transportation Incident Risk Assessment

Impact	<ul style="list-style-type: none"> • Blocked roads from incidents, and severe weather, and at-grade railroad crossing with roads and highways • Explosion • HAZMAT Release • Human Injury/Death / Mass Casualties/Fatalities • Increased Fire Potential • Increased Public Safety Runs • Loss of Transportation/Accessibility 	<ul style="list-style-type: none"> • 124 injuries and eight fatalities from vehicular crashes between 2005 and 2021 • Decrease in regional economic activity if impacting a major transportation artery for an extended period such as N.D. Highways 9, 15, 20 and 20; N.D. Highway 14, and U.S. Highways 52 & 281
Frequency	<ul style="list-style-type: none"> • Annual occurrences of car crashes, truck-related incidents, etc. • Incidents of significance involving cars, trucks, and large vehicles occurs every 3 to 5 years 	<ul style="list-style-type: none"> • Eddy County experiences an average of 46 property-damage only crashes, six injury crashes resulting in eight injuries, and 0.4 fatalities between 2005 and 2021, or approximately 52 crashes annually.
Likelihood	<p><u>More Likely</u></p> <ul style="list-style-type: none"> • U.S. Highways 52 and 281; N.D. Highways 15, 20, and 200; and boating/recreational traffic on.... • High truck traffic with chemicals, fuel, and farm and agriculture related industries on all state and federal highways 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> • Lack of an interstate • Lack of commercial passenger air service • Road improvement projects? List here.
Vulnerability	<p><u>More Likely</u></p> <ul style="list-style-type: none"> • U.S. Highways 52 and 281; N.D. Highways 15, 20, and 200; and boating/recreational traffic on.... • High truck traffic with chemicals, fuel, and farm and agriculture related industries on all state and federal highways 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> • Lack of an interstate • Lack of commercial passenger air service • Road improvement projects? List here.
Capability	<ul style="list-style-type: none"> • See Chapter 7 for a list of capabilities to address transportation incident. 	

Vulnerabilities of Critical Facilities and Infrastructure

Critical facilities such as the Eddy County Courthouse, Lutheran Home – Good Shepherd, ambulance and fire halls in New Rockford and Sheyenne, and infrastructure such as water/wastewater treatment facilities and power grid infrastructure should not be affected by transportation incidents, except in rare occurrences if an incident physically impacts these facilities and/or infrastructure, or personnel employed therein are impacted by an incident.

Medical. A transportation incident involving significant injuries or fatalities can result in overcrowding and/or a shortage of medical supplies at the Lutheran Home – Good Shepherd or medical clinics in the city of New Rockford.

Power. 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 the Eddy County Courthouse or infrastructure such as lift stations or water treatment plants. According to meeting participants, electric service providers have substations located throughout the county.

Railroad. There are no vulnerabilities to critical facilities and infrastructure from transportation incidents involving trains near the cities of Goodrich and McClusky as the railroad was decommissioned in the 1980s. **There are no critical facilities or infrastructure identified near CP Railway in the extreme northeast and northwest corners of Eddy County.**

Road. 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 U.S. Highways 52 and 281, and N.D. Highways 9, 15, 20, and 200, 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.

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 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 and Other Key Documents

Incidents involving vehicles with wildlife are no longer required to be reported as of 2014 and has resulted in a significant decrease in overall reported incidents across North Dakota.

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 N.D. Highway Safety Plan

- 2020 N.D. Dept. of Transportation Urban High Crash Locations Report
- Eddy County Comprehensive Plan
- Eddy County Zoning Ordinance
- Eddy County Local Emergency Operations Plan (LEOP)
- Eddy County Threat and Hazard Identification and Risk Assessment (THIRA)
- 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

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4.14.2 Transportation Incident

History

Per the profile meeting participants, traffic incidents with minor damage or injuries occur annually in Wells County and incorporated jurisdictions. Incidents involving cars and farm equipment occur annually. History on transportation incidents in Wells County was provided by the Wells County Sheriff's Office, Wells County Emergency Management, and the N.D. Dept. of Transportation.

Wells County Sheriff's Office/ Wells County Emergency Management

List incidents of aircraft, auto, or train here.

N.D. Dept. of Transportation

Table 4.14.2.1 shows crash data provided by the N.D. Dept. of Transportation and is for crashes occurring on state highways in Wells County between 2005 and 2021. The following are key points from Table 4.14.2.1.

- Between 2005 and 2021, Wells County experienced 1,688 total crashes of which 1,434 were property damage only crashes, 242 were injury crashes resulting in 312 injuries, and 12 were fatal crashes resulting in 13 fatalities.
- Approximately 85.0 percent of crashes were property-damage only.
- The last fatal crash in Wells County occurred in 2020.
- According to the Wells County Sheriff's Office, incidents involving vehicles with wildlife are no longer required to be reported as of 2014 and has resulted in a significant decrease in overall reported incidents in Wells County.

Probability

The probability of a hazard or threat is how likely it is it will happen. Per the N.D. Dept. of Transportation, Wells County experiences an average of 84 property-damage only crashes, 14 injury crashes resulting in 20 injuries, and 0.8 fatalities between 2005 and 2021, or approximately 99 crashes annually.

The profile meeting participants indicated the probability of a vehicular transportation incident for Wells County is highly likely, meaning that there is a 100 percent probability in the next year of an incident. Transportation incidents involving aircraft, agricultural-related equipment, and pedestrian/other modes of transportation are occasional.

Table 4.14.2.1 – 2005 to 2021 Wells County, North Dakota Crash Summary

Year	Property Damage Only (PDO)	Injury Crashes	Total Injuries	Fatal Crashes	Total Fatalities	Total Crashes
2005	131	13	NA	1	NA	145
2006	134	12	15	1	1	147
2007	165	17	23	0	0	182
2008	135	13	17	1	1	149
2009	118	13	21	4	4	135
2010	126	21	33	0	0	147
2011	133	23	34	1	3	157
2012	124	20	27	2	2	146
2013	120	18	22	0	0	138
2014	58	16	22	0	0	74
2015	50	16	25	0	0	66
2016	39	8	15	0	0	47
2017	25	8	8	1	1	34
2018	38	14	15	0	0	52
2019	11	6	7	0	0	17
2020	16	10	13	1	1	27
2021	11	14	15	0	0	25
TOTAL	1,434	242	312	12	13	1,688

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

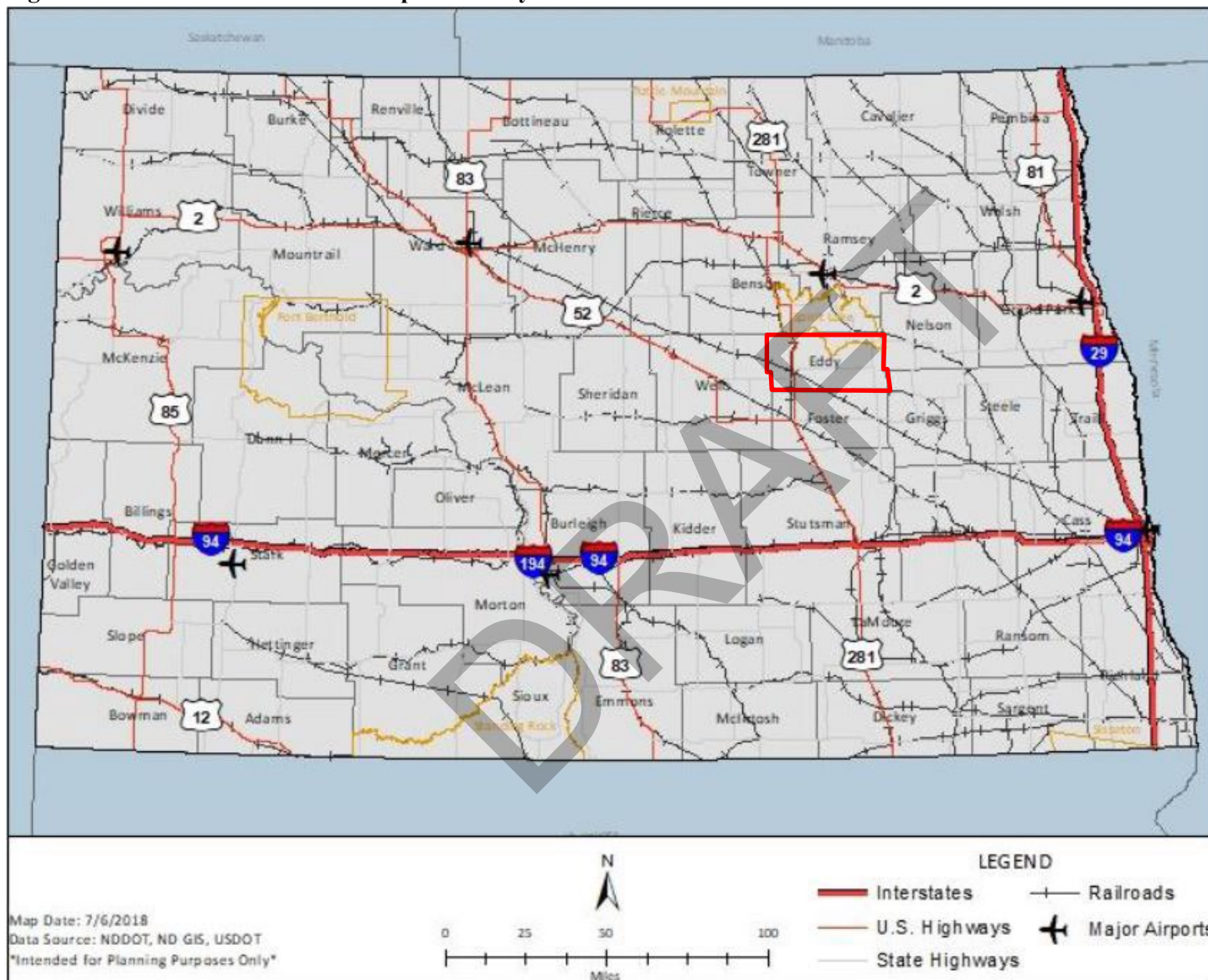
Extent/Magnitude

The extent/magnitude of a hazard or threat is the expressed in the amount of damage or losses either caused or could occur in a community. Meeting participants at the profile meeting indicated the extent/magnitude of a transportation incident for Wells County would be critical, meaning an incident would result in noticeable damage to people, buildings, and property. According to the 2018 N.D. Enhanced Mitigation Mission Area Operations Plan (MAOP), Wells County has a moderate to transportation incidents based on analysis of its transportation infrastructure; the county does not have a commercial passenger airport or interstate, but has U.S. Highway 52, state highways, and robust 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. Wells County was not among the top 10 counties with estimated injury and fatality costs for motor vehicle crashes in 2016.

Figure 4.14.2.1 illustrates transportation system in North Dakota.

Figure 4.14.2.1 – North Dakota Transportation System



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

Risk Assessment

Table 4.14.2.2 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 4.14.2.2 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 4.14.2.2 – Wells County, North Dakota Transportation Incident Risk Assessment Scored Chart Summary

Jurisdiction	Impact	Frequency	Likelihood	Vulnerability	Capabilities	Total
Wells County	4	4	4	4	1	15
City of Bowdon	2	2	2	2	1	7
City of Cathay	2	2	2	2	1	7
City of Fessenden	3	3	3	3	1	11
City of Hamberg	2	2	2	2	1	7
City of Harvey	3	3	3	3	1	11
City of Hurdsfield	2	2	2	2	1	7
City of Sykeston	3	2	3	3	1	10

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

Table 4.14.2.3 provides information on the specific impact, frequency, likelihood, vulnerability and capability of transportation incident in Wells 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

Publicly-owned buildings and property should not be affected by transportation incidents except in an instance where an airplane or vehicle crash impacts a building or property. However, any truck incident involving hazardous materials 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 Wells County Courthouse, public schools, and buildings supporting emergency services such as ambulance halls and fire stations. 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.

What buildings and property are proximate to transportation??

A summary of city and county-owned buildings and property in Wells County is provided in Chapter 3, Profile and Inventory.

Table 4.14.2.3 – Wells County, North Dakota Transportation Incident Risk Assessment

Impact	<ul style="list-style-type: none"> Blocked roads from incidents, and severe weather, and at-grade railroad crossing with roads and highways Explosion HAZMAT Release Human Injury/Death / Mass Casualties/Fatalities Increased Fire Potential Increased Public Safety Runs Loss of Transportation/Accessibility 	<ul style="list-style-type: none"> 312 injuries and 12 fatalities from vehicular crashes between 2005 and 2021 Decrease in regional economic activity if impacting a major transportation artery for an extended period such as N.D. Highways 3, 15, 30 and 200; and U.S. Highway 52
Frequency	<ul style="list-style-type: none"> Annual occurrences of car crashes, truck-related incidents, etc. Incidents of significance involving cars, trucks, and large vehicles occurs every 3 to 5 years 	<ul style="list-style-type: none"> Wells County experiences an average of 84 property-damage only crashes, 14 injury crashes resulting in 20 injuries, and 0.8 fatalities between 2005 and 2021, or approximately 99 crashes annually.
Likelihood	<p><u>More Likely</u></p> <ul style="list-style-type: none"> U.S. Highway 52; N.D. Highways 3, 15, 30, and 200; and boating/recreational traffic on... High truck traffic with chemicals, fuel, and farm and agriculture related industries on all state and federal highways 	<p><u>Less Likely</u></p> <ul style="list-style-type: none"> Lack of an interstate Lack of commercial passenger air service Road improvement projects? List here.
Vulnerability	<p><u>More Likely</u></p> <ul style="list-style-type: none"> U.S. Highway 52; N.D. Highways 3, 15, 30, and 200; and boating/recreational traffic on... High truck traffic with chemicals, fuel, and farm and agriculture related industries on all state and federal highways Two lane highways and roads with narrow shoulders and poorly marked intersections 	<p><u>Less Vulnerable</u></p> <ul style="list-style-type: none"> Lack of an interstate Lack of commercial passenger air service Road improvement projects? List here. Passing lanes, intersections and signage upgrades made
Capability	<ul style="list-style-type: none"> See Chapter 7 for a list of capabilities to address transportation incident. 	

Vulnerabilities of Critical Facilities and Infrastructure

Critical facilities such as the Wells County Courthouse, St. Aloisius Hospital & Medical Center, ambulance and fire halls in Bowdon, Fessenden and Harvey, and infrastructure such as water/wastewater treatment facilities and power grid infrastructure should not be affected by transportation incidents, except in rare occurrences if an incident physically impacts these facilities and/or infrastructure, or personnel employed therein are impacted by an incident.

Medical. A transportation incident involving significant injuries or fatalities can result in overcrowding and/or a shortage of medical supplies at the St. Aloisius Hospital & Medical Center or medical clinics in the city of Harvey

Power. 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 the Wells County Courthouse or infrastructure such as lift stations or water treatment plants. According to meeting participants, electric service providers have substations are located throughout the county.

Railroad. What is vulnerable????

Road. 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 U.S. Highway 52 and N.D. Highways 3, 20, and 200, 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.

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 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 and Other Key Documents

Incidents involving vehicles with wildlife are no longer required to be reported as of 2014 and has resulted in a significant decrease in overall reported incidents across North Dakota.

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 N.D. Highway Safety Plan
- 2020 N.D. Dept. of Transportation Urban High Crash Locations Report
- 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
- Wells County Comprehensive Plan
- Wells County Zoning Ordinance
- Wells County Local Emergency Operations Plan (LEOP)
- Wells County Threat and Hazard Identification and Risk Assessment (THIRA)

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5. Future Conditions (Climate Change)

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 2023 Eddy & Wells Counties, ND 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

National Oceanic and Atmospheric Administration (NOAA)

According to the U.S. Dept. of Commerce, National Oceanic Atmospheric Administration, Earth System Research Laboratory, Physical Sciences Division, current science calculations estimate an approximately 3.6°C increase in temperature for the Grant County area, which does not adversely affect crops, livestock, or other economic drivers.

Anticipated Future Impacts of Natural Hazards and Man-Made Threats

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.

According to the Baseline Climate Change Assessment for North Dakota from the 2023 N.D. Enhanced Mitigation Mission Area Operations Plan, some research links the effects of climate change to an increasing intensity in civil disturbances.

- **Criminal, Terrorist, or Nation-State Attack.** According to the Baseline Climate Change Assessment for North Dakota from the 2023 N.D. Enhanced Mitigation Mission Area Operations Plan, warming winter temperatures will lead to more freezing grain which can impact energy transmission, communications, and the transportation of hazardous materials.
- **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.

According to the Baseline Climate Change Assessment for North Dakota from the 2023 N.D. Enhanced Mitigation Mission Area Operations Plan, droughts are projected to increase in frequency and duration.

- **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.

According to the Baseline Climate Change Assessment for North Dakota from the 2023 N.D. Enhanced Mitigation Mission Area Operations Plan, droughts are projected to increase in frequency and duration. Increases in temperatures and frequency of droughts translates into an increase in the frequency of wildland fires.

- **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.

According to the Baseline Climate Change Assessment for North Dakota from the 2023 N.D. Enhanced Mitigation Mission Area Operations Plan, doubling the amount of greenhouse gases will lead to greater available energy for thunderstorm development. Heavy to extreme precipitation events are projected to increase the frequency of flood events, especially in the eastern portion of the state.

- **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.

According to the Baseline Climate Change Assessment for North Dakota from the 2023 N.D. Enhanced Mitigation Mission Area Operations Plan, doubling the amount of greenhouse gases will lead to greater available energy for thunderstorm development. More intense storms could contribute to an increased frequency of soil erosion and landslides.

- **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.

According to the Baseline Climate Change Assessment for North Dakota from the 2023 N.D. Enhanced Mitigation Mission Area Operations Plan, as a result of warming winters, more pests and invasive weeds will be able to survive the winter season, contributing to increases in insect populations.

- **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.

According to the Baseline Climate Change Assessment for North Dakota from the 2023 N.D. Enhanced Mitigation Mission Area Operations Plan, doubling the amount of greenhouse gases will lead to greater available energy for thunderstorm development. Increases in heavy precipitation could jeopardize the integrity of the aging dams in North Dakota.

- **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 anticipated 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.

6.2 Eddy County, North Dakota Mitigation Strategy

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. 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.

Eddy County

Eddy County can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. Flooding causes annual damage to property due to the presence of high-water tables, inadequate drainage, closed basins, and the source of the Sheyenne River located in neighboring Wells County. Economic loss to the agriculture and livestock industry occurs on a frequency basis. Critical facilities in the county and incorporated jurisdictions need generators for backup power and upgraded emergency alerting. The county needs to retrofit existing or construct new storm shelters. The county has planning and regulatory, administrative and technical, education and outreach, financial, and planning and regulatory capabilities to accomplish mitigation. However, these capabilities need to be improved and expanded. The county relies on outside sources for funding and to accomplish large-scale mitigation projects.

Improvement and expansion of mitigation capabilities; upgrading of sirens, equipment, and installation of generators; construction of flood control measures; and upgrading of critical facilities and infrastructure are a priority for the county.

Eddy County Project AT-1: Strengthen and Expand Administrative and Technical Mitigation Capabilities.

Description/Benefit		Expand administrative and technical mitigation capabilities to improve county readiness and preparedness. <u>Administration:</u> Update mutual aid agreements on a continuous basis. Special attention should be paid to public schools. Convert verbal to written. <u>Staff:</u> Conduct Floodplain Administrator and Planning and Zoning education in Eddy County. Research options for relinquishing incorporated jurisdiction (township) and unincorporated communities’ administration to Eddy County. Educate staff to enforce building codes. Support and continue development of GIS coordinator position. <u>Technical</u> <ul style="list-style-type: none"> • Install solar-powered electronic fire index signs – See Eddy County Project AT-4 • Install permanent generators – See Eddy County Project AT-5 • Install and/or expand directional signage for emergency services and for truck/hazmat routes wherever missing or needed – ordinances may be necessary. Some incorporated cities need truck route signage expansion and/or upgrade. South-facing signs become sun-bleached and need replacement often. • Install faraday cages/shields at digital/technological infrastructure systems at critical facilities and infrastructure • Install enhanced cybersecurity countermeasures (i.e., PA Traps/malware, multi-factor authentication, etc.) - specific attention should be paid to the recommendations made in N.D. Cybersecurity Maturity Assessment. 					
Hazard/Threat		All (Space Weather)					
Affected Jurisdictions		Eddy County and Incorporated Jurisdictions					
Project Status		Ongoing and Continue/New					
Priority		High					
Responsible Agency		County Commission, City Council(s), Emergency Services, NDIS, Public Schools, Public Works, Public Utilities					
Partners		Emergency Management, Extension, Planning & Zoning					
Completion Timeframe		Ongoing	Cost	Project-specific			
Funding Source		Local budgets. State and federal grants. FEMA. Public Utilities. Regional Council. RD. USFS.					
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	4	5	3	4	30
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Eddy County LEOP & Mitigation Plan Eddy County THIRA		Capability Assessment, Hazard History, Risk Assessment			Solicit project scope of work. Pursue grant funding or use local funds.		

Eddy County Project AT-2: Expand and Enforce Building Codes.

Description/Benefit	Improve administrative and technical, and planning and regulatory capabilities through establishment of a building code enforcement contract from an outside source, establishment of a county position or education of existing county departments, to enforcement of building codes. Building codes can be enforced to increase structural integrity of new structures or renovation of existing.		
Hazards Addressed	All Hazards and Threats		
Affected Jurisdiction(s)	Eddy County and Incorporated Jurisdictions		
Project Status	Ongoing and Continue		
Priority	Medium		
Responsible Agency	City Councils, County Commission, Planning & Zoning		
Partners	Emergency Services, NDDH, Public Health, Township Boards		
Completion Timeframe	Ongoing	Cost	Project-specific
Funding Source	Local, state, federal grants. City Councils. County Commission.		

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	3	2	4	3	5	26

Integration of Mitigation Plan Requirements into Local Planning Mechanisms

<u>Planning Mechanisms Utilized</u>	<u>Plan Element</u>	<u>Process for Integration</u>
Planning and Zoning Eddy County LEOP & Mitigation Plan Eddy County THIRA	Capability Assessment, Hazard History, Risk Assessment	Approval by county commission, city councils or township board

Eddy County Project AT-3: Upgrade and/or Expand Emergency Alerting/Communications and/or Outdoor Early Warning System(s).

Description/Benefit		Coverage of current outdoor early warning system/sirens does not provide coverage to an adequate geographic expanse of the county. Upgrade existing manually-activated sirens to dispatch-activated sirens. Install new dispatch-activated sirens where necessary. There are no existing outdoor early warning sirens for the county outside incorporated cities. Purchase NOAA weather radios for rural communities. <u>Upgraded: City of Sheyenne in 2016</u> Purchase NOAA weather radios for rural populations and unincorporated communities.					
Hazard/Threat Addressed		Flood, Hazardous Material Release, Severe Summer Weather, Fire (Wildland)					
Affected Jurisdiction(s)		City of Sheyenne					
Project Status		Ongoing and Continue					
Priority		High					
Responsible Agency		City Council(s), Emergency Management, Emergency Services					
Partners		County Commission, BOR, FEMA, NDDDES, NWS, Public Works					
Completion Timeframe		Ongoing	Cost	Siren: Up to \$30,000 per siren			
Funding Source		Local budgets. 9-1-1 funding. State Homeland Security Grant Program. FEMA.					
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	5	4	5	34
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Eddy County LEOP Eddy County Mitigation Plan Eddy County THIRA		Capability Assessment, Hazard History, Risk Assessment			Develop specifications. Received EHP approval. Pursue grant funding. Approval by county commission/City Council(s).		

Eddy County Project AT-4: Install Digital Fire Index Signage at Strategic Points in Eddy County.

Description/Benefit		<p>Improve public awareness and education of North Dakota Fire Danger index through installation of fire index signs. The fire danger index from the state provides an indication of rural fire potential for grasslands, and its ability to spread.</p> <p>Upgrade: Manual fire index sign to a digital sign at New Rockford City Hall</p> <p>New Digital Signs: City of Sheyenne, Intersection of U.S. Highway 281 and N.D. Highway 15 in Eddy County outside New Rockford city limits</p>					
Hazards Addressed		Hazardous Material Release, Severe Summer Weather, Fire (Urban & Wildland)					
Affected Jurisdiction(s)		Eddy County and Incorporated Jurisdictions					
Project Status		Ongoing and Continue					
Priority		Medium					
Responsible Agency		Emergency Management, Emergency Services					
Partners		County Commission, Public Works NDDOT, NWS, Media USFS					
Completion Timeframe		2 to 3 years	Cost	\$15,000 to \$30,000 per sign			
Funding Source		Local, state, federal grants. USFS.					
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	3	4	31
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Eddy County LEOP Eddy County Mitigation Plan Eddy County THIRA		Capability Assessment, Hazard History, Risk Assessment			Approval by county commission and city councils		

Eddy County Project AT-5: Install New 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:</p> <p><u>Upgrade</u></p> <ul style="list-style-type: none"> • Eddy County Courthouse • Eddy County Shops • Lutheran Home of the Good Shepherd <p><u>Install new</u></p> <ul style="list-style-type: none"> • City of New Rockford: Brown Memorial, city hall, city shop, Heritage House • City of Sheyenne: Ostby Hall (to establish storm shelter) and fire hall. Lift station was installed in 2019. <p>Additional redundancies in power grid systems are a high priority.</p>						
Hazard/Threat Addressed	All Hazard/Threats						
Affected Jurisdiction(s)	Eddy County and Incorporated Jurisdictions						
Project Status	Ongoing and Continue						
Priority	Very High						
Responsible Agency	County Commission, City Council(s), Emergency Management, Emergency Services						
Partners	Medical Services Providers, Public Works, Public Utilities						
Completion Timeframe	Ongoing	Cost	Project-specific				
Funding Source	Public Utilities. Regional Council. RD. USDA. FEMA’s Building Resilient Infrastructure and Communities (BRIC) Grant Program. State Homeland Security Grant Program. State Surplus.						
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	4	4	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>		
Eddy County LEOP & Mitigation Plan Eddy County THIRA		Capability Assessment, Hazard History, Risk Assessment			Procure scope of work for project. Received EHP Approval. Apply for grant funding.		

Eddy County Project AT-6: Upgrade Existing/Purchase New Equipment & Infrastructure for Emergency Services & Incorporated Jurisdictions.

Description/Benefit		Purchase and/or install upgraded equipment for ambulance, fire, law enforcement, medical facilities and special units. Improve administrative and technical capabilities of emergency services to mitigate the impact of hazards.					
		<p>Community Ambulance Services-New Rockford (CASNR): Pagers, portable radios, casualty trailer supplies</p> <p>Eddy County Sheriff's Office:</p> <p>New Rockford Volunteer Fire Department: Bunker gear, fire hall, SIRN 2020 radios</p> <p>New Rockford Rural Volunteer Fire Department: Water tender equipment, SIRN 2020 radios</p> <p>Sheyenne Volunteer Fire Department: SIRN 2020 radios, SCBAs, bunker gear, ATV for wildland fires</p> <p>Eddy County: Road barricades to block roads impacted by inclement weather, large track hoe for maintaining, draining ditches, snow blowers for county road graders.</p> <p>New Rockford: Road barricades to block roads impacted by inclement weather, large track hoe for maintaining, draining ditches, snow blowers for city equipment.</p> <p>Sheyenne: Purchase a 3-yard pay loader with six-way blade and snow blower.</p>					
Hazard/Threat Addressed		All Hazard /Threats					
Affected Jurisdiction(s)		Eddy County and Incorporated Jurisdictions					
Project Status		Ongoing and Continue					
Priority		High					
Responsible Agency		City Council(s), Emergency Management, Emergency Services					
Partners		County Commission, Engineering					
Completion Timeframe		Ongoing			Cost	Project-specific	
Funding Source		Local budgets. State and federal grants. CDBG, Emergency Services, FEMA, HUD, Public Utilities, RD.					
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	5	4	5	34
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>			<u>Plan Element</u>			<u>Process for Integration</u>	
Eddy County LEOP Eddy County Mitigation Plan Eddy 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).	

Eddy County Project AT-7: Encourage Fire Departments to Digitize Incident History.

Description/Benefit	The fire departments based in and serving Eddy County maintain paper copies of incident history. Hardcopies are at risk of damage from fire and other miscellaneous hazards at the fire hall. Analysis of incident history is challenging at best with paper files. In addition, grant writing and funding requests are streamlined						
Hazard/Threat Addressed	Fire (Urban and Wildland), HAZMAT						
Affected Jurisdiction(s)	Eddy County and Incorporated Jurisdictions						
Project Status	Ongoing and Continue						
Priority	High						
Responsible Agency	Emergency Services						
Partners	Emergency Management						
Completion Timeframe	1 year			Cost	Staff-time only		
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
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Eddy County LEOP Eddy County Mitigation Plan Eddy County THIRA		Capability Assessment, Hazard History, Risk Assessment			Identify fire department personnel capable of digitizing records. Select preferred digital method (excel, specified program or software).		

Eddy County Project AT-8: Establish Permanent Maintenance System for Storm Water Systems/Drainage Ditches to Reduce and/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. The county road department and city public works departments already has a schedule for maintaining storm water systems/drainage ditches but needs to be converted to a written document for continuity purposes.						
Hazard/Threat Addressed	Drought, Flood (Overland), Infectious Disease, Severe Summer Weather, Severe Winter Weather, Wildland Fire						
Affected Jurisdiction(s)	Eddy County and Incorporated Jurisdictions						
Project Status	Ongoing and Continue						
Priority	High						
Responsible Agency	County Commission, City Council(s), Public Works						
Partners	Emergency Management, Emergency Services, DWR, NRCS, Public Health, Water Resource District						
Completion Timeframe	End of 2023	Cost	Staff-time				
Funding Source	Local 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
5	5	4	4	4	5	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>		
Eddy County LEOP Eddy County Mitigation Plan Eddy County THIRA		Capability Assessment, Hazard History, Risk Assessment			Development of system by county public works. Approval and adoption by county commission and water resource district board. Include as annex in local emergency operations plan.		

Eddy County Project AT-9: Establish a “Safe Send” Site/Drop-Off Point for Disposal of Hazardous Materials.

Description/Benefit	<p>Surplus hazardous materials need to be disposed of properly to mitigate the release of hazardous materials and subsequent fires or infectious diseases.</p> <p>Eddy County should work with a surrounding municipal landfill to include procedures for disposal in the county’s hazardous materials response plan. Specific attention should be paid to the waterway east of the landfill to ensure no contamination occurs.</p> <p>A “Safe Send” site is available for fungicides, herbicides, and pesticides through the N.D. Dept. of Agriculture. There are multiple sites throughout the state.</p>		
Hazard/Threat Addressed	Drought, Fire, Hazardous Material Release, Infectious Disease (All)		
Affected Jurisdiction(s)	Eddy County and Incorporated Jurisdictions		
Project Status	New/Ongoing and Continue		
Priority	High		
Responsible Agency	County Commission, City Council(s), Public Works		
Partners	Emergency Management, Emergency Services, NRCS, SWC, Water Resource District		
Completion Timeframe	End of 2023	Cost	Staff-time
Funding Source	Local budgets. Research local fee structure to address disposal costs.		

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	3	3	5	5	5	31

Integration of Mitigation Plan Requirements into Local Planning Mechanisms

<u>Planning Mechanisms Utilized</u>	<u>Plan Element Utilized</u>	<u>Process for Integration</u>
Eddy County LEOP Eddy County Mitigation Plan Eddy County THIRA	Capability Assessment, Hazard History, Risk Assessment	Work with local emergency services to identify development of site.

Eddy County Project AT-10: Install Homeland Security Measures at Critical Facilities and Infrastructure.

Description/Benefit		<p>The Eddy County Courthouse, emergency services buildings, and public schools are critical facilities, and utility and transportation infrastructure are vulnerable to adversarial threats. Installation of (but not limited to) access control measures, alarms, cybersecurity enhancements, door alarms, door locks, enhanced lighting, security fencing, motion-detecting systems, security camera surveillance systems, and threat-proof building materials are needed to mitigate adversarial threats.</p> <ul style="list-style-type: none"> • Access Control Systems (Bollards): Eddy County Courthouse (back doors), Lutheran Home of Good Shepherd, New Rockford City Hall/Fire Hall, front door of New Rockford-Sheyenne Public School • Alarm Systems: Lake Region District Health, Eddy County Social Services • Door Access Control Systems: New Rockford City Hall/Fire Hall, New Rockford City Shop, Sheyenne Fire Hall, county shops in Sheyenne and Hamar. • Security Camera Surveillance Systems: New Rockford Water Treatment Plant, Eddy County Courthouse, Lake Region District Health, Central Prairie Social Services • Security Fencing: New Rockford Water Treatment Plant, around the New Rockford-Sheyenne Public School • Security Lighting: Eddy County Courthouse (exterior), New Rockford-Sheyenne Public School • Threat-Proof Doors and Windows: New Rockford-Sheyenne Public School 					
Hazard/Threat Addressed		Civil Disturbance; Criminal, Terrorist, or Nation/State Attack, Fire (Urban), Transportation Incident (all)					
Affected Jurisdiction(s)		Eddy County and Incorporated Jurisdictions					
Project Status		New					
Priority		Very High					
Responsible Agency		County Commission, City Council(s), Emergency Management, Emergency Services, Public Works, Medical Service Providers					
Partners		Dept. Homeland Security, NDDDES, private contractors					
Completion Timeframe		Ongoing		Cost	Project-specific		
Funding Source		Local budgets and department staff and resources. State Homeland Security Grants. FEMA. RD. USDA.					
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	3	4	31
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Eddy County LEOP & Mitigation Plan Eddy County THIRA		Capability Assessment, Hazard History, Risk Assessment			Develop scope of work and procure bids/quotes. Apply for grant funding. Select contractor. Receive EHP approval. Execute.		

Eddy County Project AT-11: Support the N.D. Dept. of Water Resources Risk Mapping, Analysis, and Planning (RISK MAP).

Description/Benefit		The N.D. Dept. of Water Resources received funding from the Federal Emergency Management Agency (FEMA) to produce new and/or update flood maps for Eddy County and incorporated jurisdictions. Workshops began Fall 2017.					
		Lack of participation will result in no opportunity to map unmapped areas or share risk knowledge and update existing maps.					
Hazard/Threat Addressed		Drought, Flood (Overland), Infectious Disease, Severe Summer Weather, Severe Winter Weather					
Affected Jurisdiction(s)		Eddy County and Incorporated Jurisdictions					
Project Status		New					
Priority		Very High					
Responsible Agency		DWR					
Partners		County Commission, City Council(s), Emergency Management, Emergency Services					
Completion Timeframe		End of 2025	Cost	Staff-time			
Funding Source		FEMA					
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	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>			<u>Plan Element Utilized</u>			<u>Process for Integration</u>	
Eddy County LEOP Eddy County Mitigation Plan Eddy County THIRA			Capability Assessment, Hazard History, Risk Assessment			Follow direction from the N.D. Dept. of Water Resources	

Eddy County Project EO-1: Conduct Education and Outreach to Improve Household Disaster Readiness and Preparedness.

Description/Benefit		Continued education and outreach to keep households and vulnerable populations ready in case of a disaster using websites, social media, local media, utility inserts, mailings, etc. Develop new websites or communication outlets where necessary. 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, Tier II, among others. Additional attention should be given to flooding, hazardous materials, severe weather, fire, truck routes, and safe routes to school. Outreach and attention should be given to mass notification systems.					
		<p>Existing websites: City of New Rockford, Eddy County, NDSU Extension/Eddy County, CASNR website, Lutheran Home of the Good Shepherd, New Rockford-Sheyenne Public School, Lake Region District Health Unit, City of Sheyenne</p> <p>Existing social media: Eddy County Facebook page, New Rockford Fire Department Facebook page, CASNR Facebook, Eddy County Sheriff’s Office, Lutheran Home of the Good Shepherd, Lake Region District Health Unit, City of Sheyenne, City of New Rockford</p> <p>Develop new: Pursue additional social media platforms such as Instagram and Snapchat, where appropriate.</p>					
Hazard/Threat Addressed		All Hazard /Threats					
Affected Jurisdiction(s)		Eddy County and Incorporated Jurisdictions					
Project Status		New/Ongoing and Continue					
Priority		Very High					
Responsible Agency		County Commission, City Council(s), Emergency Management, Emergency Services, Public Schools					
Partners		Extension, Media, Public Health, Public Utilities					
Completion Timeframe		Ongoing	Cost	\$1,000 to 2,000 annually			
Funding Source		Local resources. State and federal grants. Public Utilities.					
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	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Eddy County LEOP Eddy County Mitigation Plan Eddy County THIRA		Capability Assessment, Hazard History, Risk Assessment			Develop and review by appropriate jurisdictions or agencies. Review by state’s attorney. Distribute.		

Eddy County Project EO-2: Increase Awareness of Methods for Prevention of Infectious Disease & Pest Infestations.

Description/Benefit	<p>Make the public aware of the risk of infectious diseases and methods for prevention in people, animals and crops for economic impact. Methods should focus on young and elderly populations (vulnerable and all populations), handwashing, influenza preparedness, and strategies used in agriculture-based economies such as pesticides, fungicides, herbicides and insecticides.</p> <p>New and future awareness should include social distancing and other measures to prevent the spread of infectious diseases.</p>		
Hazard/Threat Addressed	Infectious Disease (All)		
Affected Jurisdiction(s)	Eddy County and Incorporated Jurisdictions		
Project Status	Ongoing and Continue/New		
Priority	Medium		
Responsible Agency	Extension, Public Health, Weed Board, public information officers		
Partners	Emergency Management, Emergency Services, Dept. of Natural Resources, FSA, NDDA/State Veterinarian, NDDH, Medical Services Providers, RD, Stockmen’s Association, USDA		
Completion Timeframe	Ongoing	Cost	Project-specific
Funding Source	Extension. Public Health. Local, state and federal budgets or 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	5	5	5	5	35

Integration of Mitigation Plan Requirements into Local Planning Mechanisms

<u>Planning Mechanisms Utilized</u>	<u>Plan Element</u>	<u>Process for Integration</u>
Public Health (all plans) Eddy County LEOP Eddy County Mitigation Plan Eddy County THIRA	Capability Assessment, Hazard History, Risk Assessment	Development by Public Health/respective agency. Approval by county commission, city council(s) and emergency management. Distribute.

Eddy County Project EO-3: Increase Awareness of Drought Tolerant Practices and Soil Conservation Methods in Farming and Ranching, and Incorporated Jurisdictions.

Description/Benefit	Make the public aware of crop programs, drought tolerant practices and soil conservation 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. A public awareness campaign for water conservation can increase awareness of drought.						
Hazard/Threat Addressed	Drought, Fire (Wildland), Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	Eddy County and Incorporated Jurisdictions						
Project Status	Ongoing and Continue/New						
Priority	Medium						
Responsible Agency	Extension, NRCS						
Partners	Emergency Management, Emergency Services, Eddy County Soil Conservation District, Media, Weed Board, USDA (FSA)						
Completion Timeframe	Ongoing	Cost	Contact Extension Office				
Funding Source	Rural Development. NRCS. Local resources. State and federal grants. North Dakota State University.						
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	5	5	5	35
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) Eddy County LEOP Eddy County Mitigation Plan Eddy County THIRA		Capability Assessment, Hazard History, Risk Assessment			Development by NDSU Extension. Approval by county commission, city council(s) and emergency management. Distribute.		

Eddy County Project EO-4: 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	<p>Make the public aware of the risk of shortage of critical materials and/or infrastructure and encourage citizens to be self-sufficient. Use Grant Counties ‘Are You Prepared?’ brochure developed by Eddy County Public Health.</p> <p>Educate residents on the importance of an emergency kit and household emergency response plan, shelter-in-place, stocking of food and medical supplies, fuel for heating, backup power generation. Education should also</p>						
Hazard/Threat Addressed	All						
Affected Jurisdiction(s)	Eddy 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 Council(s), Extension, Food Pantries, Media, NDDDES, NDDHHS, 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.						
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	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Eddy County LEOP Eddy County Mitigation Plan State Vulnerable Populations Plan Eddy County Public Health (all plans) Eddy County THIRA		Capability Assessment, Hazard History, Risk Assessment			Development by Emergency Management, Public Health, Public Schools, and Public Utilities. Approval by county commission, city council(s), school boards. Distribute.		

Eddy County Project EO-5: Conduct Continuous Preventative Education to Increase Awareness of Cyberattack Threats.

Description/Benefit		<p>Make the 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. Specific attention should be paid to the framework developed and included in the K20W Initiative. Specific information should be developed for incorporated cities to protect utility infrastructure (i.e., SCADA Systems, etc.)</p> <p>Specific education opportunities should be made available to staff at the Eddy County Courthouse, New Rockford-Sheyenne Public School, city hall, Lutheran Home of the Good Shepherd (LHGS)</p>					
Hazard/Threat Addressed		Cyberattack					
Affected Jurisdiction(s)		Eddy County and Incorporated Jurisdictions					
Project Status		New					
Priority		Very High					
Responsible Agency		Eddy County and Public Schools in partnership with NRG and NDIT					
Partners		County Commission, City Council(s), Emergency Management, Emergency Services, Public Schools					
Completion Timeframe		Ongoing	Cost		Project-specific		
Funding Source		Local budgets. State and federal grants. NDIT. Homeland Security Grant Program.					
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	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Eddy County LEOP Eddy County Mitigation Plan Eddy County THIRA		Capability Assessment, Hazard History, Risk Assessment			Development by Eddy County Office of Emergency Management, NDIT, NRG, and public schools. Approval by county commission, city council(s), emergency management, school board Distribute.		

Eddy County Project EO-6: Assist in the Annual Update of Lake Region District Health/Lake Region District Health’s Strategic Plan.

Description/Benefit	Lake Region District Health (ECPH) provides public health services to Eddy County. The strategic plan for ECPH is required to be updated on an annual basis. The county should assist ECPH in this update where possible.						
Hazard/Threat Addressed	Infectious Disease (All)						
Affected Jurisdiction(s)	Eddy County and Incorporated Jurisdictions						
Project Status	Ongoing and Continue						
Priority	High						
Responsible Agency	Public Health						
Partners	Emergency Management, Emergency Services, Medical Services Providers						
Completion Timeframe	Ongoing	Cost	Staff time and printing				
Funding Source	Public Health. Local, 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	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Public Health (all plans) Eddy County LEOP Eddy County Mitigation Plan Eddy County THIRA		Capability Assessment, Hazard History, Risk Assessment			Development by Public Health. Approval by board. Distribute.		

Eddy County Project EO-7: Assist Lake Region District Health in Annual Updates to the Eddy County Vaccination Outreach Plan and Perform Outreach.

Description/Benefit		<p>The influenza vaccination rate for school-aged children in Eddy County needs to be increased. Develop outreach with the goal of increasing this rate to 100 percent. Recent immunization funding from the N.D. of Health will assist public health in increasing immunizations, creating a written outreach plan, and identify strategies to improve vaccine confidence in the community.</p> <p>It should be noted that the overall goal of 100 percent influenza vaccination for school-aged children is an objective/goal of Eddy County. However, the rights of individual medical freedom and parent’s rights for the health of their children supersedes any local government objective/goal.</p> <p>All public schools in Eddy County follow the immunization requirements set forth by the N.D. Dept. of Health and Human Services. Exemptions are available to any parent or student who wishes to obtain one.</p>					
Hazard/Threat Addressed		Infectious Disease (only those that are vaccine preventable)					
Affected Jurisdiction(s)		Eddy County, incorporated jurisdictions and unincorporated jurisdictions. Specific attention paid to communities with schools, care centers/nursing homes, higher education, and institutionalized populations.					
Project Status		Ongoing and Continue/New (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
2	5	5	2	5	5	5	29
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Eddy County LEOP Eddy County Mitigation Plan Eddy County THIRA Eddy County Public Health (all plans)		Capability Assessment, Hazard History, Risk Assessment			Developed by Eddy County Public Health. Approval by board, public schools and emergency management. Distribute.		

Eddy County Project EO-8: Develop and 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 quality. The program should focus on stock dams, well water, streams, and watersheds. Crops should be checked for nitrates.		
Hazard/Threat Addressed	Dam Failure, Drought, Flood, Infectious Disease, Severe Summer Weather, Severe Winter Weather		
Affected Jurisdiction(s)	Eddy County and Incorporated Jurisdictions		
Project Status	New		
Priority	High		
Responsible Agency	Extension		
Partners	County Commission, City Council(s), Emergency Management, Emergency Services, Eddy County Soil Conservation District, Producers, Media, N.D. Stockmen’s Association (NDSA), Weed Board, USDA (FSA, NRCS)		
Completion Timeframe	1 year. Ongoing and Continue.	Cost	\$3,000.00
Funding Source	NDSU Extension/Eddy County. County budget. Grants (pay for water and feed test equipment).		

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	5	5	5	35

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) Eddy County LEOP Eddy County Mitigation Plan Eddy County THIRA	Capability Assessment, Hazard History, Risk Assessment	Development by NDSU Extension/Eddy County. Review and approval by county commission. Updating of local plans.

Eddy County Project EO-9: Conduct Education and Outreach on Fire Safety and Prevention, Burn Restrictions, State Fire Indexes, and Regional/State Burning Regulations and Restrictions.

Description/Benefit	<p>Make the public aware of methods to remain safe from risk of urban fire and wildland 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. Evaluate and/or create defensible space around structures to include removing debris accumulation with special attention given to Tier II locations. Promote Firewise Safety practices.</p> <p>Educate the public on burn bans and state fire indexes. Reduce the risk of fire hazard from outdoor burning by residents and provide means of communication. Explore surface water access options for fire suppression. https://ndresponse.gov/burn-ban-restrictions-fire-danger-maps</p>						
Hazard/Threat Addressed	Drought, Fire (Wildland), Hazard Material Release, Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	Eddy County and Incorporated Jurisdictions						
Project Status	Ongoing and Continue/New (new to the mitigation plan, but has always been executed by fire departments)						
Priority	High. Primarily summer but can occur in spring and fall.						
Responsible Agency	County Commission, Emergency Management, Emergency Services						
Partners	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.						
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	3	3	5	5	29
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Eddy County LEOP Eddy County Mitigation Plan Eddy County THIRA		Capability Assessment, Hazard History, Risk Assessment			Development by Emergency Management and Emergency Services. Approval by county commission. Distribute.		

Eddy County F-1: Strengthen and Expand Existing or Implement New Financial Mitigation Capabilities.

Description/Benefit	Expand financial mitigation capabilities to generate funds for completion of mitigation projects. <ol style="list-style-type: none"> 1. Create and implement impact fees for new development in areas prone to impacts from natural hazards and man-made threats. 2. Restructure and improve building permit fees. 3. Restructure and increase utility fees based on projected future infrastructure maintenance costs and necessary capital improvements. 4. Create revenue stream and allocate resources to invest in equipment and emergency services capabilities. 						
Hazard/Threat Addressed	All						
Affected Jurisdiction(s)	Eddy County and Incorporated Jurisdictions						
Project Status	Ongoing and Continue						
Priority	Very High						
Responsible Agency	County Commission, 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.						
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
1	5	5	3	3	4	5	26
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>			<u>Plan Element</u>		<u>Process for Integration</u>		
City Council(s) and County Commission Planning Commission			Capability Assessment, Hazard History, Risk Assessment		Research effectiveness. Approval and adoption by county commission and city council(s).		

Eddy County Project PR-1: Assure Eddy 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. Update plan on a continuing basis between plan update grant applications. See Chapter 10 and Appendix 8 of this plan.						
Hazard/Threat Addressed	All						
Affected Jurisdiction(s)	Eddy County and Incorporated Jurisdictions						
Project Status	New						
Priority	High						
Responsible Agency	County Commission, Emergency Management						
Partners	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.						
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	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<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 council(s). Approval NDDDES and FEMA.		

Eddy County PR-2: Update/Expand Existing and/or Create New Planning and Regulatory Capabilities to Address Existing and New Development.

Description/Benefit		<p>Build the planning and regulatory capability of Eddy County and incorporated jurisdictions by updating existing and/or expanding and create new plans, policies, and ordinances. To ensure new and existing structures adhere to building standards to withstand impacts from hazards. Energy development (oil and gas) in the western portions of the state may lead to economic and population growth in the future. Specific research should be conducted to address community fire/wildfire protection, cybersecurity, drought management, flood ordinances and management, grain bins, hazardous materials, impact fees, man camps, mitigation, rodent control, site plan review requirements, storm water management, and water conservation. 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. Develop and implement a county-wide computer security system/policy.</p> <p>A list of plans, policies, codes and ordinances needing to be updated or created for Eddy County and incorporated jurisdictions are bolded in text narratives and are found in Chapter 7, Capability Assessment.</p> <p>Eddy County should work with Lake Region District Health to develop a Continuity of Operations Plan and Mass Casualty Plan, and update zoning for HAZMAT sites and industrial development not conducive to current land uses.</p> <p>Eddy County should develop subdivision ordinances for permanent rural residential development.</p>					
Hazard/Threat Addressed		All					
Affected Jurisdiction(s)		Eddy County and Incorporated Jurisdictions					
Project Status		Ongoing and Continue					
Priority		High					
Responsible Agency		County Commission, City Council(s), Planning & Zoning					
Partners		Emergency Management, Emergency Services, NDACo, NDDDES, NDLC, Public Works, RD					
Completion Timeframe		Ongoing	Cost	\$0 to \$100,000 / Staff-time			
Funding Source		Local budgets. Local, 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
3	5	4	3	3	4	5	27
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<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 council(s).		

Eddy County PR-3: Encourage Jurisdictional Participation/Enroll 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)	City of Sheyenne						
Project Status	Ongoing and Continue/New						
Priority	High						
Responsible Agency	County Commission, City Council(s), Emergency Management						
Partners	DWR, Planning & Zoning, Water Resource District						
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
4	5	5	3	4	4	5	30
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Flood Ordinances Eddy County LEOP, Flood Annex Eddy County Mitigation Plan Eddy County THIRA National Flood Insurance Program (NFIP)		Capability Assessment, Hazard History, Risk Assessment			Approval and adoption by county commission and city council(s).		

Eddy 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 Eddy County and incorporated jurisdictions meet or exceed the NFIP and/or to prepare for enrollment in the NFIP.						
Hazard/Threat Addressed	Flood (overland and riverine), Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	Eddy County and City of New Rockford. City of Sheyenne (once enrolled).						
Project Status	Ongoing and Continue						
Priority	Very High						
Responsible Agency	County Commission, City Council(s), Emergency Management, Planning & Zoning						
Partners	DWR, Emergency Services, NDACo, NDDDES, NDLC						
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
4	5	5	4	4	5	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>		
Flood Ordinances Eddy County LEOP, Flood Annex Eddy County Mitigation Plan Eddy County THIRA National Flood Insurance Program		Capability Assessment, Hazard History, Risk Assessment			Approval and adoption by county commission and City Council(s).		

Eddy County PR-5: Create Post-Disaster Debris Management Plan and Update on an Annual Basis.

Description/Benefit		Provide temporary staging site for disposal of waste from structures to improve resiliency and recovery efforts and maintain quality of life. Establishment of a management plan increases disaster reimbursement from FEMA by five percent.					
Hazard/Threat Addressed		All					
Affected Jurisdiction(s)		Eddy County and Incorporated Jurisdictions					
Project Status		Ongoing and Continue					
Priority		Medium					
Responsible Agency		County Commission, City Council(s), Emergency Management, Planning & Zoning, Public Works					
Partners		NDACo, NDDes, NDLC, Public Health, Public Utilities, Water Resource District					
Completion Timeframe		1 year. Annual review.			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
5	5	5	4	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>		
Eddy County LEOP (Appendix) Eddy County Mitigation Plan Eddy County THIRA Planning Commission		Capability Assessment, Hazard History, Risk Assessment			Organize planning committee and create plan. Approval and adoption by county commission and city council(s). Update annually.		

Eddy County PR-6: 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)		Eddy County and Incorporated Jurisdictions					
Project Status		New					
Priority		Medium					
Responsible Agency		Extension, N.D. State Vet Office, local producers and/or veterinarians					
Partners		Emergency Management, Emergency Services, Weed Board, wrecker services					
Completion Timeframe		1 year	Cost	\$75 to \$100 per person. Staff time.			
Funding Source		Central Grasslands Research Extension Center. N.D. Beef Commission. 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
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Eddy County LEOP Eddy County Mitigation Plan Eddy County THIRA		Capability Assessment, Hazard History, Risk Assessment			Develop draft plan and formally adopt by county commission. Integrate into local emergency services response protocols.		

Eddy County PR-7: Update Flood Operations/Management Annex in the Eddy County Local Emergency Operations Plan (LEOP) Annually.

Description/Benefit	Flooding impacts Eddy County on an annual basis to varying degrees of severity. The Flood Operations/Management Annex in the Eddy County Local Emergency Operations Plan should be updated annually based on the flooding event of the preceding year.						
Hazard/Threat Addressed	Dam Failure, Flood, Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	Eddy County and Incorporated Jurisdictions						
Project Status	New						
Priority	Very High						
Responsible Agency	County Commission, City Council(s), Emergency Management, Emergency Services, Planning & Zoning, Public Works						
Partners	NDDDES, Public Health, Public Utilities, DWR, Water Resource District, VOAD.						
Completion Timeframe	1 year. Annual updates.	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
5	5	5	3	3	5	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>		
Eddy County LEOP, Flood Annex Eddy County Mitigation Plan Eddy County THIRA Planning Commission		Capability Assessment, Hazard History, Risk Assessment			Utilize the Eddy County LEPC or Mitigation Plan Steering Committee to update annually. Approval and adoption by county commission and city council(s).		

Eddy County Project I-1: Assure Continued Monitoring and Maintenance of Warwick Dam and All Other Dams In Eddy County.

Description/Benefit		To protect human life and property from dam failures. <u>EAPs and contact information should be updated on an annual basis for each respective dam.</u> See Chapter 4.4 Dam Failure for additional information on high and medium hazard dams in Eddy County. A full list of dams in Eddy County can be found in the hazard history for the county on a disc at the beginning of this plan.					
Hazard/Threat Addressed		Dam Failure, Flood, Severe Summer Weather, Severe Winter Weather					
Affected Jurisdictions		Eddy County and Incorporated Jurisdictions					
Project Status		Ongoing and Continue					
Priority		Very High					
Responsible Agency		Emergency Management					
Partners		County Commission, City Council(s), Engineering, Public Works					
Completion Timeframe		Ongoing.	Cost	To be determined. Project specific.			
Funding Source		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	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Eddy County LEOP Eddy County Hazard Mitigation Plan Eddy County THIRA		Capability Assessment, Hazard History, Risk Assessment, dam failure statistics			Work with state agencies to incorporate monitoring and maintenance schedules into local planning mechanisms.		

Eddy County Project I-2: Retrofit and/or Upgrade Bridges, Culverts, Roads and/or Grade Raises, Stormwater Pipes, and Underpasses to Withstand Natural Hazards and Adversarial Threats to Prevent Blockage to Maintain Access for Emergency Services.

Description/Benefit		Increase resiliency of bridges, culverts and railroads, roads, and stormwater pipes to maintain transportation to assure economic vitality and access for emergency services. A detailed description of each bridge, culvert and road can be obtained by contacting the Eddy County Road Department. <ul style="list-style-type: none"> U.S. Highway 281 bridge over the James River north of the city. 					
Hazard/Threat Addressed		Drought, Fire (Wildland), Flood (overland and riverine), Hazardous Material Release, Severe Summer Weather, Severe Winter Weather					
Affected Jurisdiction(s)		Eddy County and Incorporated Jurisdictions					
Project Status		Ongoing and Continue/New					
Priority		Very High					
Responsible Agency		County Commission, FHWA, FRA, NDDOT, Public Works, Water Resource District					
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.					
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	4	2	3	28
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Eddy County LEOP Eddy County Mitigation Plan Eddy 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, township boards, and City Council(s).		

Eddy County Project I-3: Construct New Storm Shelters/Community Safe Rooms or Retrofit Existing Structures to Reduce and/or Eliminate the Risk to Vulnerable Populations and the Public.

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 jurisdictions currently lacking a storm shelter/safe room. Procure shelter supplies where necessary. More information on community shelters can be found through the following link: https://www.fema.gov/media-library/assets/documents/5090					
		<p>Purchase cots and store at Ostby Hall and Brown Memorial.</p> <ul style="list-style-type: none"> • Eddy County: Warsing Dam • New Rockford: Brown Memorial • Sheyenne: Ostby Hall 					
Hazard/Threat Addressed		All					
Affected Jurisdiction(s)		Eddy County and Incorporated Jurisdictions					
Project Status		Ongoing and Continue					
Priority		High					
Responsible Agency		Emergency Management, Emergency Services, Public Health					
Partners		County Commission, City Council(s), NDDDES, Red Cross, Social Services, private housing/community owners,					
Completion Timeframe		5+ years		Cost		\$75,000.00 to \$150,000.00 per shelter	
Funding Source		Local, state and federal grants. FEMA’s Building Resilient Infrastructure and Communities (BRIC) Grant Program.					
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	5	4	4	33
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>			<u>Plan Element</u>			<u>Process for Integration</u>	
Eddy County LEOP Eddy County Mitigation Plan Eddy County THIRA			Capability Assessment, Hazard History, Risk Assessment			Approval by county commission, City Council(s), and private house/community owners	

Eddy County Project I-4: Conduct Hydrology/Engineering Study for Pipestem Creek and Rocky Run Creek to Identify Effective Flood Control Measures and Drainage Improvements.

Description/Benefit		Construction of detention/retention ponds, floodwalls, berms, revetments or bioengineered bank-stabilization techniques to slow runoff of overland flooding from heavy rains and snowmelt, and flood waters from riverine flooding. Detention/retention ponds provide controlled release of water and reduce/eliminate areas and structures from being inundated with flooding. <i>No specific areas or sites. Emergency Management would like to see both bodies of water engineered from the top to the bottom to determine if culvert sizes are adequate to prevent roads washing out during high water events.</i>					
Hazard/Threat Addressed		Dam Failure, Flood (riverine and overland), Severe Summer Weather, Severe Winter Weather					
Affected Jurisdiction(s)		Eddy County and Incorporated Jurisdictions (townships)					
Project Status		Ongoing and Continue					
Priority		High					
Responsible Agency		County Commission, Water District					
Partners		City Council(s), Emergency Management, Emergency Services, DWR, Public Works, NDDDES					
Completion Timeframe		2-3 years	Cost	Ongoing			
Funding Source		Local, 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
1	4	5	2	3	2	3	20
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Eddy County LEOP Eddy County Mitigation Plan Eddy 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. Receive funding through NRCS.		

Eddy County Project I-5: Support the Eddy County, North Dakota Water Resource District Capital Improvement Plan.

Description/Benefit		Stop Wells County! The WRD has drain maintenance plans and culvert upgrade plan.					
Hazard/Threat Addressed		Flood, Infectious Disease, Severe Summer Weather, Severe Winter Weather					
Affected Jurisdiction(s)		Eddy County and Incorporated Jurisdictions					
Project Status		New					
Priority		Very High					
Responsible Agency		County Commission, Water Resource District					
Partners		Emergency Management, Emergency Services, DWR					
Completion Timeframe		TBD		Cost	Project specific		
Funding Source		Local budgets. DWR. WRD. FEMA's BRIC or HMGP Grant Programs.					
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	4	3	5	2	3	26
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Eddy County LEOP Eddy County Mitigation Plan Eddy County THIRA Eddy County Water Resource District Board Capital Improvement Plan		Capability Assessment, Hazard History, Risk Assessment			Commission further studies or construction estimates through a formal bidding process. Select contractor(s). Apply for grant funding to execute or budget in local budgets.		

Eddy County Project I-6: Remove and Reposition Ineffective Living Snow Fences at Strategic Points to Maintain Visibility and/or Install New Living Snow Fences.

Description/Benefit		Removal of trees and vegetation too close to sides of roads and flatten back slopes. Replace and plant new trees in appropriate areas to reestablish living snow fences. Call road guy.					
Hazard/Threat Addressed		Infectious Disease, Severe Summer Weather, Severe Winter Weather, Transportation Incident					
Affected Jurisdiction(s)		All					
Project Status		Ongoing and Continue					
Priority		Low					
Responsible Agency		Road Department					
Partners		Emergency Management, Emergency Services, NRCS, NDGF, USFS					
Completion Timeframe		Ongoing	Cost	Ongoing			
Funding Source		Local budgets and department staff and resources. NRCS.					
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	3	3	5	29
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Eddy County LEOP Eddy County Mitigation Plan Eddy 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. Receive funding through NRCS.		

Eddy County Project I-7: Retrofit and/or Expand Existing Storm Water and Sanitary Sewer Systems in Incorporated Cities to Increase Capacity to Reduce and/or Eliminate Occurrences of Overland Flooding.

Description/Benefit		Improve drainage to reduce or eliminate flooding and related damage to property and critical facilities and infrastructure. Reduce or eliminate outages of power and sanitary sewers. New Rockford sanitary sewer lagoon system (cell #1) needs to be dredged. Sewer lines in the city need to be lined.					
Hazards Addressed		Flood (overland), Severe Summer Weather, Severe Winter Weather					
Affected Jurisdiction(s)		Eddy County and Incorporated Jurisdictions					
Project Status		New					
Priority		High					
Responsible Agency		County Commission, City Council(s)					
Partners		Emergency Management, Planning & Zoning, Public Works, NDAC, NDDES, NDLC, Regional Council					
Completion Timeframe		5 to 10 years			Cost	Project-specific	
Funding Source		Local, 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	4	5	1	3	28
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
Planning Mechanisms Utilized			Plan Element Utilized			Process for Integration	
Eddy County LEOP Eddy County Mitigation Plan Eddy County THIRA			Capability Assessment, Hazard History, Risk Assessment			Approval by county commission and city councils	

Eddy County Project I-7: Upgrade Existing and/or Construct New Fire Halls/Community Centers in Incorporated Jurisdictions.

Description/Benefit		The size of existing facilities does not provide adequate space for emergency services to facilitate an appropriate emergency operations center and store equipment. Inadequate workspace for emergency services personnel and supportive staff is also an issue. A combination of this project with Project I-3 would provide backup power generation improving county and city sheltering capabilities.					
		The Sheyenne Fire Department constructed a new fire hall in 2021.					
		The City of New Rockford’s Fire Hall is undersized and outdated.					
Hazards Addressed		All					
Affected Jurisdiction(s)		New Rockford					
Project Status		New					
Priority		High					
Responsible Agency		City Council(s) and Emergency Services					
Partners		County Commission, Emergency Management, Planning & Zoning, Public Works, NDAC, NDDDES, NDLC, Regional Council					
Completion Timeframe		5 to 10 years	Cost	Project-specific			
Funding Source		Local district fees or updating of existing taxes. State and federal grants. CBDG program. Private loans.					
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	4	4	5	1	3	26
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Eddy County LEOP Eddy County Mitigation Plan Eddy County THIRA Eddy County Water Resource District Capital Improvement Plan		Capability Assessment, Hazard History, Risk Assessment			Apply for engineering and design funding. Develop specifications. Pursue grant funding or low-interest loans. Approval by city councils.		

6.2 Wells County, North Dakota Mitigation Strategy

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. 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.

Wells County

Wells County can be impacted by communicable disease, drought, flood (overland and riverine), hazardous material release, severe summer weather, severe winter weather, urban fire/structure collapse, wildland fire, and windstorm. Flooding causes annual damage to property due to the presence of high-water tables, inadequate drainage, closed basins, and the source of the Sheyenne River located in neighboring Wells County. Economic loss to the agriculture and livestock industry occurs on a frequent basis. Critical facilities in the county and incorporated jurisdictions need generators for backup power and upgraded emergency alerting. The county needs to retrofit existing or construct new storm shelters. The county has planning and regulatory, administrative and technical, education and outreach, financial, and planning and regulatory capabilities to accomplish mitigation. However, these capabilities need to be improved and expanded. The county relies on outside sources for funding and to accomplish large-scale mitigation projects.

Improvement and expansion of mitigation capabilities; upgrading of sirens, equipment, and installation of generators; construction of flood control measures; and upgrading of critical facilities and infrastructure are a priority for the county.

Wells County Project AT-1: Strengthen and Expand Administrative and Technical Mitigation Capabilities.

Description/Benefit		Expand administrative and technical mitigation capabilities to improve county readiness and preparedness. <u>Administration:</u> Update mutual aid agreements on a continuous basis. Special attention should be paid to public schools. Convert verbal to written. <u>Staff:</u> Conduct Floodplain Administrator and Planning and Zoning education in Wells County. Research options for relinquishing incorporated jurisdiction (township) and unincorporated communities’ administration to Wells County. Educate staff to enforce building codes. Support and continue development of GIS coordinator position. <u>Technical</u> <ul style="list-style-type: none"> • Install solar-powered electronic fire index signs – See Wells County Project AT-4 • Install permanent generators – See Wells County Project AT-5 • Install and/or expand directional signage for emergency services and for truck/hazmat routes wherever missing or needed – ordinances may be necessary. Some incorporated cities need truck route signage expansion and/or upgrade. South-facing signs become sun-bleached and need replacement often. • Install faraday cages/shields at digital/technological infrastructure systems at critical facilities and infrastructure • Install enhanced cybersecurity countermeasures (i.e., PA Traps/malware, multi-factor authentication, etc.) - specific attention should be paid to the recommendations made in N.D. Cybersecurity Maturity Assessment. 					
Hazard/Threat		All (Space Weather)					
Affected Jurisdictions		Wells County and Incorporated Jurisdictions					
Project Status		Ongoing and Continue/New					
Priority		High					
Responsible Agency		County Commission, City Council(s), Emergency Services, NDIS, Public Schools, Public Works, Public Utilities					
Partners		Emergency Management, Extension, Planning & Zoning					
Completion Timeframe		Ongoing	Cost	Project-specific			
Funding Source		Local budgets. State and federal grants. FEMA. Public Utilities. Regional Council. RD. USFS.					
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	4	5	3	4	30
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Wells County LEOP & Mitigation Plan Wells County THIRA		Capability Assessment, Hazard History, Risk Assessment			Solicit project scope of work. Pursue grant funding or use local funds.		

Wells County Project AT-2: Expand and Enforce Building Codes.

Description/Benefit	Improve administrative and technical, and planning and regulatory capabilities through establishment of a building code enforcement contract from an outside source, establishment of a county position or education of existing county departments, to enforcement of building codes. Building codes can be enforced to increase structural integrity of new structures or renovation of existing.		
Hazards Addressed	All Hazards and Threats		
Affected Jurisdiction(s)	Wells County and Incorporated Jurisdictions		
Project Status	Ongoing and Continue		
Priority	Medium		
Responsible Agency	City Council(s), County Commission, Planning & Zoning		
Partners	Emergency Services, NDACo, NDDHHS, NDLC, Public Health, Township Boards		
Completion Timeframe	Ongoing	Cost	Project-specific
Funding Source	Local, state, federal grants. City Councils. County Commission.		

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	3	2	4	3	5	26

Integration of Mitigation Plan Requirements into Local Planning Mechanisms

<u>Planning Mechanisms Utilized</u>	<u>Plan Element</u>	<u>Process for Integration</u>
Planning and Zoning Wells County LEOP & Mitigation Plan Wells County THIRA	Capability Assessment, Hazard History, Risk Assessment	Approval by county commission, city councils or township board.

Wells County Project AT-3: Upgrade and/or Expand Emergency Alerting/Communications and/or Outdoor Early Warning System(s).

Description/Benefit		<p>Coverage of current outdoor early warning system/sirens does not provide coverage to an adequate geographic expanse of the county. Upgrade existing manually-activated sirens to dispatch-activated sirens. Install new dispatch-activated sirens where necessary. There are no existing outdoor early warning sirens for the county outside incorporated cities. Purchase NOAA weather radios for rural communities.</p> <ul style="list-style-type: none"> • Upgraded: City of Bowdon, City of Fessenden, City of Harvey, City of Hurdsfield, City of Sykeston • NOAA Weather Radios: City of Cathay, City of Hamberg; Heimdal (unincorporated) <p><i>Sirens for the city of Harvey were installed in 2017. Upgraded sirens were installed for the city of Fessenden, Sykeston, and Hurdsfield will be installed in late 2017/2018.</i></p>					
Hazard/Threat Addressed		Flood, Hazardous Material Release, Severe Summer Weather, Fire (Wildland)					
Affected Jurisdiction(s)		Wells County and Incorporated Jurisdictions					
Project Status		Ongoing and Continue					
Priority		Medium					
Responsible Agency		City Council(s), Emergency Management, Emergency Services					
Partners		County Commission, BOR, FEMA, NDDDES, NWS, Public Works					
Completion Timeframe		Ongoing	Cost	Siren: Up to \$30,000 per siren			
Funding Source		Local budgets. 9-1-1 funding. State Homeland Security Grant Program. FEMA.					
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	5	4	5	34
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Wells County LEOP Wells County Mitigation Plan Wells County THIRA		Capability Assessment, Hazard History, Risk Assessment			Develop specifications. Received EHP approval. Pursue grant funding. Approval by county commission/City Council(s).		

Wells County Project AT-4: Install Digital Fire Index Signage at Strategic Points in Wells County.

Description/Benefit		<p>Improve public awareness and education of North Dakota Fire Danger index through installation of fire index signs. The fire danger index from the state provides an indication of rural fire potential for grasslands, and its ability to spread.</p> <p>Upgrade: Manual fire index sign to a digital sign in the city of Harvey outside Harvey Armory/City Hall/Fire Hall.</p> <p>New Digital Signs: City of Fessenden outside fire hall, Intersection of U.S. Highway 52 and N.D. Highway 15, and U.S. Highway 52 and N.D. Highway 200</p>					
Hazards Addressed		Fire (Urban & Wildland), Hazardous Material Release, Severe Summer Weather					
Affected Jurisdiction(s)		Wells County and Incorporated Jurisdictions					
Project Status		Ongoing and Continue					
Priority		Medium					
Responsible Agency		Emergency Management, Emergency Services					
Partners		County Commission, Public Works, NDDOT, NWS, Media, USFS					
Completion Timeframe		2 years	Cost	\$15,000 to \$30,000 per sign			
Funding Source		Local, state, federal grants. USFS.					
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	3	4	31
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Wells County LEOP Wells County Mitigation Plan Wells County THIRA		Capability Assessment, Hazard History, Risk Assessment			Approval by county commission and city councils		

Wells County Project AT-5: Install New or Upgrade Existing Permanent or Portable Generators at Critical Facilities and Infrastructure.

Description/Benefit		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: <u>Upgrade</u> <ul style="list-style-type: none"> Wells County Shops, Wells County Courthouse (400-amp automatic transfer switch), Festival Hall (Wells County Fairgrounds). Additional redundancies in power grid systems are a high priority. <u>Install new</u> <ul style="list-style-type: none"> City of Bowdon: Water pump station, ambulance hall, locker plant and grocery store (publicly-owned), water tower (portable) City of Cathay: City hall/fire hall, lift station, county shop, and pumphouse and water well City of Fessenden: Fessenden-Bowdon Public School, lift stations, city shop, ambulance hall City of Harvey: B.M. Hanson Elementary, Harvey High School, Harvey Ambulance Hall, St. Aloisius Hospital & Medical Center, Wells County Public Health City of Hurdsfield: Lift station, community center City of Sykeston: Lift station, water plant, water tower for recirculation pump. Fire hall generator was installed two years ago. 					
Hazard/Threat Addressed		All Hazard/Threats					
Affected Jurisdiction(s)		Wells County and Incorporated Jurisdictions					
Project Status		Ongoing and Continue					
Priority		Very High					
Responsible Agency		County Commission, City Council(s), Emergency Management, Emergency Services					
Partners		Medical Services Providers, Public Works, Public Utilities					
Completion Timeframe		Ongoing	Cost		Project-specific		
Funding Source		Public Utilities. Regional Council. RD. USDA. FEMA’s Building Resilient Infrastructure and Communities (BRIC) Grant Program. State Homeland Security Grant Program.					
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	4	4	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>		
Wells County LEOP & Mitigation Plan Wells County THIRA		Capability Assessment, Hazard History, Risk Assessment			Procure scope of work for project. Received EHP Approval. Apply for grant funding.		

Wells County Project AT-6: Upgrade Existing/Purchase New Equipment & Infrastructure for Emergency Services & Incorporated Jurisdictions.

Description/Benefit	Purchase and/or install upgraded equipment for ambulance, fire, law enforcement, medical facilities and special units. Improve administrative and technical capabilities of emergency services to mitigate the impact of hazards.						
	<p>St. Aloisius Hospital & Medical Center: Decontamination, mass casualty supplies, PAPR, new boiler, cots Bowdon, City of: Type III Barricades Bowdon Ambulance Service: 100-watt repeater, generator for ambulance hall Bowdon Volunteer Fire Department: SCBAs, bunker gear, radios, ATV wildland fire units, compressor Cathay Volunteer Fire Department: SCBAs, bunker gear, fire truck, ATV wildland fire units, compressor Fessenden, City of: Type III Barricades, single-axle dump truck with adjustable blade and snow blower Fessenden Ambulance Service: Generator for ambulance hall, upgraded lighting Fessenden Volunteer Fire Department: 4500 PSI tanks, compressor, SCBAs and tank, SIRN 2020 Radios, new fire hall, upgrade or add an ATV wildland fire unit Harvey Ambulance Service: Generator for ambulance hall Harvey Volunteer Fire Department: SCBAs, bunker gear, command vehicle Harvey Police Department: TBD Sykeston Volunteer Fire Department: SCBA's and tanks, computer, wildland fire units, compressor Wells County Sheriff's Office: TBD Wells County: Purchase up to two snow blowers to mount on county trucks and pay loader.</p>						
Hazard/Threat Addressed	All Hazard /Threats						
Affected Jurisdiction(s)	Wells County and Incorporated Jurisdictions						
Project Status	Ongoing and Continue						
Priority	High						
Responsible Agency	Emergency Management, Emergency Services						
Partners	County Commission, City Council(s)						
Completion Timeframe	Ongoing	Cost		Project-specific			
Funding Source	Local budgets. State and federal grants. CDBG, Emergency Services, FEMA, HUD, Public Utilities, RD. State Surplus.						
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	5	4	5	34
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		

Wells County LEOP Wells County Mitigation Plan Wells 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).
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Wells County Project AT-7: Encourage Fire Departments to Digitize Incident History.

Description/Benefit	The fire departments based in and serving Wells County maintain paper copies of incident history. Hardcopies are at risk of damage from fire and other miscellaneous hazards at the fire hall. Analysis of incident history is challenging at best with paper files. In addition, grant writing and funding requests are streamlined with detailed incident information/reports.						
Hazard/Threat Addressed	Fire (Urban and Wildland), HAZMAT						
Affected Jurisdiction(s)	Wells County and Incorporated Jurisdictions						
Project Status	Ongoing and Continue						
Priority	High						
Responsible Agency	Emergency Services						
Partners	Emergency Management						
Completion Timeframe	1 year			Cost	Staff-time only		
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
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Wells County LEOP Wells County Mitigation Plan Wells County THIRA		Capability Assessment, Hazard History, Risk Assessment			Identify fire department personnel capable of digitizing records. Select preferred digital method (excel, specified program or software).		

Wells County Project AT-8: Establish Permanent Maintenance System for Storm Water Systems/Drainage Ditches to Reduce and/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. The county road department and city public works departments already has a schedule for maintaining storm water systems/drainage ditches but needs to be converted to a written document for continuity purposes.					
Hazard/Threat Addressed		Drought, Flood (Overland), Infectious Disease, Severe Summer Weather, Severe Winter Weather, Wildland Fire					
Affected Jurisdiction(s)		Wells County and Incorporated Jurisdictions					
Project Status		Ongoing and Continue					
Priority		High					
Responsible Agency		County Commission, City Council(s), Public Works					
Partners		Emergency Management, Emergency Services, DWR, NRCS, Public Health, Water Resource District					
Completion Timeframe		End of 2023	Cost	Staff-time			
Funding Source		Local 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
5	5	4	4	4	5	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>		
Wells County LEOP Wells County Mitigation Plan Wells County THIRA		Capability Assessment, Hazard History, Risk Assessment			Development of system by county public works. Approval and adoption by county commission and water resource district board. Include as annex in local emergency operations plan.		

Wells County Project AT-9: Establish a “Safe Send” Site/Drop-Off Point for Disposal of Hazardous Materials.

Description/Benefit		<p>Surplus hazardous materials need to be disposed of properly to mitigate the release of hazardous materials and subsequent fires or infectious diseases.</p> <p>Wells County should work with a surrounding municipal landfill to include procedures for disposal in the county’s hazardous materials response plan. Specific attention should be paid to the waterway east of the city of Fessenden’s landfill to ensure no contamination occurs.</p> <p>A “Safe Send” site is available for fungicides, herbicides, and pesticides through the N.D. Dept. of Agriculture. There are multiple sites throughout the state.</p>					
Hazard/Threat Addressed		Drought, Fire, Hazardous Material Release, Infectious Disease (All)					
Affected Jurisdiction(s)		Wells County and Incorporated Jurisdictions					
Project Status		New/Ongoing and Continue					
Priority		High					
Responsible Agency		County Commission, City Council(s), Public Works					
Partners		DWR, Emergency Management, Emergency Services, NRCS, Water Resource District					
Completion Timeframe		End of 2023	Cost	Staff-time			
Funding Source		Local budgets. Research local fee structure to address disposal costs.					
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	3	3	5	5	5	31
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>			<u>Plan Element Utilized</u>			<u>Process for Integration</u>	
Wells County LEOP Wells County Mitigation Plan Wells County THIRA			Capability Assessment, Hazard History, Risk Assessment			Work with local emergency services to identify development of site.	

Wells County Project AT-10: Install Homeland Security Measures at Critical Facilities and Infrastructure.

Description/Benefit		<p>The Wells County Courthouse, emergency services buildings and the hospital, and public schools are critical facilities, and utility and transportation infrastructure are vulnerable to adversarial threats. Installation of (but not limited to) access control measures, alarm systems, cybersecurity enhancements, door alarms, door locks, enhanced lighting, security fencing, motion-detecting systems, security camera surveillance systems, and threat-proof building materials are needed to mitigate adversarial threats.</p> <ul style="list-style-type: none"> • Access Control Systems (Bollards): St. Aloisius Hospital & Medical Center front door, generator and propane tank, Wells County Public Health • Alarm Systems: • Door Access Control Systems: KTL Building • Security Camera Surveillance Systems: Wells County Public Health • Security Fencing: • Security Lighting: Wells County Fairgrounds, City of Fessenden • Threat-Proof Doors and Windows: Fessenden-Bowdon Public School (windows), Harvey Public School 					
Hazard/Threat Addressed		Civil Disturbance; Criminal, Terrorist, or Nation/State Attack, Fire (Urban), Transportation Incident (all)					
Affected Jurisdiction(s)		Wells County and Incorporated Jurisdictions					
Project Status		New					
Priority		Very High					
Responsible Agency		County Commission, City Council(s), Emergency Management, Emergency Services, Public Works, Medical Service Providers					
Partners		Dept. Homeland Security, NDDDES, private contractors					
Completion Timeframe		Ongoing	Cost		Project-specific		
Funding Source		Local budgets and department staff and resources. State Homeland Security Grants. FEMA. RD. USDA.					
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	3	4	31
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Wells County LEOP & Mitigation Plan Wells County THIRA		Capability Assessment, Hazard History, Risk Assessment			Develop scope of work and procure bids/quotes. Apply for grant funding. Select contractor. Receive EHP approval. Execute.		

Wells County Project AT-11: Support the N.D. Dept. of Water Resources Risk Mapping, Analysis, and Planning (RISK MAP).

Description/Benefit		The N.D. Dept. of Water Resources received funding from the Federal Emergency Management Agency (FEMA) to produce new and/or update flood maps for Wells County and incorporated jurisdictions. Workshops began Fall 2017. Lack of participation will result in no opportunity to map unmapped areas or share risk knowledge and update existing maps.					
Hazard/Threat Addressed		Drought, Flood (Overland), Infectious Disease, Severe Summer Weather, Severe Winter Weather					
Affected Jurisdiction(s)		Wells County and Incorporated Jurisdictions					
Project Status		New					
Priority		Very High					
Responsible Agency		DWR					
Partners		County Commission, City Council(s), Emergency Management, Emergency Services					
Completion Timeframe		End of 2025	Cost	Staff-time			
Funding Source		FEMA					
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	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Wells County LEOP Wells County Mitigation Plan Wells County THIRA		Capability Assessment, Hazard History, Risk Assessment			Follow direction from the N.D. Dept. of Water Resources		

Wells County Project EO-1: Conduct Education and Outreach to Improve Household Disaster Readiness and Preparedness.

Description/Benefit		Continued education and outreach to keep households and vulnerable populations ready in case of a disaster using websites, social media, local media, utility inserts, mailings, etc. Develop new websites or communication outlets where necessary. 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, Tier II, among others. Additional attention should be given to flooding, hazardous materials, severe weather, fire, truck routes, and safe routes to school. Outreach and attention should be given to mass notification systems.					
		<p>Existing websites: Wells County, City of Harvey, Fessenden-Bowdon Public School, Harvey Public School, Wells County Public Health, NDSU Extension/Wells County, St Aloisius Hospital & Medical Center</p> <p>Existing social media: Wells County Sheriff’s Office, Wells County Road Department, Wells County Emergency Management, Wells County Public Health, NDSU Extension/Wells County, Bowdon Ambulance, Fessenden Ambulance, Harvey Ambulance, Bowdon Fire Department, Fessenden Fire Department, Harvey Fire Department, Sykeston Fire Department, St Aloisius Hospital & Medical Center</p> <p>Develop new: Pursue additional social media platforms such as Instagram and Snapchat, where appropriate.</p>					
Hazard/Threat Addressed		All Hazard/Threats					
Affected Jurisdiction(s)		Wells County and Incorporated Jurisdictions					
Project Status		Ongoing and Continue/New					
Priority		Very High					
Responsible Agency		County Commission, City Council(s), Emergency Management, Emergency Services, Public Schools					
Partners		Extension, Media, Medical Services Providers, Public Health, Public Utilities					
Completion Timeframe		Ongoing		Cost	\$1,000 to 2,000 annually		
Funding Source		Local resources. State and federal grants. Public Utilities.					
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	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Wells County LEOP Wells County Mitigation Plan Wells County THIRA		Capability Assessment, Hazard History, Risk Assessment			Develop and review by appropriate jurisdictions or agencies. Review by state’s attorney. Distribute.		

Wells County Project EO-2: Increase Awareness of Methods for Prevention of Infectious Disease & Pest Infestations.

Description/Benefit	<p>Make the public aware of the risk of infectious diseases and methods for prevention in people, animals and crops for economic impact. Methods should focus on young and elderly populations (vulnerable and all populations), handwashing, influenza preparedness, and strategies used in agriculture-based economies such as pesticides, fungicides, herbicides and insecticides.</p> <p>New and future awareness should include social distancing and other measures to prevent the spread of infectious diseases.</p>		
Hazard/Threat Addressed	Infectious Disease (All)		
Affected Jurisdiction(s)	Wells County and Incorporated Jurisdictions		
Project Status	New/Ongoing and Continue		
Priority	High		
Responsible Agency	Extension, Public Health, Weed Board, public information officers		
Partners	Emergency Management, Emergency Services, Dept. of Natural Resources, FSA, NDDA/State Veterinarian, NDDH, Medical Services Providers, RD, Stockmen’s Association, USDA		
Completion Timeframe	Ongoing	Cost	Project-specific
Funding Source	Extension. Public Health. Local, state and federal budgets or 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	5	5	5	5	35

Integration of Mitigation Plan Requirements into Local Planning Mechanisms

<u>Planning Mechanisms Utilized</u>	<u>Plan Element</u>	<u>Process for Integration</u>
Public Health (all plans) Wells County LEOP Wells County Mitigation Plan Wells County THIRA	Capability Assessment, Hazard History, Risk Assessment	Development by Public Health/respective agency. Approval by county commission, city council(s) and emergency management. Distribute.

Wells County Project EO-3: Increase Awareness of Drought Tolerant Practices and Soil Conservation Methods in Farming and Ranching, and Incorporated Jurisdictions.

Description/Benefit	Make the public aware of crop programs, drought tolerant practices and soil conservation 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. A public awareness campaign for water conservation can increase awareness of drought.						
Hazard/Threat Addressed	Drought, Fire (Wildland), Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	Wells County and Incorporated Jurisdictions						
Project Status	Ongoing and Continue/New						
Priority	Medium						
Responsible Agency	Extension, NRCS						
Partners	Emergency Management, Emergency Services, Wells County Soil Conservation District, Media, Weed Board, USDA (FSA)						
Completion Timeframe	Ongoing	Cost	Contact Extension Office				
Funding Source	Rural Development. NRCS. Local resources. State and federal grants. North Dakota State University.						
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	5	5	5	35
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) Wells County LEOP Wells County Mitigation Plan Wells County THIRA		Capability Assessment, Hazard History, Risk Assessment			Development by NDSU Extension. Approval by county commission, city council(s) and emergency management. Distribute.		

Wells County Project EO-4: 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	<p>Make the public aware of the risk of shortage of critical materials and/or infrastructure and encourage citizens to be self-sufficient. Use Grant Counties ‘Are You Prepared?’ brochure developed by Wells County Public Health.</p> <p>Educate residents on the importance of an emergency kit and household emergency response plan, shelter-in-place, stocking of food and medical supplies, fuel for heating, backup power generation. Education should also focus on understanding risks involved with natural hazards and manmade threats in respective communities.</p>						
Hazard/Threat Addressed	All						
Affected Jurisdiction(s)	Wells 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 Council(s), Extension, Food Pantries, Media, NDDDES, NDDHHS, 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.						
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	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Wells County LEOP Wells County Mitigation Plan State Vulnerable Populations Plan Wells County Public Health (all plans) Wells County THIRA		Capability Assessment, Hazard History, Risk Assessment			Development by Emergency Management, Public Health, Public Schools, and Public Utilities. Approval by county commission, city council(s), school boards. Distribute.		

Wells County Project EO-5: Conduct Continuous Preventative Education to Increase Awareness of Cyberattack Threats.

Description/Benefit		<p>Make the 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. Specific attention should be paid to the framework developed and included in the K20W Initiative. Specific information should be developed for incorporated cities to protect utility infrastructure (i.e., SCADA Systems, etc.)</p> <p>Specific education opportunities should be made available to staff at the Wells County Courthouse, St. Aloisius Hospital & Medical Center, B.M. Hanson Elementary School, Harvey High School, Fessenden-Bowdon Public School, city halls</p>					
Hazard/Threat Addressed		Cyberattack					
Affected Jurisdiction(s)		Wells County and Incorporated Jurisdictions					
Project Status		New					
Priority		Very High					
Responsible Agency		Wells County and Public Schools in partnership with NRG and NDIT					
Partners		County Commission, City Council(s), Emergency Management, Emergency Services, Public Schools					
Completion Timeframe		Ongoing	Cost		Project-specific		
Funding Source		Local budgets. State and federal grants. NDIT. Homeland Security Grant Program.					
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	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Wells County LEOP Wells County Mitigation Plan Wells County THIRA		Capability Assessment, Hazard History, Risk Assessment			Development by Wells County Office of Emergency Management, NDIT, NRG, and public schools. Approval by county commission, city council(s), emergency management, school board Distribute.		

Wells County Project EO-6: Assist in the Annual Update of Wells County Public Health’s Strategic Plan.

Description/Benefit	Wells County Public Health (WCPH) provides public health services to Wells County. The strategic plan for WCPH is required to be updated on an annual basis. The county should assist WCPH in this update where possible.						
Hazard/Threat Addressed	Infectious Disease (All)						
Affected Jurisdiction(s)	Wells County and Incorporated Jurisdictions						
Project Status	New						
Priority	High						
Responsible Agency	Public Health						
Partners	Emergency Management, Emergency Services, Medical Services Providers						
Completion Timeframe	Ongoing	Cost	Staff time and printing				
Funding Source	Public Health. Local, 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	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Public Health (all plans) Wells County LEOP Wells County Mitigation Plan Wells County THIRA		Capability Assessment, Hazard History, Risk Assessment			Development by Public Health. Approval by board. Distribute.		

Wells County Project EO-7: Assist Wells County Public Health in Annual Updates to the Wells County Vaccination Outreach Plan and Perform Outreach.

Description/Benefit		<p>The influenza vaccination rate for school-aged children in Wells County needs to be increased. Develop outreach with the goal of increasing this rate to 100 percent. Recent immunization funding from the N.D. of Health and Human Services will assist public health in increasing immunizations, creating a written outreach plan, and identify strategies to improve vaccine confidence in the community.</p> <p>It should be noted that the overall goal of 100 percent influenza vaccination for school-aged children is an objective/goal of Wells County. However, the rights of individual medical freedom and parent’s rights for the health of their children supersedes any local government objective/goal.</p> <p>All public schools in Wells County follow the immunization requirements set forth by the N.D. Dept. of Health and Human Services. Exemptions are available to any parent or student who wishes to obtain one.</p>					
Hazard/Threat Addressed		Infectious Disease (only those that are vaccine preventable)					
Affected Jurisdiction(s)		Wells County, incorporated jurisdictions and unincorporated jurisdictions. Specific attention paid to communities with schools, care centers/nursing homes, higher education, and institutionalized populations.					
Project Status		Ongoing and Continue/New (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
2	5	5	2	5	5	5	29
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Wells County LEOP Wells County Mitigation Plan Wells County THIRA Wells County Public Health (all plans)		Capability Assessment, Hazard History, Risk Assessment			Developed by Wells County Public Health. Approval by board, public schools and emergency management. Distribute.		

Wells County Project EO-8: Develop and 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 quality. The program should focus on stock dams, well water, streams, and watersheds. Crops should be checked for nitrates.					
Hazard/Threat Addressed		Dam Failure, Drought, Flood, Infectious Disease, Severe Summer Weather, Severe Winter Weather					
Affected Jurisdiction(s)		Wells County and Incorporated Jurisdictions					
Project Status		New					
Priority		High					
Responsible Agency		Extension					
Partners		County Commission, City Council(s), Emergency Management, Emergency Services, Wells County Soil Conservation District, Producers, Media, N.D. Stockmen’s Association (NDSA), Weed Board, USDA (FSA, NRCS)					
Completion Timeframe		1 year. Ongoing and Continue.	Cost	\$3,000.00			
Funding Source		NDSU Extension/Wells County. County budget. Grants (pay for water and feed test equipment).					
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	5	5	5	35
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) Wells County LEOP Wells County Mitigation Plan Wells County THIRA		Capability Assessment, Hazard History, Risk Assessment			Development by NDSU Extension/Wells County. Review and approval by county commission. Updating of local plans.		

Wells County Project EO-9: Conduct Education and Outreach on Fire Safety and Prevention, Burn Restrictions, State Fire Indexes, and Regional/State Burning Regulations and Restrictions.

Description/Benefit	<p>Make the public aware of methods to remain safe from risk of urban fire and wildland 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. Evaluate and/or create defensible space around structures to include removing debris accumulation with special attention given to Tier II locations. Promote Firewise Safety practices.</p> <p>Educate the public on burn restrictions and state fire indexes. Reduce the risk of fire hazard from outdoor burning by residents and provide means of communication. Explore surface water access options for fire suppression. https://ndresponse.gov/burn-ban-restrictions-fire-danger-maps</p>						
Hazard/Threat Addressed	Drought, Fire (Wildland), Hazard Material Release, Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	Wells County and Incorporated Jurisdictions						
Project Status	Ongoing and Continue/New (new to the mitigation plan, but has always been executed by fire departments)						
Priority	High. Primarily summer but can occur in spring and fall.						
Responsible Agency	County Commission, Emergency Management, Emergency Services						
Partners	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.						
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	3	3	5	5	29
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Wells County LEOP Wells County Mitigation Plan Wells County THIRA		Capability Assessment, Hazard History, Risk Assessment			Development by Emergency Management and Emergency Services. Approval by county commission. Distribute.		

Wells County F-1: Strengthen and Expand 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"> • Create and implement impact fees for new development. • Restructure and improve building permit fees to be a percentage of project cost. • Establish Capital Improvement Fund/Plan, where possible. • Restructure and increase utility fees (water, sewer) based on projected future infrastructure maintenance costs and necessary capital improvements. • Research additional revenue generators such as an electricity utility fee, wheel tax, etc. • Expand role of local economic development to generate more revenue through grant funding, loans funds, community endowment, etc. • Create revenue stream and allocate resources to invest in equipment and emergency services capabilities. • Pursue new grant opportunities, where possible. 						
Hazard/Threat Addressed	All						
Affected Jurisdiction(s)	Wells County and Incorporated Jurisdictions						
Project Status	Ongoing and Continue						
Priority	Very High						
Responsible Agency	County Commission, City Council(s)						
Partners	Emergency Management, Emergency Services, NDAC0, NDLC, Planning & Zoning, Public Utilities						
Completion Timeframe	Ongoing	Cost		Staff-time			
Funding Source	Local budgets and staff time.						
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
1	5	5	3	3	4	5	26
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
City Council(s) and County Commission Planning Commission		Capability Assessment, Hazard History, Risk Assessment			Research effectiveness. Approval and adoption by county commission and city council(s).		

Wells County Project PR-1: Assure Wells 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.					
		Update plan on a continuing basis between plan update grant applications. See Chapter 10 and Appendix 8 of this plan.					
Hazard/Threat Addressed		All					
Affected Jurisdiction(s)		Wells County and Incorporated Jurisdictions					
Project Status		New					
Priority		Very High					
Responsible Agency		County Commission, Emergency Management					
Partners		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.					
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	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<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 council(s). Approval NDDDES and FEMA.		

Wells County PR-2: Update/Expand Existing and/or Create New Planning and Regulatory Capabilities to Address Existing and New Development.

Description/Benefit		<p>Build the planning and regulatory capability of Wells County and incorporated jurisdictions by updating existing and/or expanding and create new plans, policies, and ordinances. To ensure new and existing structures adhere to building standards to withstand impacts from hazards. Energy development (oil and gas) in the western portions of the state may lead to economic and population growth in the future. Specific research should be conducted to address cybersecurity, drought management, flood ordinances and management, grain bins, hazardous materials, impact fees, man camps, mitigation, rodent control, site plan review requirements, storm water management, and water conservation.</p> <p>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. Develop and implement a county-wide computer security system/policy.</p> <p>A list of plans, policies, codes and ordinances needing to be updated or created for Wells County and incorporated jurisdictions are bolded in text narratives and are found in Chapter 7, Capability Assessment.</p> <p>Wells County should work with St. Aloisius Hospital & Medical Center to update the Continuity of Operations Plan and Mass Casualty Plan, and update zoning for HAZMAT sites and industrial development not conducive to current land uses.</p> <p>Wells County should develop subdivision ordinances for permanent rural residential development.</p>					
Hazard/Threat Addressed		All					
Affected Jurisdiction(s)		Wells County and Incorporated Jurisdictions					
Project Status		Ongoing and Continue					
Priority		High					
Responsible Agency		County Commission, City Council(s), Planning & Zoning					
Partners		Emergency Management, Emergency Services, NDACo, NDDDES, NDLC, Public Works, RD					
Completion Timeframe		Ongoing	Cost	\$0 to \$100,000 / Staff-time			
Funding Source		Local budgets. Local, 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
3	5	4	3	3	4	5	27
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<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 council(s).		

Wells County PR-3: Encourage Jurisdictional Participation/Enroll 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)	Cities of Bowdon, Cathay, Hamberg, Hurdsfield						
Project Status	Ongoing and Continue						
Priority	High						
Responsible Agency	County Commission, City Council(s), Emergency Management						
Partners	DWR, Planning & Zoning, Water Resource District						
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
4	5	5	3	4	4	5	30
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Flood Ordinances Wells County LEOP, Flood Annex Wells County Mitigation Plan Wells County THIRA National Flood Insurance Program (NFIP)		Capability Assessment, Hazard History, Risk Assessment			Approval and adoption by county commission and city council(s).		

Wells 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 Wells County and incorporated jurisdictions meet or exceed the NFIP and/or to prepare for enrollment in the NFIP.						
Hazard/Threat Addressed	Flood (overland and riverine), Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	Wells County and the cities of Fessenden, Harvey, and Sykeston. The cities of Bowdon, Cathay, Hamberg, Hurdsfield (once enrolled).						
Project Status	Ongoing and Continue						
Priority	Very High						
Responsible Agency	County Commission, City Council(s), Emergency Management, Planning & Zoning						
Partners	Emergency Services, NDACo, NDDes, 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
4	5	5	4	4	5	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>		
Flood Ordinances Wells County LEOP, Flood Annex Wells County Mitigation Plan Wells County THIRA National Flood Insurance Program		Capability Assessment, Hazard History, Risk Assessment			Approval and adoption by county commission and City Council(s).		

Wells County PR-5: Create Post-Disaster Debris Management Plan and Update on an Annual Basis.

Description/Benefit		Provide temporary staging site for disposal of waste from structures to improve resiliency and recovery efforts and maintain quality of life. Establishment of a management plan increases disaster reimbursement from FEMA by five percent.					
Hazard/Threat Addressed		All					
Affected Jurisdiction(s)		Wells County and Incorporated Jurisdictions					
Project Status		Ongoing and Continue					
Priority		Medium					
Responsible Agency		County Commission, City Council(s), Emergency Management, Planning & Zoning, Public Works					
Partners		NDACo, NDDes, NDLC, Public Health, Public Utilities, Water Resource District					
Completion Timeframe		1 year. Annual review.	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
5	5	5	4	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>		
Wells County LEOP (Appendix) Wells County Mitigation Plan Wells County THIRA Planning Commission		Capability Assessment, Hazard History, Risk Assessment			Organize planning committee and create plan. Approval and adoption by county commission and city council(s). Update annually.		

Wells County PR-6: Update Bovine Emergency Response Plan (BERP) Annually.

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)		Wells County and Incorporated Jurisdictions					
Project Status		New					
Priority		Medium					
Responsible Agency		Extension, N.D. State Vet Office, local producers and/or veterinarians					
Partners		Emergency Management, Emergency Services, Weed Board, wrecker services					
Completion Timeframe		1 year	Cost	\$75 to \$100 per person. Staff time.			
Funding Source		Central Grasslands Research Extension Center. N.D. Beef Commission. 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
5	5	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Wells County LEOP Wells County Mitigation Plan Wells County THIRA		Capability Assessment, Hazard History, Risk Assessment			Develop draft plan and formally adopt by county commission. Integrate into local emergency services response protocols.		

Wells County PR-7: Update Flood Operations/Management Annex in the Wells County Local Emergency Operations Plan (LEOP) Annually.

Description/Benefit	Flooding impacts Wells County on an annual basis to varying degrees of severity. The Flood Operations/Management Annex in the Wells County Local Emergency Operations Plan should be updated annually based on the flooding event of the preceding year.						
Hazard/Threat Addressed	Dam Failure, Flood, Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	Wells County and Incorporated Jurisdictions						
Project Status	New						
Priority	Very High						
Responsible Agency	County Commission, City Council(s), Emergency Management, Emergency Services, Planning & Zoning, Public Works						
Partners	NDDDES, Public Health, Public Utilities, DWR, Water Resource District, VOAD.						
Completion Timeframe	1 year. Annual updates.	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
5	5	5	3	3	5	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>		
Wells County LEOP, Flood Annex Wells County Mitigation Plan Wells County THIRA Planning Commission		Capability Assessment, Hazard History, Risk Assessment			Utilize the Wells County LEPC or Mitigation Plan Steering Committee to update annually. Approval and adoption by county commission and city council(s).		

Wells County Project I-1: Assure Continued Monitoring and Maintenance of Cathay Dam, Harvey Dam, and Sykeston Dam in Wells County.

Description/Benefit		To protect human life and property from dam failures. Eliminate the possibility of failure, like what almost occurred at the Harvey Dam in 2009 and 2011, and Sykeston Dam in 2011 and 2019.					
		<u>EAPs and contact information should be updated on an annual basis for each respective dam.</u>					
		See Chapter 4.4 Dam Failure for additional information on high and medium hazard dams in Wells County. A full list of dams in Wells County can be found in the hazard history for the county on a disc at the beginning of this plan.					
Hazard/Threat Addressed		Dam Failure, Flood, Severe Summer Weather, Severe Winter Weather					
Affected Jurisdictions		Wells County and Incorporated Jurisdictions					
Project Status		Ongoing and Continue					
Priority		Very High					
Responsible Agency		Emergency Management					
Partners		County Commission, City Council(s), Engineering, Public Works					
Completion Timeframe		Ongoing.		Cost		To be determined. Project specific.	
Funding Source		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	5	5	5	5	5	35
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element Utilized</u>			<u>Process for Integration</u>		
Wells County LEOP Wells County Hazard Mitigation Plan Wells County THIRA		Capability Assessment, Hazard History, Risk Assessment, dam failure statistics			Work with state agencies to incorporate monitoring and maintenance schedules into local planning mechanisms.		

Wells County Project I-2: Retrofit and/or Upgrade Bridges, Culverts, Roads and/or Grade Raises, Stormwater Pipes, and Underpasses to Withstand Natural Hazards and Adversarial Threats to Prevent Blockage to Maintain Access for Emergency Services.

Description/Benefit		Increase resiliency of bridges, culverts and railroads, roads, and stormwater pipes to maintain transportation to assure economic vitality and access for emergency services. A detailed description of each bridge, culvert, railroads, roads, and stormwater pipes is shown on the following page and in Chapter 4.4, Flood.					
Hazard/Threat Addressed		Drought, Fire (Wildland), Flood (overland and riverine), Hazardous Material Release, Severe Summer Weather, Severe Winter Weather					
Affected Jurisdiction(s)		Wells County and Incorporated Jurisdictions					
Project Status		Ongoing and Continue/New					
Priority		Very High					
Responsible Agency		County Commission, FHWA, FRA, NDDOT, Public Works, Water Resource District					
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.					
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	4	2	3	28
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Wells County LEOP Wells County Mitigation Plan Wells 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, township boards, and City Council(s).		

Wells County Project I-2: Retrofit and/or Upgrade Bridges, Culverts, Railroads, Roads and/or Grade Raises, Stormwater Pipes, and Underpasses to Withstand Natural Hazards and Adversarial Threats to Prevent Blockage to Maintain Access for Emergency Services.

Bridges: A list of bridges can be obtained by contacting the Wells County Road Department.

Culverts: The Wells County Emergency Management and Road Department's indicated that the 2009, 2010, 2011, 2013 (twice), 2019 (twice), 2020 (twice) flood impacted all culverts in the county. Due to federal assistance at the time, impacted culverts were upgraded. As such, no culverts were identified for inclusion in this project.

Road Grade Raises: A list of road grade raises can be obtained by contacting the Wells County Road Department.

Roads: Warrington St. access into the city of Bowdon from N.D. Highway 200

Underpass: N.D. Highway 15 in City of Fessenden.

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Wells County Project I-3: Construct New Storm Shelters/Community Safe Rooms or Retrofit Existing Structures to Reduce and/or Eliminate the Risk to Vulnerable Populations and the Public.

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 jurisdictions currently lacking a storm shelter/safe room. Procure shelter supplies where necessary. More information on community shelters can be found through the following link: https://www.fema.gov/media-library/assets/documents/5090					
		<ul style="list-style-type: none"> • Wells County: Location in south-central portion of the county for use by rural residents/farmers. This area of the county has a strong population base and needs protection from severe weather. • Cathay (fire hall), Hurdsfield and Sykeston (Parish Hall) • City of Fessenden/Wells County: Wells County Fair Grounds 					
		Purchased cots are stored at Wells County Courthouse, Bowdon Fire Hall, Harvey Armory/City Hall/Fire Hall, Sykeston Fire Hall					
Hazard/Threat Addressed		All					
Affected Jurisdiction(s)		Wells County and Incorporated Jurisdictions					
Project Status		Ongoing and Continue					
Priority		High					
Responsible Agency		Emergency Management, Emergency Services, Public Health					
Partners		County Commission, City Council(s), NDDES, Red Cross, Social Services, private housing/community owners,					
Completion Timeframe		5+ years	Cost	\$75,000.00 to \$150,000.00 per shelter			
Funding Source		Local, state and federal grants. FEMA’s Building Resilient Infrastructure and Communities (BRIC) Grant Program.					
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	5	4	4	33
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Wells County LEOP Wells County Mitigation Plan Wells County THIRA		Capability Assessment, Hazard History, Risk Assessment			Approval by county commission, City Council(s), and private house/community owners		

Wells County Project I-4: Conduct Hydrology/Engineering Study for Pipestem Creek and Rocky Run Creek to Identify Effective Flood Control Measures and Drainage Improvements.

Description/Benefit		<p>Construction of detention/retention ponds, floodwalls, berms, revetments or bioengineered bank-stabilization techniques to slow runoff of overland flooding from heavy rains and snowmelt, and flood waters from riverine flooding. Detention/retention ponds provide controlled release of water and reduce/eliminate areas and structures from being inundated with flooding.</p> <p><i>No specific areas or sites. Wells County Water Resource District board would like to see both bodies of water engineered from the top to the bottom to determine if culvert sizes are adequate to prevent roads washing out during high water events.</i></p> <p><i>Extensive research has been conducted on Rocky Run. Some research on Pipestem Creek has been completely by the city of Sykeston.</i></p>					
Hazard/Threat Addressed		Dam Failure, Flood (riverine and overland), Severe Summer Weather, Severe Winter Weather					
Affected Jurisdiction(s)		Wells County and Incorporated Jurisdictions (townships)					
Project Status		Ongoing and Continue					
Priority		High					
Responsible Agency		County Commission, Water Resource District					
Partners		City Council(s), Emergency Management, Emergency Services, DWR, Public Works, NDDDES					
Completion Timeframe		2-3 years			Cost	Ongoing	
Funding Source		Local, 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
1	4	5	2	3	2	3	20
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>			<u>Plan Element</u>			<u>Process for Integration</u>	
Wells County LEOP Wells County Mitigation Plan Wells 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. Receive funding through NRCS.	

Wells County Project I-5: Support the Wells County, North Dakota Water Resource District Board Capital Improvement Plan.

Description/Benefit	<p>In 2009 and 2011, substantial flooding from spring melt threatened the integrity of the Harvey Dam. Canadian-Pacific (CP) Railway has a wooden span covered with earth material adjacent to the dam. If a failure were to occur, CP would lose the ability to conduct business on this railroad line for an estimated six months to a year.</p> <p>The N.D. Dept. of Water Resources is planning to reclassify the Harvey Dam to High-Hazard by the end of 2023. If the dam were to be classified as high-hazard, it would need to be retrofitted/upgraded to withstand a 1,000-year event.</p> <p>Apex Engineering in Bismarck is the contracted engineer for the Wells County, North Dakota Water Resource District and can be contacted to obtain further detailed information.</p> <p>The WRD has drain maintenance plans and culvert upgrade plan.</p>						
Hazard/Threat Addressed	Flood, Infectious Disease, Severe Summer Weather, Severe Winter Weather						
Affected Jurisdiction(s)	Wells County and Incorporated Jurisdictions						
Project Status	Ongoing and Continue/New						
Priority	Very High						
Responsible Agency	County Commission, Water Resource District						
Partners	Emergency Management, Emergency Services, DWR						
Completion Timeframe	TBD			Cost	Project specific		
Funding Source	Local budgets. DWR. WRD. FEMA’s BRIC or HMGP Grant Programs.						
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	4	3	5	2	3	26
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Wells County LEOP Wells County Mitigation Plan Wells County THIRA Wells County Water Resource District Board Capital Improvement Plan		Capability Assessment, Hazard History, Risk Assessment			Commission further studies or construction estimates through a formal bidding process. Select contractor(s). Apply for grant funding to execute or budget in local budgets.		

Wells County Project I-6: Remove and Reposition Ineffective Living Snow Fences at Strategic Points to Maintain Visibility and/or Install New Living Snow Fences.

Description/Benefit		Removal of trees and vegetation too close to sides of roads and flatten back slopes. Replace and plant new trees in appropriate areas to reestablish living snow fences. Figures on the following page illustrate locations of concern. Remove Install New: City of Fessenden near 4 th Ave and 2 nd St. near the school, Warrington St. access into the city of Bowdon from N.D. Highway 200					
Hazard/Threat Addressed		Infectious Disease, Severe Summer Weather, Severe Winter Weather, Transportation Incident					
Affected Jurisdiction(s)		All					
Project Status		Ongoing and Continue					
Priority		Low					
Responsible Agency		Road Department					
Partners		Emergency Management, Emergency Services, NRCS, NDGF, USFS					
Completion Timeframe		Ongoing			Cost	Ongoing	
Funding Source		Local budgets and department staff and resources. NRCS.					
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	3	3	5	29
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>		<u>Plan Element</u>			<u>Process for Integration</u>		
Wells County LEOP Wells County Mitigation Plan Wells 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. Receive funding through NRCS.		

Wells County Project I-7: Retrofit and/or Expand Existing Storm Water and Sanitary Sewer Systems in Incorporated Cities to Increase Capacity to Reduce and/or Eliminate Occurrences of Overland Flooding.

Description/Benefit		Improve drainage to reduce or eliminate flooding and related damage to property and critical facilities and infrastructure. Reduce or eliminate outages of power and sanitary sewers. Sykeston: Dredging and upgrading of sewer lines.					
Hazards Addressed		Flood (overland), Severe Summer Weather, Severe Winter Weather					
Affected Jurisdiction(s)		Wells County and Incorporated Jurisdictions					
Project Status		New					
Priority		High					
Responsible Agency		City Council(s)					
Partners		Emergency Management, Planning & Zoning, Public Works, NDAC0, NDDDES, NDLC, Regional Council					
Completion Timeframe		5 to 10 years			Cost	Project-specific	
Funding Source		Local, 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
Integration of Mitigation Plan Requirements into Local Planning Mechanisms							
<u>Planning Mechanisms Utilized</u>			<u>Plan Element Utilized</u>			<u>Process for Integration</u>	
Wells County LEOP Wells County Mitigation Plan Wells County THIRA			Capability Assessment, Hazard History, Risk Assessment			Approval by county commission and city councils	

5	5	5	4	5	1	3	28
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Wells County Project I-7: Upgrade Existing and/or Construct New Fire Halls/Community Centers in Incorporated Jurisdictions.

Description/Benefit	The size of existing facilities does not provide adequate space for emergency services to facilitate an appropriate emergency operations center and store equipment. Inadequate workspace for emergency services personnel and supportive staff is also an issue. A combination of this project with Project I-3 would provide backup power generation improving county and city sheltering capabilities.						
Hazards Addressed	All						
Affected Jurisdiction(s)	Cathay, Fessenden, Harvey						
Project Status	New						
Priority	High						
Responsible Agency	City Council(s) and Emergency Services						
Partners	County Commission, Emergency Management, Planning & Zoning, Public Works, NDACo, NDDES, NDLC, Regional Council, RD						
Completion Timeframe	5+ years	Cost	Project-specific				
Funding Source	Local district fees or updating of existing taxes. State and federal grants. CBDG program. Private loans.						

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	4	4	5	1	3	26

Integration of Mitigation Plan Requirements into Local Planning Mechanisms

<u>Planning Mechanisms Utilized</u>	<u>Plan Element Utilized</u>	<u>Process for Integration</u>
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<p>Wells County LEOP Wells County Mitigation Plan Wells County THIRA Wells County Water Resource District Capital Improvement Plan</p>	<p>Capability Assessment, Hazard History, Risk Assessment</p>	<p>Apply for engineering and design funding. Develop specifications. Pursue grant funding or low-interest loans. Approval by city councils.</p>
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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 Eddy & Wells Counties 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 Eddy & Wells Counties 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 Eddy & Wells Counties 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.

7.3 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 Eddy & Wells Counties, 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

Building Resilient Infrastructure and Communities (BRIC) Grant Program. The BRIC program, Formerly Pre-Disaster Mitigation (PDM) Grant 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 BRIC program.

BRIC supports states, local communities, tribes and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards. BRIC funds are distributed from FEMA to the state. For more information, visit <https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities>

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 Native American 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 National Flood Insurance Program (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.

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.

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

Community Development Block Grants (CDBG). The U.S. Dept. of Commerce administers the Community Development Block Grants (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, road 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. For more information, visit https://www.hud.gov/program_offices/comm_planning/CDBG

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 for purchase. For more information, visit <http://www.gsa.gov/portal/category/21045>

Hazardous Materials Emergency Preparedness Grant (HMEP). The HMEP Grant funds are passed through to local emergency management offices and HAZMAT teams having functional and active LEPC groups. For more information, visit <http://www.phmsa.dot.gov/hazmat/grants>

National Oceanic and Atmospheric Administration (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 education institutions and organizations in the United States. For more information, visit <http://www.noaa.gov/office-education.grants>

Natural Resources Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP). The Environmental Quality Incentives, 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 EQIP. Eligible land includes cropland, rangeland, pastureland, non-industrial private forestland and other farm or ranch lands. EQIP is another funding mechanism for landowner fuel reduction projects. For more information, visit <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip/>

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

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>

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

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/>

8. Jurisdictions

This chapter serves as a mini “Plan Within the Plan” and includes the following information for each incorporated city jurisdiction in Eddy & Wells Counties, North Dakota:

- 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 Eddy & Wells Counties are shown in Chapter 4, Profile and Inventory.

The incorporated cities in Eddy & Wells Counties, North Dakota are shown alphabetically in the following chapter.

Eddy County

- 8.1: City of New Rockford
- 8.2: City of Sheyenne

Wells County

- 8.3: City of Bowdon
- 8.4: City of Cathay
- 8.5: City of Fessenden
- 8.6: City of Hamberg
- 8.7: City of Harvey
- 8.8: City of Hurdsfield
- 8.9: City of Sykeston

10. Plan Maintenance

Mitigation planning for Eddy County, North Dakota and Wells 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

The emergency manager for Eddy County and Wells County, and the LEPC for each county, 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 Eddy & Wells Counties.**
- **The annual reports are due back to the 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 Eddy County Commission and Wells 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 Eddy County Courthouse in the city of New Rockford, the Wells County Courthouse/KTL Building in the city of Fessenden, and at the city halls in each of the incorporated jurisdictions. During plan updates, the plan will also be on the websites for Eddy County and Wells County. The public is encouraged to share input on the plan.

10.1 Eddy 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 Eddy 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: Eddy County Emergency Manager
 524 Central Ave
 New Rockford, ND 58356
 thompsonlm@nd.gov

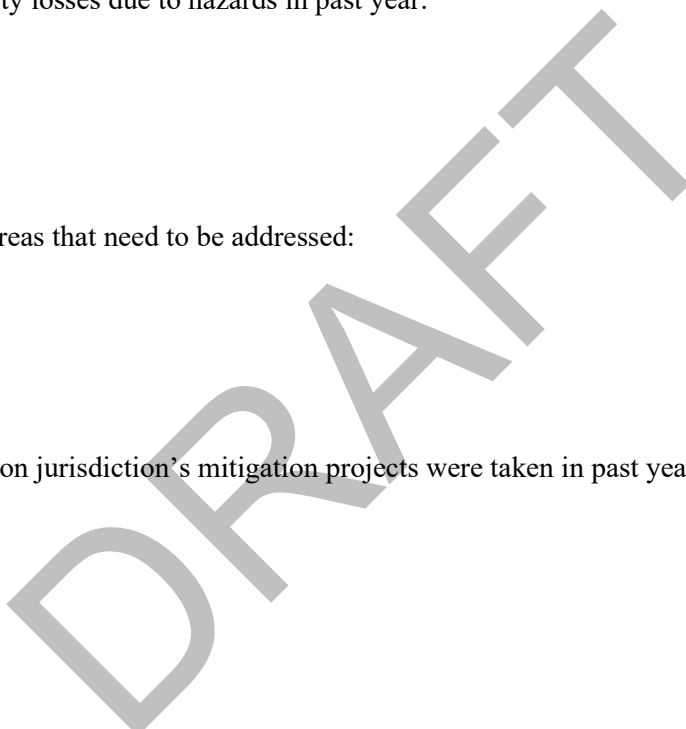
Due: March 15

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:



First & Last Name	
Title & Jurisdiction Represented	
Date (MM/DD/YYYY)	
Contact Info (Email & Phone)	

10.2 Wells 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 Wells 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: Wells County Emergency Manager
 600 Railway St. N., Suite 114
 Fessenden, ND 58438
 troehric@nd.gov

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:

First & Last Name	
Title & Jurisdiction Represented	
Date (MM/DD/YYYY)	
Contact Info (Email & Phone)	