

## SECTION 3.0 HAZARD ASSESSMENT AND HISTORICAL DATA

### 3.1 Hazard Overview

Todd County faces the challenge of several potential natural, human caused and technological hazards. The following is an assessment of the frequency of occurrence, historical impacts, and rankings of real and potential hazards facing Todd County. This assessment is based on the best available information, including information obtained by local, state, and federal sources as well as through local official and citizen participation.

To quantify risk assessment information gathered for each identified hazard, color coding is used according to the following:

<i>Frequency</i>		
Future timeframe event most likely to occur		
	Highly Likely	Near 100% probability in next year
	Likely	At least 1 chance in next 10 years
	Occasional	At least 1 chance in next 100 years
	Unlikely	Less than 1% Probability in next 100 years

<i>Warning</i>		
Amount of warning time prior to hazard event occurring		
	None to Minimal	None to three hours of warning time
	3 to 6 Hours	Three to six hours of warning time
	6 to 12 Hours	Six to twelve hours of warning time
	More than 12 Hrs	More than twelve hours of warning time

<i>Impact</i>		
Measures the perceived level of impact on the entire County		
	Substantial	Widespread injury, loss of life and property damage
	Major	Significant property damage, great injury and loss of life
	Minor	Limited property damage, minimal injury and loss of life
	Limited	Cosmetic property damage, no loss of life, minimal injury

<i>Area</i>		
<b><i>Total area of Sector effected including all cities and townships</i></b>		
	Catastrophic	Majority or all of the County effected
	Critical	Twenty-five to fifty percent of County effected
	Limited	Ten to twenty-five percent of County effected
	Negligible	Localized area of County effected

<i>Duration</i>		
Length of duration of hazard event limited to the event itself or length of time the event can cause injury to persons, loss of life, and/or potential property damage		
	More than 24 Hrs	Over 24 hours
	12 to 24 Hours	Twelve to twenty-four hours
	1 to 12 Hours	One to twelve hours
	Less than 1 Hour	Less than one hour

<i>Risk to Life/Injury and Risk to Property</i>		
Measures the perceived risk to bodily harm or injury and/or property damage in the immediate proximity where the specific hazard occurs.		
	Very High	Total loss of life and destruction of property
	High	High loss of life, injury or property damage
	Limited	Small loss of life, injury, and property damage
	Minimal	No loss of life, cosmetic property damage if any

Through surveys and meetings of the Hazard Mitigation Team, numerous hazards were identified. The Hazard Mitigation Team then reviewed and discussed each identified potential hazard and its relationship to other identified potential hazards as well as its relevance to Todd County by using an assessment process that uses thirteen criteria listed in table 3-1.

**Table 3-1 Hazard Assessments**

Frequency	Warning Time	Impact	Area
Duration	Risk to Citizens & People	Risk to Animals & Livestock	Risk to Housing & Living Quarters
Risk to Critical Facilities & Response Time	Risk to Special Facilities & Community Resources	Risk to Infrastructure & Lifelines	Risk to HazMat Facilities & Public Health Concerns
Risk to Commercial & Industrial Facilities			

Through this process the Hazard Mitigation Team determined that two groups of hazards would be best to classify the results. The two groups include Natural hazards and Human Caused/ Technological hazards (HCT). The following hazards were identified for detailed analysis in table 3-2.

**Table 3-2**

Natural	Technological/Human Caused
Severe Summer Storms	Structural Fire
Tornadoes	Hazardous Material Transportation
Flooding & Flash Flooding	Hazardous Material (Fixed)
Drought	Groundwater Contamination and Depletion
Wind Storm	Terrorism and Civil Disorder
Extreme Heat	Power Grid Failure
Wildfires	Computer Viruses
Earthquakes	Railroad Interference with Emergency Response
Winter Storms	
Infectious Disease	

This chapter identifies all hazards affecting Todd County. It provides information on the history and extent of hazards, evaluates the possible effects, identifies vulnerable populations and assets (buildings, critical facilities, and essential infrastructure), and estimates potential losses that may occur. This process identifies the most critical problems and issues that require mitigation action.

## 3.2 Natural Hazards

Natural Hazard refers to all atmospheric, hydrologic, geologic (especially seismic and volcanic), and wildfire phenomena that, because of their location, severity, and frequency, have the potential to affect humans, their structures, or their activities adversely.

### 3.2.1 *Severe Summer Storms*

#### Thunderstorm

A thunderstorm is a common natural occurrence that takes place May through August. Thunderstorms are capable of producing thunder, lightning, straight-lined winds, hail, heavy rain, flooding and even tornadoes. A thunderstorm is considered to be “severe” when it contains either by itself or a combination of hail 3/4 “or greater, winds gusting in excess of 50 knots (57.5 mph), and/or the presence of a tornado.

## Thunderstorm History

The National Climatic Data Center lists 53 thunderstorm wind events that have impacted Todd County since 1950. While no injuries have resulted from these storm events, property damage has occurred. On June 11, 2001, a thunderstorm caused \$50,000 worth of property damage in Long Prairie. Two years later, on July 2<sup>nd</sup>, 2003, a thunderstorm caused the same amount of property damage in Staples.

## Lightning

Lightning occurs throughout the year but is commonly associated with summer storms. Lightning is an electrical discharge resulting from the buildup of positive and negative charges within a thunderstorm. When enough energy is gathered, lightning appears as a “bolt”. Nearly 80 percent of all lightning activity occurs within a cloud and never reaches the ground.

## Lightning History

Little information is available on lightning activity within Todd County. The table below indicates casualties and reports of damage caused by lightning from 1959 to 1994. Most lightning occurs within the summer months and is most commonly present during afternoon and evening hours.

**Table 3-3**

<b>Lightning Casualties and Damages in Minnesota (1959-1994)</b>		
<b>Season</b>	<b>Casualties</b>	<b>Damage Reports</b>
Spring	21	95
Summer	123	256
Fall	25	54
Winter	0	1

## Hail Storms

Another product of thunderstorms is hail. Hail is formed when water droplets are carried through thunderstorm updrafts to the freezing regions of the cloud. They are then pushed through the updrafts and downdrafts of the clouds mixing with other water droplets until a pellet of ice is formed which can no longer be supported by the updrafts. Most hail is reported to be ranging in size of pea size to golf ball size. However, on rare occasions hail can reach larger sizes.

## Hail Storm History

Table 3-4 shows recorded events of hail storm activity within Todd County.

**Table 3-4**

<b>Hail Storm Activity</b>		
<b>Date</b>	<b>Time</b>	<b>Size of hail (inches)</b>
07/11/1972	9:45 PM	1.75
08/24/1975	2:37 PM	1.75
07/29/1976	6:00 PM	0.75
07/09/1984	3:30 PM	1.75
07/20/1987	5:40 AM	0.75
08/21/1987	1:08 PM	0.75
06/24/1988	8:14 PM	1.00
07/31/1988	3:30 AM	1.75
05/29/1989	10:40 AM	1.75
07/02/1989	9:11 PM	1.00
07/02/1989	9:34 PM	0.75
8/31/1989	9:15 AM	1.75
05/22/1990	1:28 PM	1.75
05/22/1990	2:25 PM	0.75
05/22/1990	2:45 PM	0.75
08/25/1990	11:10 PM	1.75
06/28/1991	6:24 PM	1.75
08/13/1994	2:17 AM	0.75
07/01/1996	6:10 PM	0.75
07/01/1996	6:45 PM	0.88
07/11/1996	6:20 PM	1.00
07/21/1996	6:51 PM	1.00
06/23/1997	12:05 AM	1.00
06/28/1997	4:40 AM	1.00
08/03/1997	8:35 PM	0.75
08/23/1997	8:30 AM	0.75
05/18/1998	7:15 PM	0.75
06/11/1998	12:45 AM	0.88
09/25/1998	9:40 PM	0.88
09/25/1998	9:46 PM	1.75
09/25/1998	9:49 PM	1.00
09/25/1998	9:50 PM	1.75
06/06/1999	2:10 PM	0.75
07/25/1999	4:30 PM	0.75
07/28/1999	10:48 PM	1.00
08/12/1999	2:18 PM	0.75
06/11/2001	1:45 PM	1.75
06/11/2001	9:57 AM	1.25
06/11/2001	10:27 AM	1.75
06/11/2001	10:32 AM	1.00
08/17/2001	6:00 PM	0.75
08/17/2001	6:40 PM	0.75
04/16/2002	7:55 PM	0.88
04/18/2002	2:25 AM	0.75
06/19/2002	8:55 AM	0.75
07/07/2002	2:45 PM	0.75
07/07/2002	8:10 PM	0.75
07/07/2002	8:15 PM	1.75
09/01/2002	1:15 PM	0.75
09/01/2002	12:50 PM	0.75
09/02/2002	7:29 AM	0.75

09/02/2002	7:55 AM	1.00
09/05/2002	9:00 PM	0.75
06/22/2003	6:44 PM	0.75
06/23/2003	1:20 PM	0.88
06/23/2003	12:54 PM	0.75
06/24/2003	4:00 PM	0.75
07/19/2003	2:42 PM	1.00
08/10/2003	4:35 PM	0.88
07/13/2004	12:32 AM	0.75
07/15/2004	5:00 PM	0.88
08/29/2004	6:00 PM	1.00
04/05/2005	7:52 PM	0.75
06/08/2005	1:20 AM	0.88
06/13/2005	7:45 PM	0.75
06/20/2005	10:22 AM	0.75
08/16/2005	4:35 PM	0.75
09/03/2005	2:20 PM	1.75
09/05/2005	10:00 PM	0.75
06/05/2006	3:51 PM	0.75
07/16/2006	1:24 AM	0.75
07/16/2006	1:37 AM	0.75

<http://www4.ncdc.noaa.gov>

### Risk & Vulnerabilities for Summer Storms

**Table 3-5**

	<b>Frequency</b>	<b>Warning Time</b>	<b>Impact</b>	<b>Area</b>	<b>Duration</b>	<b>Life/Injury</b>	<b>Property</b>
<b>Todd County</b>	<b>High Likely</b>	<b>3 to 6 hours</b>	<b>minor</b>	<b>Critical</b>	<b>1-12 hours</b>	<b>Limited</b>	<b>Limited</b>

All people with little or no shelter are susceptible to summer storms. Overall, every community in regard to its geography stands an equal chance of being hit by a summer storm.

### Plans, Programs & Policies

- National Weather Service storm monitoring activities
- NOAA Weather Radio, local TV and radio channels
- Sever Weather Shelters
- Sever Weather Alert System
- Infrastructure Improvements

### 3.2.2 *Tornadoes*

A tornado, according to American Heritage History Dictionary is defined as “A rotating column of air ranging in width from a few yards to more than a mile and whirling at destructively high speeds, usually accompanied by a funnel-shaped downward extension of a cumulonimbus cloud”. Tornadoes are commonly found during severe summer storms and have at times caused great damage to communities within the upper Midwest. Tornadoes are caused by cool air overriding a layer of warm air, forcing the warm air to rise rapidly. Within Minnesota, the typical “tornado season” is during March through August but, these can occur at anytime of the year. Tornadoes most commonly occur during afternoon and evening hours of a day with over 80 percent occurring between noon and midnight.

The magnitude of tornadoes is measured according to the Fujita Scale, commonly known as the “F” Scale. This scale (table 3-6) displays the magnitude of a particular tornado based on several criteria including amount of destruction, wind speeds, and other data collected after the affected area has been assessed. Because of the random nature of tornadoes, there is little ability to predict specifically where they will occur within a region.

Table 3-6

**“Old” Fujita Scale**

<b>F-Scale</b>	<b>Intensity Phrase</b>	<b>Wind Speed</b>	<b>Type of Damage Done</b>
F0	Gale Tornado	40-72 mph	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards.
F1	Moderate Tornado	73-112 mph	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
F2	Significant Tornado	113-157 mph	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
F3	Severe Tornado	158-206 mph	Roof and some walls torn off well constructed houses; trains overturned; most trees in forest uprooted
F4	Devastating Tornado	207-260 mph	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	Incredible Tornado	261-318 mph	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-inforced concrete structures badly damaged.
F6	Inconceivable Tornado	319-379 mph	These winds are very unlikely. The small area of damage they might produce would probably not be recognizable along with the mess produced by F4 and F5 wind that would surround the F6 winds. Missiles, such as cars and refrigerators would do serious secondary damage that could not be directly identified as F6 damage. If this level is ever achieved, evidence for it might only be found in some manner of ground swirl pattern, for it may never be identifiable through engineering studies

As of February 1<sup>st</sup>, 2007 a new version of the Fujita Scale will be used to determine and classify the severity of tornadoes. Table 3-7 is a representation of this enhanced Fujita scale.

**Table 3-7** “New Fujita Scale”

FUJITA SCALE			DERIVED EF SCALE		OPERATIONAL EF SCALE	
F Number	Fastest 1/4-mile (mph)	3 Second Gust (mph)	EF Number	3 Second Gust (mph)	EF Number	3 Second Gust (mph)
0	40-72	45-78	0	65-85	<b>0</b>	<b>65-85</b>
1	73-112	79-117	1	86-109	<b>1</b>	<b>86-110</b>
2	113-157	118-161	2	110-137	<b>2</b>	<b>111-135</b>
3	158-207	162-209	3	138-167	<b>3</b>	<b>136-165</b>
4	208-260	210-261	4	168-199	<b>4</b>	<b>166-200</b>
5	261-318	262-317	5	200-234	<b>5</b>	<b>Over 200</b>

Source: <http://www.spc.noaa.gov/faq/tornado/ef-scale.html>

### History

Tornadoes occur in every county of Minnesota. Since 1957, Todd County has encountered fifteen tornadoes which have caused an estimated \$44,000 in property damage. Of the fifteen tornadoes in Todd County, there have been no deaths and only one injury caused. These tornadoes typically happen during the late afternoon or evening hours. Found in table 3-8 is information on each tornado that has happened within Todd County since 1957. Information on tornado magnitude classification is measured by the Fujita Scale. In table 3-6, is a copy of the scale used prior to February 1<sup>st</sup>, 2007 is shown. In table 3-7, a copy of the “enhanced” Fujita Scale is shown above.

**Table 3-8**

<b>Tornado Data Table</b>					
<b>Date</b>	<b>Time</b>	<b>Deaths</b>	<b>Injuries</b>	<b>Magnitude</b>	<b>Property Damage \$</b>
05/21/1957	12:00PM	0	0	F1	25,000
6/22/1965	1:30 PM	0	0	F0	0
07/04/1966	8:50 PM	0	0	F0	3,000
07/05/1971	6:15 PM	0	0	F0	3,000
07/10/1987	8:55 PM	0	0	F0	0
08/03/1990	4:31 PM	0	0	F0	3,000
07/08/2000	8:43 PM	0	1	F2	0
06/11/2001	1:55 PM	0	0	F0	0
06/13/2001	6:15 PM	0	0	F3	10,000
06/13/2001	6:44 PM	0	0	F0	0
06/13/2001	7:32 PM	0	0	F0	0
07/19/2003	2:25 PM	0	0	F0	0
07/19/2003	3:00 PM	0	0	F0	0
08/29/2004	5:47 PM	0	0	F0	0
08/29/2004	6:00 PM	0	0	F0	0
<b>Total</b>	<b>N/A</b>	<b>0</b>	<b>1</b>	<b>N/A</b>	<b>44,000</b>

Source: [www.ncdc.noaa.gov](http://www.ncdc.noaa.gov)

Risk & Vulnerabilities

**Table 3-9**

	<b>Frequency</b>	<b>Warning Time</b>	<b>Impact</b>	<b>Area</b>	<b>Duration</b>	<b>Life/Injury</b>	<b>Property</b>
<b>Todd County</b>	Likely	None to Minimal	Minor	Limited	Less than 1 hour	Limited	Limited

Damage from tornadoes can vary greatly depending on the magnitude. Tornadoes can damage or destroy infrastructure throughout its impact area, cause injuries to humans and livestock and even death in rare situations. Table 3-9 shows the risks identified by Todd County in regards to tornado activity. Areas prone to the most damaging effects of tornadoes within Todd County are mobile home parks and older buildings.

Plans, Programs & Policies

- National Weather Service Storm Monitoring Activities
- NOAA Weather Radio
- Severe Weather Shelters
- Local Warning Sirens
- Local TV/Radio Channels

### 3.2.3 *Flooding and Flash Flooding*

A flood can be defined as “an overflowing of water onto land that is normally dry”. The area where a flood would take place is considered to be a floodplain. This area is typically found along channels, rivers, streams, lakes, or other water bodies that are susceptible of flooding. A large percentage of floodplains have been identified by FEMA and mapped for floodplain management.

Floods are classified into floodplains by years. Examples of this include a five year floodplain or a 100 year floodplain. This classification may be a misleading term. A five year floodplain means that there is a 20% chance of a flood occurring in a specified area every year. A 100 year floodplain means that there is a 1% chance of a flood occurring in a specified area every year. It is important to note that it is possible for a hundred year flood to happen more than once every hundred years.

Floodplains are also referred to as Special Flood Hazard Areas (SFHA) and are mapped by FEMA and the Minnesota Department of Natural Resources through the National Flood Insurance Program (NFIP). The Flood Insurance Maps (FIRM) are used to determine what areas need flood insurance and are on file with the Todd County Emergency Management Director.

Flooding occurs when water levels exceed riverbanks and encroach into floodplains. This occurs from a combination of late winter snowpack, frozen soil which prevents absorption of water, rapid snow melting, and heavy widespread precipitation which causes flash floods.

A “flash flood” can be defined for this plan as “flooding that occurs in a given area due to localized drainage and is outside the boundaries of the FIRM floodplain”. These floods result from slow moving heavy rains within a given area. Areas without adequate storm sewers and storm drainage systems experience flash flooding more often than those with adequate systems.

Though less common, an identified possible threat within the County to property is slow rising lake levels. Due to the number of lakes found within the County, this threat is a possibility when an area experiences above average precipitation over a long period of time. This is especially a concern for lakes that are land locked basins with poor lake outlets.

## History

Floods have occurred within Todd County, but significant records/information is not available. Table 3-10 indicates the occurrences of floods within Todd County and identifies estimated property damage costs.

**Table 3-10**

<b>Date</b>	<b>Type of Occurrence</b>	<b>Location</b>	<b>Time</b>	<b>Deaths</b>	<b>Injuries</b>	<b>Property Damage \$</b>
04/07/2001	Flood	Countywide	5:00 AM	0	0	200,000
06/13/2001	Flash Flood	Long Prairie	9:30 PM	0	0	100,000
07/07/2002	Flash Flood	North Portion	8:05 PM	0	0	0
07/10/2002	Flash Flood	South Portion	6:30 AM	0	0	0
06/23/2003	Flash Flood	Long Prairie	5:00 PM	0	0	0
<b>Total</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>0</b>	<b>0</b>	<b>300,000</b>

## Risks & Vulnerabilities

**Table 3-11**

	<b>Frequency</b>	<b>Warning Time</b>	<b>Impact</b>	<b>Area</b>	<b>Duration</b>	<b>Life/Injury</b>	<b>Property</b>
<b>Todd County</b>	Likely	3-6 hours	Minor	Limited	More than 24 hours	Limited	Limited

Todd County has identified the odds for flood activity as likely. Though the occurrences are high, the amount of damage to property, impact area and cause to injury or death are minimal. Areas that are prone to flooding in Todd County are identified by FIRM maps for the County.

## Plans, Programs & Policies

- 100-year Floodplain Mapping
- Participation in NFIP
- Flood emergency response plan included within the Todd County Emergency Operations Plan (EOP)

### 3.2.4 Drought

A drought is a normal climatic event that happens throughout the world, but with a variety of features changing its characteristics region by region. There are four main aspects of defining a drought. These include:

- Meteorological – a lack of precipitation due to climatic differences
- Agricultural – refers to a situation when the amount of moisture in the soil no longer meets the needs of a particular crop
- Hydrological – occurs when surface and subsurface water supplies are below normal
- Socioeconomic – refers to the situation that occurs when physical water shortage begins to affect people

#### History

Droughts have occurred on average at least once during every decade within the state of Minnesota since 1900. The years most notable for drought occurrences within Todd County are during the 1930’s, 1970’s, and 1980’s. During these events, crop loss was substantial and many monthly records were set, as shown in the table below.

**Table 3-12**

<b>Historical Occurrences of Drought in Minnesota Involving Todd County</b>		
Year	Location	Remarks
2003	Statewide	Dry weather began in early September and persisted for several days. Above normal temperatures added to dry conditions.
1987-1989	Statewide	Established new “average low precipitation” and “average high temperature” records. Farmers lost most, if not all, of the year’s crop. Drought also affected poor production, the forest products industry, public water supplies and fish and wildlife dependent on adequate surface water. Mississippi River flow levels threatened to drop below the Minneapolis Water Works intake pipes.
1974-1977	Statewide	Began in 1974 in parts of south-central and western MN. Most severely affected areas were the Otter Tail and Lac Qui Parle River basins. Dry conditions caused lower water levels within wells, which are linked to record low stream flows throughout the state. Late summer forest fires broke out. Conflicts arose between domestic well owners and neighboring high capacity well owners.
1931-1942	Statewide	Intensity and duration differed locally.
1911-1914	Statewide	Intensity and duration differed locally.

Risks & Vulnerabilities

**Table 3-13**

	<b>Frequency</b>	<b>Warning Time</b>	<b>Impact</b>	<b>Area</b>	<b>Duration</b>	<b>Life/Injury</b>	<b>Property</b>
<b>Todd County</b>	Likely	More than 12 hours	Major	Critical	More than 24 hours	Limited	High

Areas most prone to the effects of droughts within Todd County consist of: farmland, wells, Amish communities, rivers and lakes.

Plans, Programs & Policies

- Water usage monitoring
- Local water usage limits, bans, and regulations
- US Department of Agriculture
- Local medical centers

*3.2.5 Windstorms*

Windstorms can occur at any time throughout the year; however these are most commonly experienced during severe thunderstorms in warm weather months. Windstorms most commonly include downbursts, gust front, tornadoes, and straight-lined winds. A windstorm is defined as an event with wind speeds greater than 60 miles per hour.

There are several different types of windstorms. A “downburst” is a rather underrated thunderstorm threat defined as a strong downdraft with an out rush of damaging winds on or near the earths’ surface. When people experience property damage from a downburst, they often do not believe that “just wind” could have caused the damage, and they assume that they were struck by a tornado. Downbursts may have wind gusts to nearly 130 miles per hour and are capable of the same damage as a medium-sized tornado.

A “gust front” is the leading edge of the thunderstorm downdraft air. It is most prominent near the rain-free cloud base and on the leading edge of an approaching thunderstorm and is usually marked by gusty, cool winds, and sometimes a blowing dust. The gust front often precedes the thunderstorm precipitation by several minutes.

“Straight-lined winds”, when associated with a thunderstorm, are most frequently found with the gust front. These winds originate as downdraft air reaches the ground and rapidly spread out, becoming a strong horizontal flow.

The National Weather Service notes the following effects of various wind speeds:

**Table 3-14**

<b>Effect of Various Wind Speeds</b>	
<b>Wind Speed</b>	<b>Effects</b>
25-31 mph	Large branches in motion, whistling in telephone wires
32-38 mph	Whole trees in motion
39-54 mph	Branches break off of trees, wind impedes walking
55-72 mph	Damage to chimneys and TV antennas, pushes over shallow rooted trees
73-112 mph	Peels surface off roofs, windows broken and trailer houses overturned
113+ mph	Roofs torn off houses, weak buildings and trailer houses destroyed, large trees uprooted

History

Limited information is available on the occurrences of windstorms within Todd County.

Risks & Vulnerabilities

**Table 3-15**

	<b>Frequency</b>	<b>Warning Time</b>	<b>Impact</b>	<b>Area</b>	<b>Duration</b>	<b>Life/Injury</b>	<b>Property</b>
<b>Todd County</b>	Likely	6-12 Hours	Minor	Limited	1-12 hours	Limited	Limited

Todd County has identified the risks of windstorms as a likely occurrence with limited/minimal impacts on the County in regards to property damage, injury and/or loss of life. Areas most prone to wind damage consist of: crops, outdoor recreation areas, mobile home parks, and old structures.

Plans, Programs & Policies

- Windbreaks; Natural Vegetative Cover

### 3.2.6 Extreme Heat

Extreme heat has a detrimental impact on the human body. In extreme heat and high humidity, evaporation of perspiration is slowed and the body must work harder to maintain a normal temperature. The impacts of heat are determined by relative humidity and air temperature. The combination of these provides a real feel temperature called “heat index”. It is important to note that full exposure to sunshine may increase the heat index by 15 degrees Fahrenheit.

#### History

Limited information is available on extreme heat occurrences within Todd County. It is identified as a possible hazard. It is also proven that having a high heat index can be very dangerous.

#### Risk & Vulnerabilities

**Table 3-16**

	<b>Frequency</b>	<b>Warning Time</b>	<b>Impact</b>	<b>Area</b>	<b>Duration</b>	<b>Life/Injury</b>	<b>Property</b>
<b>Todd County</b>	Highly Likely	6-12 hours	Minor	Limited	1-12 Hours	Minimal	Limited

Older adults, young children, and those who are sick or overweight are more prone to be effected by extreme heat.

#### Plans, Programs & Policies

- National Weather Service
- Local radio and television
- Red Cross
- Center for Disease Control

### 3.2.7 Wildfire

As defined in the Minnesota State Hazard Mitigation Plan, a wildfire is any fire on wild land (including forest, brush, range, grass, etc.) that is not a prescribed natural fire and thus, requires a suppression response. These fires are not controlled as they spread through vegetative fuels, exposing and possibly consuming structures. While some wildfires start by natural causes like lightning, humans cause four out of every five wildfires. The risk of wildfire depends on the interactions of several factors during the year, including fuel, topography and weather. Both fuels and topography will not change dramatically from year to year; however, weather can fluctuate on a daily basis.

History

Table 3-17 below indicates the four largest wildfires in the state of Minnesota. Highlighted within the table is the Motley fire of 1980 which affected the Northeastern corner of Todd County. The Motley fire consisted of two strings of fire (Motley and Phillbrook string) which make up the overall fire. This fire burned a total of 7,200 acres of land and ten structures. There was a total of 300 head of livestock lost, \$750,000 worth of real estate lost and \$400,000 of standing timber lost. In order to put the fire out, over 100 Minnesota National Guard troops based out of Camp Ripley were deployed.

From 1980 to 1999, there were a total of 305 wildfires reported to the MN DNR occurring in Todd County. Of these wildfires, 4,982 acres of land were burnt with an average suppression cost of being \$365.88. The leading cause of these fires was due to debris and happened during daytime hours.

**Table 3-17**

<b>Year</b>	<b>Event</b>
2000	Carlos Edge fire burned 8,000 acres, destroyed over 4 structures, and endangered the towns of Linnwood, Stacy, and Wyoming.
1980	Motley fire burned 7,200 acres, destroyed over 10 structures, and endangered the towns of Motley and Phillbrook.
1977	Wildland fires destroyed hundreds of thousands of acres of forestland and millions of dollars in homes and improved property. Suppression costs that year totaled around \$25 million.
1976	Badoura fire burned 23,000 acres and a dozen buildings in just six hours.

Risks & Vulnerabilities

**Table 3-18**

	<b>Frequency</b>	<b>Warning Time</b>	<b>Impact</b>	<b>Area</b>	<b>Duration</b>	<b>Life/Injury</b>	<b>Property</b>
<b>Todd County</b>	Likely	3-6 hours	Major	Limited	More than 24 hours	Limited	High

Areas most prone to wildfire activity include: grasslands, woods, and rural households.

Plans, Programs & Policies

- Local Fire Departments and Associations
- Minnesota Department of Natural Resources
- Rural Fire Assistance Program
- US Forest Service
- Local Fire Wardens
- National Interagency Fire Center

### 3.2.8 Earthquake

Though seismic activity within Todd County is very rare, it is possible and has happened within the last 100 years. Earthquakes are produced by movement of solid rock masses moving past one another along fracture plans called faults. Earthquakes are measured two ways. The first way is “Intensity” also known as the “Mercalli scale”, which provides a number based on people’s observations. The other way to measure earthquakes is “Magnitude” also known as the “Richter scale”, which describes the overall strength of the earthquake through the use of a seismograph.

#### History

On August 3<sup>rd</sup>, 1917 the City of Staples, MN experienced the only recorded earthquake to happen within Todd County. This earthquake is also one of the strongest to happen within Minnesota in the past century that is well documented. The overall magnitude of this earthquake was 4.3 with an overall affected area being 48,000 km<sup>2</sup>.

#### Risk & Vulnerabilities

**Table 3-19**

	<b>Frequency</b>	<b>Warning Time</b>	<b>Impact</b>	<b>Area</b>	<b>Duration</b>	<b>Life/Injury</b>	<b>Property</b>
<b>Todd County</b>	Unlikely	None to minimal	Minor	Limited	Less than 1 hour	Limited	Limited

Due to the rare occurrence of an earthquake happening within Todd County and the unpredictability of these, no specific area has been identified as being more vulnerable than another.

#### Plans, Programs & Policies

- National Weather Service

### 3.2.9 Winter Storms and Events

Winter storms are a common occurrence in Minnesota. These storms consist of blizzards, ice storms, sleet, extreme cold, and heavy snow or snow storms. All of these types of storms are possible within Todd County. Typically residents expect this type of weather at least a few times a year. The following information identifies characteristics of these winter storms:

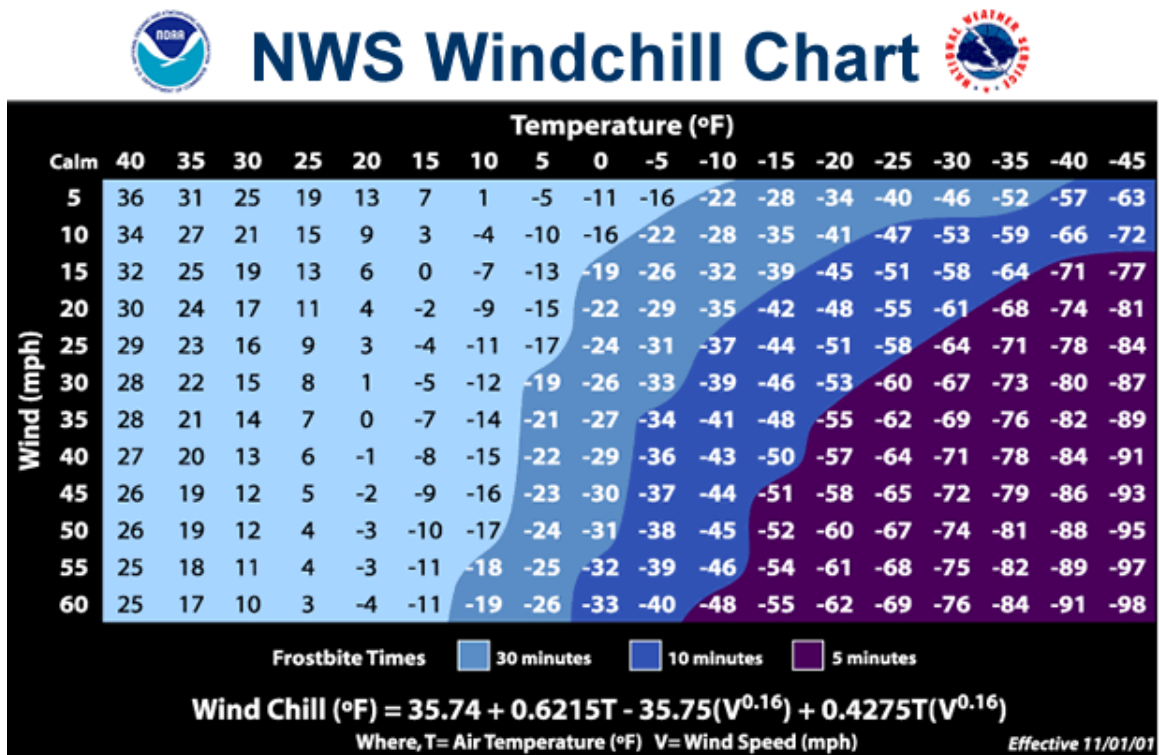
Blizzards consist of strong winds (typically averaging 35 miles per hour or more) and very low visibility due to blowing or falling snow. This type of winter storm is identified as being the most dangerous and can have temperatures below 10 degrees Fahrenheit.

Ice Storms exist when rain occurs and air temperatures exceed 32 degree Fahrenheit, but the surface temperature remains below freezing. When the rain meets the ground surface, ice accumulates. The National Weather Service defines an ice storm as accumulations of ice greater than ¼ of an inch.

Sleet forms when precipitation originating as rain travels through freezing temperatures causing the rain to freeze before reaching the ground. Generally, sleet storm events are shorter in duration than ice storms, and generally create lower impact problems.

Extreme cold is a difficult occurrence to define, but is considered to be when temperatures are well below zero degrees Fahrenheit. Extreme cold can affect not only humans but also infrastructure and automobiles. If proper measures are not taken for handling extreme cold situations frostbite, hypothermia, and even loss of life can occur. Extreme cold is also associated with wind chill. Wind chill can be defined as the rate of heat loss on the human body resulting from a combined effect of low temperature and wind. Table 3-20 indicates wind chill in degrees Fahrenheit.

Table 3-20



Source: <http://www.nws.noaa.gov/om/windchill/index.shtml>

## History

According to the National Climatic Data Center (NCDC), two blizzards (December 1995 & January 1996) and four ice storms have occurred within Todd County. Both blizzards affected much of central and western Minnesota, closing some roads and several schools. The ice storms which have occurred within Todd County caused several transportation related accidents and overall financial losses due to lost wages and revenue.

## Risks & Vulnerabilities

**Table 3-21**

	<b>Frequency</b>	<b>Warning Time</b>	<b>Impact</b>	<b>Area</b>	<b>Duration</b>	<b>Life/Injury</b>	<b>Property</b>
<b>Todd County</b>	Likely	6-12 hours	Major	Critical	More than 24 hours	Limited	Limited

Roads become hazardous to the public during winter storm events. Small children and the elderly are most prone to health problems during these events. Livestock and wildlife are susceptible to winter storms due to the hardship that is caused in finding food and water.

## Plans, Programs & Policies

- Infrastructure Improvements
- Snow fencing and windbreaks including natural vegetation
- Cold weather awareness and public education
- Snow removal (salt, sand, etc.)
- Local TV and radio channels

### *3.2.10 Infectious Diseases*

Infectious diseases occur in humans and/or animals and can cause sickness and death. In the mid-twentieth century, antibiotics cured many of the diseases that were life-threatening. Eradicating the specter of debilitating and fatal diseases, people were optimistic about a world without infectious diseases. Since then, new diseases emerged that temper that optimism, such as AIDS and new strains of influenza. In recent years, the increasing mobility of people throughout the world brought the recurrence of diseases that were thought to be eradicated such as monkey pox.

Source: Minnesota State Hazard Mitigation Plan; Centers for Disease Control

## History

Bacteria existed long before humans evolved, and bacterial diseases probably co-evolved with each species. Many bacterial diseases that we see today have been around for as long as we have, others may have developed later.

Between the middle of 1918 and the middle of 1919, the worldwide Spanish Influenza epidemic killed at least 21 million people – well over twice the number of combat deaths in World War I. The “Spanish” flu had first appeared in America during the spring of 1918.

All over the world, Spanish Influenza ravaged civilian populations. One-quarter of all Americans suffered bouts of influenza. More than 600,000 Americans died, 10,000 of them were Minnesotans. The city of St. Paul saw more than 1,000 deaths; while the City of Minneapolis, more than 1,300.

In recent years, the State of Minnesota has not had an infectious disease outbreak that reached epidemic proportion.

**Table 3-22**

<b>Time Course of Common Infections</b> (all in days)			
<b>Disease</b>	<b>Incubation period</b>	<b>Latency period</b>	<b>Infectious period</b>
Measles	8-13	6-9	6-7
Mumps	12-26	12-18	4-8
Pertussis	6-10	21-23	7-10
Rubella	14-21	7-14	10-12
Diphtheria	2-5	14-21	2-5
Varicella	13-17	8-12	10-11
Hepatitis B	50-110	13-17	19-22
Poliomyelitis	7-12	1-3	14-20
Influenza	1-3	1-3	2-3

*Source: <http://uhavax.hartford.edu/bugl/histepi.htm>*

The tables on the next two pages list several common source and host-to-host epidemics, the causative agent (followed by V for virus, B for bacteria, and P for protozoa), sources of infection, and the reservoirs of the infection. Current knowledge tells us that humans are the only reservoirs for sexually transmitted diseases.

Table 3-23

Common Source Epidemic Diseases			
Disease	Causative Agent	Infection Sources	Reservoirs
Anthrax	<i>Bacillus anthracis</i> (B)	Milk or meat from infected animals	Cattle, swine, goats, sheep, horses
Bacillary Dysentery	<i>Shigella dysenteriae</i> (B)	Fecal contamination of food and water	Humans
Botulism	<i>Clostridium botulinum</i> (B)	Soil-contaminated food	Soil
Brucellosis	<i>Brucella melitensis</i> (B)	Milk or meat from infected animals	Cattle, swine, goats, sheep, horses
Cholera	<i>Vibrio cholerae</i> (B)	Fecal contamination of food and water	Humans
Giardiasis	<i>Giardia</i> spp. (P)	Fecal contamination of water	Wild mammals
Hepatitis	Hepatitis A,B,C,D,E (V)	Infected humans	Humans
Paratyphoid	<i>Salmonella paratyphi</i> (B)	Fecal contamination of food and water	Humans
Typhoid Fever	<i>Salmonella typhi</i> (B)	Fecal contamination of food and water	Humans
Host-to-host Epidemics			
Disease	Causative Agent	Infection Sources	Reservoirs
Respiratory Diseases			
Diphtheria	<i>Corynebacterium diphtheriae</i> (B)	Human cases and carriers; infected food and fomites	Humans
Hantavirus pulmonary syndrome	Hantavirus (V)	Inhalation of contaminated fecal material	Rodents
Meningococcal meningitis	<i>Neisseria meningitidis</i> (B)	Human cases and carriers	Humans
Pneumonococcal pneumonia	<i>Streptococcus pneumonia</i> (B)	Human carriers	Humans
Tuberculosis	<i>Mycobacterium tuberculosis</i> (B)	Sputum from human cases; contaminated milk	Humans, cattle
Whooping cough	<i>Bordetella pertussis</i> (B)	Human cases	Humans
German measles	Rubella virus (V)	Human cases	Humans
Influenza	Influenza virus (V)	Human cases	Humans, animals
Measles	Measles virus (V)	Human cases	Humans

Disease	Causative Agent	Infection Sources	Reservoirs
<b>Sexually Transmitted Diseases</b>			
HIV-Disease	HIV (V)	Infected body fluids, blood, semen, etc.	Humans
Chlamydia	<i>Chlamydia trachomatis</i> (B)	Urethral, vaginal, and anal secretions	Humans
Gonorrhea	<i>Neisseria gonorrhoeae</i> (B)	Urethral and vaginal secretions	Humans
Syphilis	<i>Treponema pallidum</i> (B)	Infected exudate or blood	Humans
Trichomoniasis	<i>Trichomonas vaginalis</i> (P)	Urethral, vaginal, prostate secretions	Humans
<b>Vector-borne diseases</b>			
Epidemic typhus	<i>Rickettsia prowazekii</i> (B)	Bite by infected louse	Humans, lice
Lyme disease	<i>Borrelia burgdorferi</i> (B)	Bite from infected tick	Rodents, deer, ticks
Malaria	<i>Plasmodium</i> spp. (P)	Bite from infected Anopheles mosquito	Humans, mosquitoes
Plague	<i>Yersinia pestis</i> (B)	Bite by infected flea	Wild rodents
Rocky Mountain spotted Fever	<i>Rickettsia rickettsii</i> (B)	Bite by infected tick	Ticks, rabbits, mice
<b>Direct-contact diseases</b>			
Psittacosis	<i>Chlamydia psittaci</i> (B)	Contact with birds or bird excrement	Wild and domestic birds
Rabies	Rabies virus (V)	Bite by carnivore	Wild and domestic carnivores
Tularemia	<i>Franciscella tularensis</i> (B)	Contact with rabbits	Rabbits

Source: <http://uhavax.hartford.edu/bugl/histepi.htm>

## Risks & Vulnerabilities

**Table 3-24**

	<b>Frequency</b>	<b>Warning Time</b>	<b>Impact</b>	<b>Area</b>	<b>Duration</b>	<b>Life/Injury</b>	<b>Property</b>
<b>Todd County</b>	Likely	More than 12 hours	Minor	Limited	More than 24 hours	Limited	Minimal

Small children, the elderly, and individuals that have not been vaccinated are most prone to infectious diseases. Individuals that have been exposed to many others on a continuous basis are also highly susceptible to infectious diseases.

## Plans, Programs & Policies

- Center for Disease Control
- Center for Infectious Disease Research & Policy
- Minnesota Department of Health

### 3.3 Human Caused/Technological Hazards

#### 3.3.1 Structural Fire

Structural fires can be defined as “a fire that takes place within infrastructure”. These fires are capable of limited damage to a given area of the County, but are capable of having a significant impact on a community.

#### History

There is limited information on the occurrences of structural fires on a countywide level for Todd County. For more information about this type of identified hazard, contact the local Emergency Management Director or the local fire department for the area of interest.

#### Risks & Vulnerabilities

**Table 3-24**

	<b>Frequency</b>	<b>Warning Time</b>	<b>Impact</b>	<b>Area</b>	<b>Duration</b>	<b>Life/Injury</b>	<b>Property</b>
<b>Todd County</b>	Highly likely	None to minimal	Minor	Negligible	1-12 hours	Limited	High

Older buildings have been identified as being the most susceptible to structural fires within Todd County.

#### Plans, Programs & Policies

- Todd County Emergency Operations Plan

#### 3.3.2 Hazardous Material Transportation

Hazardous materials are transported throughout Todd County in a variety of modes (air, roads, railway & pipelines). Each mode of transportation presents different risks to the County. The majority of transportation of hazardous materials in Todd County consists of moving materials from producers to users, producers to distributors, between storage and use facilities, and hazardous waste materials moving from use to disposal facilities.

#### Air

Hazardous materials are transported within Todd County by air for a variety of reasons. The most common occurrence of hazardous materials being transported by air includes fertilizers and chemicals for agricultural purposes.

## Roads

Todd County has some major roadways in the area that see heavy usage for transportation of materials in general, this includes hazardous waste. These roadways consist of Interstate-94 in the southwestern part of the County, US Hwy 71 which runs throughout the County north to south and US Hwy 10 which passes through Todd County in the northern section of the County. The degree of impact of hazardous spills related to transportation in Todd County is dependent upon the location of the spill and its relative location to concentrated developments and environmentally sensitive areas.

## Rail

This type of hazard is of concern to the northeastern section of the County where heavy rail traffic is apparent. Types of potential hazardous material releases along the County's rail corridors includes, but is not limited to valve leakage, safety valve releases, which carries the potential of releasing hazardous material in the form of liquid or gases in addition to release or spill due to derailment, collision, or similar accidents. Such accidents carry the potential of releasing hundreds to thousands of gallons of material within areas along rail corridors.

## Pipelines

Todd County has a series of pipelines which run through the County. Due to the sensitivity of pipeline data, the pipeline maps are removed from all public copies of this plan, however the Minnesota Office of Pipeline Safety is one of nine state offices to be a state repository for the National Pipeline Mapping System. All inquires as to the viewing of this map can also be directed to the Todd County Emergency Management Director.

## History

Incidents related to the transportation of hazardous materials have occurred. For information on a specific event, contact the local Emergency Management Director for the area of concern.

## Risks & Vulnerabilities

**Table 3-25**

	<b>Frequency</b>	<b>Warning Time</b>	<b>Impact</b>	<b>Area</b>	<b>Duration</b>	<b>Life/Injury</b>	<b>Property</b>
<b>Todd County</b>	Likely	None to minimal	Minor	Negligible	12-24 hours	Limited	Limited

Hazardous materials accidents can and have occurred everywhere. Communities that are along the corridors of Interstate-94, US Hwy 10, and US Hwy 71 are particularly at risk. However, hazardous materials are transported on a daily basis within the County, so any area is at risk of this potential hazard.

Plans, Programs & Policies

- MPCA
- Minnesota Emergency Response Commission
- Individual site plans

3.3.4 *Hazardous Material (Fixed)*

There are many facilities that hold hazardous materials within Todd County. These materials include but are not limited to: flammable liquids, fuels, acids, and corrosive materials. Each of these facilities must file a Risk Management Plan with the County Emergency Management Office, the State Emergency Response Commission, and the Environmental Protection Agency.

History

Todd County has had a history of hazardous material spills, accidents, and similar events within the County. This is largely associated with major roadways and railway transportation corridors, pipelines, and fixed facilities. The following is an inventory of hazardous material related to events as reported from 1990 to 2007 by the National Response Center:

**Table 3-26**

<b>NRC Report#</b>	<b>Incident Date</b>	<b>Street</b>	<b>Location County</b>	<b>City</b>	<b>Type Of Incident</b>	<b>Medium Affected</b>	<b>Material Name</b>
15184	03/27/1990	423 THIRD AVE SW	TODD	LONG PRARIE	FIXED	LAND	OIL, MISC: MOTOR
88396	09/15/1991	SHIRLY'S GAS & GROCERY	TODD	EAGLE BEND	MOBILE	LAND	GASOLINE: AUTOMOTIVE (4.23G PB/G)
204337	10/22/1993	660 CREAMERY STREET	TODD	BROWERVILLE	FIXED	WATER	CAUSTIC
269982	11/12/1994	TODD COUNTY ROAD NO.37NATURE'S LAKEVIEW ED.	TODD	OSAKIS	FIXED	WATER	OIL, MISC: MOTOR
269982	11/12/1994	TODD COUNTY ROAD NO.37NATURE'S LAKEVIEW ED.	TODD	OSAKIS	FIXED	WATER	OTHER OIL
269982	11/12/1994	TODD COUNTY ROAD NO.37NATURE'S LAKEVIEW ED.	TODD	OSAKIS	FIXED	WATER	PAINT

269982	11/12/1994	TODD COUNTY ROAD NO.37NATURE'S LAKEVIEW ED.	TODD	OSAKIS	FIXED	WATER	SOLVENTS
457211	08/25/1998	(null)	TODD	CLARISSA	FIXED	WATER	UNKNOWN MATERIAL
479748	04/08/1999	JUNTION OF ST HWY 28 AND287	TODD	GREY EAGLE	MOBILE	LAND	HYDRAULIC OIL
571790	07/02/2001	HAY FIELDRTE 2 BOX 36	TODD	BROWERVILLE	FIXED	LAND	UNKNOWN MATERIAL
615787	07/06/2002	US HWY 71 FROM 8 MILES SOUTH OF LONG PRAIRIE TO A 1 1/2 NORTH OF LONG PRAIRIE	TODD	LONG PRAIRIE	MOBILE	LAND	TURKEY MANURE
624757	10/03/2002	VIKING GAS CUSHING FACILITYRURAL ROUTE 1 BOX 72C	TODD	CUSHING	CONTINUOUS	AIR	ACROLEIN
624956	10/04/2002	134.02	TODD	PHILBROOK	RAILROAD NON-RELEASE	(null)	(null)
716817	03/23/2004	10 RIVERSIDE DRIVE	TODD	LONG PRARIES	STORAGE TANK	AIR	AMMONIA, ANHYDROUS
758255	05/10/2005	25498 US HWY 71	TODD	LONG PRAIRIE	CONTINUOUS	AIR	AMMONIA
792334	03/29/2006	25498 US HWY 71	TODD	LONG PRAIRIE	CONTINUOUS	AIR	AMMONIA, ANHYDROUS
824305	01/21/2007	ORTON OILHIGHWAY 10	TODD	STAPLES	MOBILE	WATER	GASOLINE: AUTOMOTIVE (UNLEADED)

Source: <http://www.nrc.uscg.mil/foia.html>

### Risks & Vulnerabilities

**Table 3-27**

	<b>Frequency</b>	<b>Warning Time</b>	<b>Impact</b>	<b>Area</b>	<b>Duration</b>	<b>Life/Injury</b>	<b>Property</b>
<b>Todd County</b>	Likely	None to Minimal	Minor	Negligible	More than 24 hours	Limited	Limited

Areas identified in table 3-16 have been identified by the County as being susceptible to fixed location hazardous material accidents.

Plans, Programs & Policies

- MPCA
- Individual Site Plans

*3.3.4 Groundwater Contamination and Depletion*

Groundwater contamination includes the introduction of both point and non-point source pollutants into groundwater. Point source means any discernible, confined and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. Non-point source is a land management activity or land use activity that contributes or may contribute to ground and surface water pollution as a result of runoff, seepage, or percolation and that is not defined as a point source. This contamination also can be extended to include surface waters. For most of the county, individual wells draw from groundwater, however the cities of Menahga, Sebekka, Verndale, Staples, and Wadena maintain municipal drinking water systems monitored by each municipal operator.

Groundwater contamination in Todd County has occurred with limited events or releases. Groundwater depletion is the withdrawal of water from a ground water source at a rate greater than its rate of recharge.

History

There is no recorded event within Todd County of groundwater depletion. There are little to no records identifying contamination events, but these events are a possibility that could happen in the future.

Risks & Vulnerabilities

**Table 3-28**

	<b>Frequency</b>	<b>Warning Time</b>	<b>Impact</b>	<b>Area</b>	<b>Duration</b>	<b>Life/Injury</b>	<b>Property</b>
<b>Todd County</b>	Likely	None to minimal	Minor	Limited	More than 24 hours	Limited	Limited

Groundwater depletion would affect local communities, rural residents, area livestock, and local wildlife in the County. If groundwater contamination was to occur, Todd County residents are the most vulnerable, along with local livestock.

Plans, Programs & Policies

- Wellhead Protection Program
- Minnesota Department of Health
- Environmental Protection Agency (EPA)
- Minnesota Pollution Control Agency (MPCA)

3.3.5 *Terrorism and Civil Disorder*

Human caused hazards, including terrorism, are intentional, malicious, and often time criminal use of force and violence to perpetrate disasters against persons and/or property. Terrorism, including domestic terrorism, is actions intended to intimidate or coerce a government or civilian population to unwanted political or social objectives. These actions can be either domestic or international depending on the origin, base and objectives of the terrorist organizations or individuals perpetrated for personal reasons.

Terrorism hazards include, but are not limited to the use of weapons of mass destruction, including biological, chemical, and nuclear or radiological weaponry; arson, use of incendiary or explosive devices and armed attacks; industrial sabotage and intentional release of hazardous materials; and attacks on technology including computers through viruses or by other means commonly known as “cyberterrorism”.

History

Though terrorism is not a likely event within Todd County, the County has identified this as an event that could possibly happen. Terrorism since September 11, 2001, has brought forth concern to residents along with impacts of such events reaching Todd County.

Risks & Vulnerabilities

**Table 3-29**

	<b>Frequency</b>	<b>Warning Time</b>	<b>Impact</b>	<b>Area</b>	<b>Duration</b>	<b>Life/Injury</b>	<b>Property</b>
<b>Todd County</b>	Likely	None to minimal	Minor	Limited	12-24 hours	Limited	Limited

Though the likeliness of terrorism happening in Todd County is rare, local government buildings are most prone to terrorist attacks within the County.

Plans, Programs & Policies

- Department of Homeland Security
- Minnesota Homeland Security and Emergency Management (HSEM)
- Public education & awareness
- Local police, fire, emergency medical
- Individual public and private facilities

### 3.3.6 Power Grid Failure

A power grid failure in the context of this plan would include any electrical power outage for a period greater than 24 hours.

#### History

Though limited specific information is available about power failures in Todd County, they have occurred and are likely to occur in the future. The general cause is the result of a severe weather event such as thunderstorms that have associated high winds and lightning, ice storms, and winter storms with heavy snow.

The table below identifies the eight largest power grid failures to happen within the US:

**Table 3-30**

<b>Date</b>	<b>Description</b>
11/9/1965	More than 80,000 square miles in seven states and two Canadian provinces go dark and an estimated 30 million people are affected. Six days later, investigators find a single fault relay switch in Ontario caused the outage.
7/13/1977	In New York City, 9 million people are without power for 25 hours after lightning strikes upstate power lines. Police arrest 3,700 in widespread looting and lawlessness.
5/19/1986	A switching problem in an electrical substation at Grand Central Terminal in New York city caused a 12-hour blackout in a four-block area of midtown Manhattan.
8/10/1996	Power goes out for up to 10 hours in a region stretching from Oregon to San Diego and as far east as Texas
10/23/1997	In downtown San Francisco, about 230,000 people in a five-mile long area are affected by a blackout that is later determined by the FBI to have been caused intentionally.
12/8/1998	A construction crew's mistake caused a blackout across a 49-square mile area of the San Francisco peninsula. The outage lasts seven hours and affects more than 940,000 people.
7/6/1999	After three days of scorching heat, power lines give way and cause a 19-hour blackout in sections of New York City.
8/14/2003	The largest power outage in U.S. History sweeps across a vast swath of the northern United States, spreading as far west as Ohio and Michigan, and parts of neighboring Canada. More than 50 Million people are affected.

Source: <http://abcnews.go.com>

## Risks & Vulnerabilities

**Table 3-31**

	<b>Frequency</b>	<b>Warning Time</b>	<b>Impact</b>	<b>Area</b>	<b>Duration</b>	<b>Life/Injury</b>	<b>Property</b>
<b>Todd County</b>	Likely	None to Minimal	Minor	Catastrophic	More than 24 hours	Limited	Limited

No specific area can be identified as being more likely to having a power grid failure occurring with the County. Schools, government centers, hospitals, and areas with higher concentrations of the elderly populations are more susceptible to the effects of power loss.

## Plans, Programs & Policies

- Electric service providers

### *3.3.7 Computer Viruses*

A computer virus is a program or piece of code that is loaded into your computer without your knowledge and runs against your wishes. Viruses can also replicate themselves. All computer viruses are manmade. A simple virus can copy itself over and over, and is relatively easy to produce. Even a simple virus is dangerous because it will quickly use all available memory and bring the system to a halt. An even more dangerous type of virus is one capable of transmitting itself across networks and bypassing security systems.

Some people distinguish between general viruses and worms. A worm is a special type of virus that can replicate itself and use memory, but cannot attach itself to other programs.

Source: <http://www.actlab.utexas.edu/~aviva/compsex/virus/whatis.html>

## History

With the advent of the Apple and IBM Personal Computer in the early eighties came the first modern day computer virus. As these computers became more and more popular a phenomenon known as a computer virus, became evident in 1986. In 1986, the first IBM PC virus “Brain” pandemic began. Each year since then, there has been a significant virus attack as well an increase in attacks. In 1989, the first anti-virus software became available. Today it is a must for all computers.

In January of 2003, the relatively benign “Slammer” (Sapphire) worm becomes the fastest spreading worm to date, infecting 75,000 computers in approximately ten minutes, doubling its numbers every 8.5 seconds in its first minute of infection. The Sobig worm becomes one of the first to join the spam community. Infected computer systems have the potential to become spam relay points and spamming techniques are used to mass-mail copies of the worm to potential victims.

To this date, Todd County has been able to avoid any major attack on their system.

Risks & Vulnerabilities

**Table 3-32**

	<b>Frequency</b>	<b>Warning Time</b>	<b>Impact</b>	<b>Area</b>	<b>Duration</b>	<b>Life/Injury</b>	<b>Property</b>
<b>Todd County</b>	Highly Likely	None to Minimal	Limited	Negligible	More than 24 hours	Minimal	Limited

Local residents, schools, areas businesses, government facilities and medical facilities are most prone to the effects of computer viruses occurring within the County.

Plans, Programs & Policies

- Todd County MIS
- Back-up Strategies

*3.3.8 Railroad Interference with Emergency Response*

Found within the City of Staples is a rail line that splits the city in half. This is a concern that has been identified by Todd County as an existing hazard. The main hazard identified by the County is that emergency response vehicles may not be able to respond as quickly as needed for the section of the city, south of the railroad tracks.

History

To this date, there is no documented history of loss of life due to emergency response vehicles being restricted access to an emergency scene from train activity.

Risks & Vulnerabilities

**Table 3-33**

	<b>Frequency</b>	<b>Warning Time</b>	<b>Impact</b>	<b>Area</b>	<b>Duration</b>	<b>Life/Injury</b>	<b>Property</b>
<b>Todd County</b>	Likely	None to Minimal	Limited	Negligible	Less than 1 hour	Minimal	Minimal

The City of Staples has been identified as being the most prone to this occurrence within Todd County.

Plans, Programs & Policies

- Mn/DOT
- BNSF
- County Highway Department
- Transportation Planning
- Local police, fire, emergency medical