

HAZARD ANALYSIS AND MITIGATION

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HAZARD ANALYSIS AND MITIGATION

A. PURPOSE:

The Portage County Hazard Analysis identifies those hazards that have or could occur in Portage County. It includes a description of each hazard, its frequency of occurrence, and actions being taken to mitigate the hazard. These hazards are the basis for the development of all county emergency management plans.

Mitigation activities will be emphasized in this section as a major component of overall emergency management. Mitigation or prevention activities reduce the degree of long term risk to human life and property from natural and technological hazards. The cooperation of government, private, and voluntary agencies is essential in mitigation efforts.

B. HAZARD ANALYSIS POLICIES

The following section describes both the State and Portage County hazard analysis policy.

1. STATE HAZARD ANALYSIS POLICY

The Wisconsin Emergency Management (WEM) develops and maintains the Hazard Analysis for the State of Wisconsin. The State Hazard Analysis describes all hazards which have or are most likely to occur, including their frequency of occurrence, potential impacts, and suggested actions to mitigate the hazard. It is the basis for the development of all emergency management plans.

The State Hazard Analysis is updated and distributed on a biennial basis to county emergency government directors and other emergency management participants.

2. COUNTY HAZARD ANALYSIS POLICY

The Portage County Emergency Management Director develops and annually updates a listing of all hazards which have or could occur within the county. The listing includes the definition, frequency of occurrence, and actions to mitigate the hazard.

C. COUNTY HAZARDS:

The following is a listing of all potential hazards that could affect Portage County at any time;

C.1. AGRICULTURAL/HYDROLOGIC DROUGHT

a. Definition and Physical Characteristics

Two types of drought occur in Wisconsin--agricultural and hydrologic. Agricultural drought is a dry period which reduces crop yields. Hydrologic drought, on the other hand, is a dry period of sufficient length and intensity to affect lake and stream levels and the height of the groundwater table. These two types of drought may, but do not necessarily, occur together.

Drought conditions may vary from below normal precipitation for a few weeks to severe lack of normal precipitation for a couple of months. Agricultural areas are primarily affected by drought since the amount and timing of rainfall has a significant impact on crop production. Therefore, the severity of a drought cannot be completely measured in terms of precipitation alone but must include crop yields.

b. Frequency of Occurrence

Drought is a relatively common phenomenon in Wisconsin and has occurred statewide in 1895, 1910, 1939, 1948, 1958, 1976 and 1988. Portage County suffered severe crop yield decline and many wells dried up in the 1976 drought. The average annual rainfall for Portage County is 32.6 inches.

Portage County Occurrences

<u>Annual Rain</u>	<u>Description</u>
2001 34.79	Wet April, May, June. Hot, Dry July
2002 35.55	Wet May, June 9" rainfall event on June 22. Hot, dry July
2003 27.40	Overall, dry for the year
2004 31.29	Cool, wet summer
2005 29.65	3" deficit, Dry spring, normal summer, fall and winter started wet
2006 28.60	3.5" deficit during 2006. Very wet May and December.
2007 28.96	3.17 "< normal. Jan-Mar > normal. Apr-July < normal. Sept & Nov. experienced largest deficit.
2008 30.07	2.06" < normal. First 6 months 3.23" above normal. July-Nov. dry
2009 31.5	0.6 < normal. Aug. & Oct. very wet. Other months were very dry.
2010 42.6"	10.5 > normal. Jan. through May < normal. June, July & Sept. very wet with significant flooding. Balance of year near normal.

c. Actions to Mitigate

Portage County Planning and Zoning Department has the primary responsibility for establishing specific guidelines on well depth. To mitigate the effect of hydrologic drought the following actions are being taken: identification of areas with potential ground water level problems and inspections of wells in those areas for adequate depth and construction. Numerous Portage County communities have also adopted water usage regulations during drought conditions.

Portage County farmers may contact the Portage County Extension Office and/or the Farm Service Agency (FSA) for information and guidance related to drought. Various federal and state publications are available from these agencies on ground water movement, the hydrologic cycle, and irrigation methods. These agencies will also be the lead agencies in obtaining emergency food and water supplies for agricultural use.

C.2. CIVIL DISTURBANCES

a. Definition and Physical Characteristics

Civil disturbance is any act by an individual or group of persons with the intention to agitate or cause a public disturbance. These disturbances may come in the form of labor disputes or protests by groups on a special issue.

b. Frequency of Occurrence

Portage County has been a low probability area for civil disturbances. Labor strikes have occurred in the past but have been generally peaceful and lacking in hostile actions. These labor strikes have occurred at contract time by truckers, state employees, and local businesses.

Prank bomb threats have been called in to a number of the schools and businesses. To date, there has never been a bomb discovered.

Threats against government officials and others in top positions are generally made by persons who feel they have been unjustly wronged. So far in Portage County these threats have never been carried out.

c. Actions to Mitigate

In a pending labor situation, the local sheriff or police chief will meet with strike leaders to set up conduct guidelines for a lawful strike. Law enforcement officials should also review mutual aid pacts for additional support.

Bomb threat policies and procedures will be developed for each school, hospital, business, and government building. A number of these have already been developed with Portage County Emergency Government's guidance. Each bomb threat will be treated on a case-by-case basis.

By Portage County Ordinance #1.5 Regulation and Licensing of large Assemblies, involving 300+ people, lasting 8 or more hours, are required to obtain event permits to minimize disturbances. Law Enforcement agencies will also use intelligence information when possible to gain advance data on potential problems. Current lists of phone numbers for agencies that can respond are available in the emergency dispatch center. If necessary, the Sheriff will call for Mutual Aid if the disturbance exceeds the capabilities of the local law enforcement agencies.

C.3. DAM FAILURES

a. Definition and Physical Characteristics

Portage County has 69 dams and most of them are the "mill" types which were built more than fifty years ago. There are also small dams for watering livestock and various recreational ponds around the county. Portage County also has two electric power generating dams.

If any of the mill type dams failed. The runoff would hardly be noticed downstream. However, electric power generating dams within the county are the greatest concern, but consistent maintenance keeps them in good shape.

b. Frequency of Occurrence

To date no dam failures have been documented at the hydro-electric dams.

"Mill" dams have developed holes on occasion but have not caused any flooding problems.

During the high water situation of 1993, the earthen berm at Jordan Park began to seep. During 1995, measures were taken to reinforce and repair the berm. Also, repair to the gates has been completed.

c. Actions to Mitigate

Consolidated Water Power Company has developed Emergency Action Plans (EAPs) for The Dubay and Stevens Point Hydroelectric power dams which are updated annually. Copies of the plans and the updates are located in the County Sheriff's Department (2), Portage County Emergency Management Office (1), Stevens Point Police Dispatch Center (3), Stevens Point Public Works Department (1), Portage County Highway Department Office (1), Stevens Point Fire Department (2), and the Northeast Area WEM Office (1). Included in the plans are the warning procedures, maps indicating areas that could be expected to flood, and other information to be used during a flooding event. FERC (Federal Energy Regulatory Commission) requires a tabletop and functional exercise of these dams on a five-year cycle. During 2010 NewPage Inc. has partnered with Portage County for CodeRed utilization for notification in the event of a potential dam failure.

Wisconsin Valley Improvement Company (WVIC) has developed an Emergency Action Plan (EAP) for the Eau Pleine Reservoir. This plan is updated annually. Copies of the plan and the updates are available in the Emergency Management office. FERC requires the same exercise cycle as listed above.

The Portage County Emergency Management Office maintains EAPs for the following dams:

Eau Pleine Reservoir

DuBay Hydroelectric Dam

Stevens Point Hydroelectric Dam

Jordan Dam (Big Plover River)

Springville Dam (Village of Plover)

Whiting Dam (Village of Whiting)

Mitigation by Portage County Emergency Management has been limited to expanding the warning system and developing evacuation procedures for those persons in areas that may be flooded. This includes road closing and rerouting of traffic to keep people out of the danger areas.

C.4. EARTHQUAKES

a. Definition and Physical Characteristics

An earthquake is a shaking or trembling, sometimes violent movement of the earth's surface that follows a release of energy in the earth's crust. Geologists use the term "earthquake" to name what happens when rocks slip suddenly along a crack in the earth, called a fault.

Vibrations produced by earthquakes can be detected, recorded, and measured by instruments called seismographs.

Earthquakes of large magnitude do not necessarily cause the most intense surface effects. The effect in a given region depends to a large degree on local surface and subsurface geologic conditions. If an earthquake happens to occur beneath a heavily populated area, the loss of life and property may be very great.

b. Frequency of Occurrence

Little earthquake activity has occurred in Wisconsin. In general, considerable attention has been focused on seismic activity in the Midwest and in particular, on activity along the New Madrid Fault in Missouri. A severe earthquake occurred there in 1811 and the area has since that time continued to be seismically active. However, because no severe earthquakes have occurred in this fault zone since 1895, many people in the Midwest are unaware of their damage potential.

c. Actions to Mitigate

While the earthquake threat to Wisconsin as a whole is not great, it is imperative that local officials be aware of any potential threat for their particular area. Once that determination has been made, then appropriate response plans can be developed for minor, moderate or major impacts of a quake. If necessary, building codes and safe land use practices should be established and enforced. Also, existing structures, particularly public buildings used by large numbers of people, should be inspected to ascertain whether they can be made "earthquake safe".

Local officials should also conduct public information programs to provide their constituents with adequate information on the probability of an earthquake occurrence and its effects.

C.5. **EXPLOSIONS**

a. Definition and Physical Characteristics

An explosion is a sudden release of a large amount of energy accompanied by shock and pressure waves. A very rapid fire can also be an explosion. For example, when gasoline is mixed with air in the proper proportions and ignited, the burning is extremely rapid, causing expansion of heated products and combustion that creates shock waves.

b. Frequency of Occurrence

The threat of an explosion exists on a daily basis in Portage County. Large volumes of explosive material are stored, transported, and used on a routine basis by both business and private sector consumers. When explosive material is mishandled or involved in an accident the results can be disastrous. In a worst case scenario, incidents involving explosive materials could involve hundreds of Portage County residents.

Date **Location**

Description

4/98 Village of Plover

On Line Packaging, Inc., no injuries, moderate damage to factory building and contamination to soil. Explosion caused by employee adding unknown chemical to wastewater solution.

c. Actions to Mitigate

Portage County has local plans and response procedures for use in case of a serious explosion. Training for local response agencies has been provided by federal, state, county, and private sector agencies such as Federal Emergency Management Agency (FEMA), State WEM, Portage County Emergency Management, Department of Natural Resources (DNR), and others. Fire and police personnel have had special training in handling this type of hazard.

C.6. FIRES: FOREST

a. Definition and Physical Characteristics

The forest fire season in Portage County begins in March and continues through November. Forest fires can occur at any time of day during any month of the year. Generally, forest fires are more likely to occur whenever vegetation is dry as a result of a winter with little snow or a summer with sparse rainfall.

DNR is responsible for forest fire protection on approximately 18 million acres of forest and wild land in Wisconsin. The U.S. Forest Service maintains forest fire protection on two million acres of this land while local fire departments retain responsibility for the remaining wooded acreage.

b. Frequency of Occurrence

While the number of project forest fires involving multiple agency response has decreased over the years, the potential for catastrophic fires has increased. Due to the rapid spread of permanent and seasonal homes and subdivisions into rural wooded areas of the County, the possibility of disastrous conflagration is rapidly climbing. Our record low for fires was 1962 with 21 fires that burned 57 acres. Our record high for fires was 1976 with 138 fires which burned 5215 acres.

According to DNR records at the Whiting Ranger Station, 489 forest fires have burned 946 acres of land over the past ten years. Forest fires ten-year summary below. During 2010 most significant fire occurred on April 1st in the Town of Dewey burning 20 acres.

Year	Number of Fires	Acreage Damaged
2001	39	30
2002	36	45
2003	99	197
2004	38	141
2005	68	250
2006	45	35
2007	56	32
2008	26	39
2009	48	132
2010	34	45
Totals:	489	946

c. Actions to Mitigate

The DNR and local fire departments train together to develop safe, aggressive fire fighting tactics in the wild land/urban interface environment. Cooperative training has been an important part of the County fire control program. The DNR maintains a current fire action plan for the County and is kept on file at the Ranger Station and in the ranger's Initial Response Unit. Recent and ongoing radio upgrades will help open channels of communication during ongoing incidents involving multiple, mutual aid agencies. The Portage County Fire Chief's Association meets bi-monthly to discuss issues of concern as a means to improve emergency services to County residents.

Portage County has a well-balanced forest protection organization. This includes public information programs which operate on a year-round basis that reaches all sectors of the public. The DNR conducts annual school programs targeting elementary students throughout the County on wild land fire prevention. Local fire departments conduct programs on structural fire prevention within their own jurisdictions. In addition, both DNR and local departments conduct ongoing public relations campaigns using all forms of media in the County. Additionally, aggressive law enforcement of local regulations and state fire control laws help deter unsafe burning practices in the County.

C.7. FIRES: STRUCTURAL

a. Definition and Physical Characteristics

Structural fires typically involve buildings that have more than one floor and are designed for multiple businesses or resident occupancy. Usually these fires occur in metropolitan and urban areas. The consequences can be severe with loss of property, income, and in some cases, lives. These fires can impact large numbers of people and require special planning and response efforts. Our definition of a structural fire would be one that would effect a business or place of business, or any structure designated for human occupancy.

b. Frequency of Occurrence

Portage County has one major population center, Stevens Point, where large numbers of people would be affected if a structural fire occurred. The Village of Plover and it's fire service area would be the second largest population center. Portage County has few multi-story buildings. The following chart identifies reportable structural fires that have occurred in Stevens Point and the Village of Plover fire service areas over a period of years.

Structural Fires Reported in the City of Stevens Point

1994	41	1995	53	1996	46	1997	44
1998	33	1999	28	2000	37	2001	43
2002	34	2003	36	2004	39	2005	36
2006	21	2007	20	2008	16	2009	23
2010	14						

Structural Fires Reported by Village of Plover Fire Dept.

2002	10	2003	11	2004	14	2005	9
2006	12	2007	22	2008	17	2009/Plover	18
2010/Plover	4	2010/Metro	7			2009/Metro	7

c. Actions to Mitigate

All Portage County fire departments participate in a countywide mutual aid agreement ensuring compatibility between responding agencies. A statewide fire network frequency and communication system with other fire departments has also been established. All fire departments check pre-fire response plans and perform inspections on a regular basis. Firefighters are trained involving usual fire scenarios for local hazards on a regular basis.

During 2001 The Portage County Fire Chiefs' Association has developed and implemented a MABAS (Mutual Aid Box Alarm System). This pre-planning system identifies resources needed in the event of a variety of mutual aid fire situations. The system utilizes resources in a method that does not deplete the assets of any one fire department while mobilizing resources of multiple departments and utilizing a "move-up" system. All emergency dispatchers have received training in the utilization of the MABAS system.

C.8. **FLOODING**

a. Definition and Physical Characteristics

Flooding is defined as a general condition of partial or complete inundation of normally dry land from the overflow of inland waters, or the unusual and rapid accumulation or run-off of surface waters from any source.

Major floods in Wisconsin have, for the most part, been confined either to specific streams or to locations which receive intense rainfall in a short period of time. Flooding which occurs in the spring due to snow melt and/or a prolonged period of heavy rain is characterized by a slow buildup of flow and velocity in rivers and streams over a period of days. This buildup continues until the river or stream overflows its banks, for as long as a week or two, then slowly recedes. Generally, the timing and location of this type of flooding is fairly predictable and allows ample time for evacuation of people and property.

The type of flooding which occurs solely from surface run-off as a result of intense rainfalls is referred to as flash flooding. Flash flooding occurs less frequently in Wisconsin than flooding associated with spring snow melt. However, this type of flooding is unpredictable. For prediction and warning purposes, floods are classified by the National Weather Service into two types: those that develop and crest over a period of approximately six hours or more, and those that crest more quickly. The former are referred to as "floods" and the latter as "flash floods".

Generally, the amount of damage from flooding is a direct consequence of land use. If the ground is all ready saturated, stripped of vegetation, or paved, the amount of run-off increases, adding to the flooding.

Terms commonly used when referring to flooding are "100-year flood" and "flood plain". A "100-year flood" is defined as the flood water level which can be expected to occur or be exceeded in a given location once every 100 years. There is a one percent chance of a flood of such magnitude or greater occurring in a given year. The DNR, working with local zoning offices, has designated flood plain areas as those places where there is the greatest potential for flooding.

b. Frequency of Occurrence

Wisconsin has experienced several major floods during the last three decades. The 1973, 1986, 1993, 2002 and 2004 floods revealed that no flood plains or urban areas in Wisconsin can be considered safe from flood damages.

Portage County historically does not have a serious flooding problem. Flooding from rivers, streams and creeks has been minimal for the past 30 year period. However, there has been some localized flooding primarily caused by heavy rainfall and spring snow melt run-off.

Flood Warnings Issued by NWS:

2009 0
2010 3

Portage County Occurrences

Date Location Description

- 1983 Town of Linwood, Section 6 County II & Bear Creek
- 1983 Town of Linwood, Section 3&4 Bear Creek
- 1986 Town of Carson, Section 3, River Road
- 1986 Town of Linwood, Section 34, along Mill Creek
- 1993 Towns of Hull, Grant, Stockton, Village of Plover and other areas experienced high groundwater due to heavy spring rains.
- 1993 Areas along the Wisconsin River were affected by higher than normal river flow. Towns of Eau Pleine, Linwood, Carson, Plover etc.
- 1997 Heavy winter snow along with above normal soil moisture and lack of frost created a spring flood potential for moderate to high river flow. Portage County experienced high river flows in early April which resulted in one drowning.
- 2002 Severe storms and heavy rains totaling 5-10 inches over a two day period in June caused flash flooding in Linwood, Carson, Eau Pleine, Junction City, Plover, and other locations throughout Portage County. A Presidential Disaster Declaration was received.
- 2004 May 19- end June. Severe storms with heavy rainfall amounts caused flooding in several towns throughout the County. Specifically, Hull, Carson, Plover, Grant, Stockton, Buena Vista, Pine Grove, Village of Whiting, and the City of Stevens Point. Individual Assistance (IA) was granted by a Presidential Declaration, However, Public Assistance (PA) was denied to the municipalities.
- 2010 Unusually high amounts of precipitation during the summer of 2010 saturated soils. A heavy rainfall in late September resulted in high river flows and substantial flooding in the towns of Eau Pleine, Linwood, Carson, Plover and the City of Stevens Point. A presidential Disaster Declaration was awarded to assist in recovery efforts.

c. Actions to Mitigate

Short term actions which may be taken to lessen the effects of flooding include: issuance of early warnings through flood advisory bulletins, dissemination of instructions to the public through the media, preparation of congregate care facilities, and evacuation of people and property. Temporary protective measures such as sandbagging, protection of buildings and other structures, and cut-off of gas and electricity may also be implemented. Portage County maintains a stock of sandbags and sump-pumps to assist in flood fighting.

The current emphasis in flood mitigation is long range actions. This approach includes the adoption of proper flood plain zoning ordinances, land use planning, and promotion of the sale of flood insurance. It has been shown that flood plain management reduces the cost of damages attributed to flooding. Portage County Planning and Zoning Department enforces county zoning ordinances related to flood plains.

The Portage County Emergency Management Office disseminates public informational materials related to flooding. WEM staff monitors National Weather Service flood forecasts and the local Emergency Broadcast System (EAS) will be used to advise the public in the event of a flooding hazard.

C. 9. **HAZARDOUS MATERIALS ACCIDENTS/INCIDENTS**

a. **Definition and Physical Characteristics**

A hazardous substance or material is defined as any substance or combination of substances which may cause or significantly contribute to an increase in mortality or an increase in serious illness to human health. These include wastes of a solid, liquid, gaseous, or semi-solid form which, because of their quantity, concentration, or infectious characteristics, pose a present or potential hazard. Such substances may include but are not limited to those which are toxic, corrosive, flammable, irritants, strong sensitizers or explosives.

There is no area of the state which is immune from hazardous materials incidents or accidents. However, there are several factors which must be considered when attempting to identify the scope, magnitude, and vulnerability for incidents within specific areas of the state. One visible factor is the condition of the facility or transportation mode which handles hazardous materials. Other factors include the toxicity of the material and the potential for harm to public health.

b. **Frequency of Occurrence**

There have been numerous oil, gasoline, pesticide, acid, and other forms of toxic material spills in Wisconsin. Spills from fixed facility operations exceed incidents from transportation accidents. Eighty percent of these spills involve petroleum products.

Portage County has an extensive transportation system. The highway system includes two intersecting U. S. Highways, many state, county, and local roads. Common carrier truck lines, railroads, and an air transportation network provide freight service. Petroleum products and hazardous materials are transported across the county on a daily basis.

Hazardous materials are transported daily through Portage County by motor vehicles, train, and commercial aircraft. Transportation accidents that result in spills and require special operations could result in an evacuation.

The Department of Natural Resources investigates and documents all reports of spills, leaks or uncontrolled releases of hazardous materials. A list those incidents is maintained by the Portage County Emergency Management Director. Refer to the County Strategic Plan/Capability Assessment for more information.

c. **Actions to Mitigate**

Portage County has contracted with the Village of Whiting to provide "Operations Level" coverage for hazardous materials incidents. The contract is effective January 1, 2007 through December 31, 2009. Also, the County has contracted with Waupaca County to provide "Technician Level" coverage for hazardous materials incidents. The contract is effective January 1, 2007 through December 31, 2008.

The Portage County LEPC has developed a County Strategic Plan/Capability Assessment that details the hazards and capabilities within Portage County. County ordinances on public safety, "right-to-know," and compensation for hazardous material emergency responses have also been formulated.

The Stevens Point Fire Department and the Village of Plover Fire Department has trained their emergency response personnel in Confined Space Rescue operations.

The Portage County Local Emergency Planning Committee (LEPC) has developed and updated 41 Off-Site Specific Hazardous Materials Response Plans for County facilities that use store or manufacturer hazardous materials.

C.10. MASS CASUALTIES

a. Definition and Physical Characteristics

An incident that overwhelms the capabilities of local responding agencies can be categorized as a MCI incident. Also, when an incident requires the response of several different emergency response services the incident can be defined as a MCI incident. These casualties may result from any natural hazard or technological incident.

b. Frequency of Occurrence

The frequency of mass casualties occurs more often in urban areas. The following is a partial list of past incidents.

Portage County Occurrences:

<u>Date</u>	<u>Location</u>	<u>Description</u>
9/88		11 victims, School Bus Accident, all minor injuries
11/91	Stevens Point	72 victims of carbon monoxide poisoning
2/92		Stevens Point 30 victims of carbon monoxide poisoning Briggs Street High Rise
3/99	Stevens Point	11 victims, Holiday Inn, chemical reaction from Muriatic Acid added to whirlpool hot tub.
6/02	Town of New Hope	10 victims of a two vehicle, head-on crash. Two fatalities and eight critically and seriously injured victims. Emergency response from Iola Fire & Rescue, PC Sheriff's Dept., PC Ambulance, Theda Star Helicopter, County Coroner
8/07	Town of Grant	4 victims of a two vehicle crash. Communications, leadership & safety issues were identified.
9/07	Stockton	10 victims, 3 vehicle crash, 3 fatalities. response units included 3 helicopters, 2 EMS agencies, 2 EMS first responder agencies, 2 fire/rescue departments, 2 law enforcement agencies & Coroner.

c. Actions to Mitigate

Portage County Emergency Management, City and County emergency service responders, hospital emergency staff, and various other agencies are in the process of developing a County multi-casualty response plan to deal with this issue. The plan will be used in the event of a multi-casualty/multi-agency incident. Saint Michael's Hospital will coordinate with responding agencies and hospitals to ensure the best utilization of services and the least loss of life or injury from the disaster situation. The County EMS system, at the discretion of the Medical Director and EMS Service Director will implement post incident Peer Review, Quality Assurance activities for multi-agency, multi-victim incidents.

The Portage County Ambulance Service, operated by the Stevens Point Fire Department, provides ALS service to the entire County. The five fully equipped ambulances are operated by EMT's and Paramedics. Amherst Ambulance has one unit and operates as an IV Tech level serving four towns and two villages in the eastern portion of the County. Higgins Ambulance Service provides IV Tech level ambulance service to a portion of the Town of Grant. The Portage County Ambulance Service has written mutual aid agreements with all contiguous services that may respond in the event of a disaster.

Saint Michael's Hospital, Aspirus, St. Joseph's St. Clare's Riverside, and Good Samaritan Hospital participate in the Central Wisconsin Disaster Management Plan. These hospitals have developed mutual aid agreements for transferring patients during any MCI incident.

Portage County Emergency Management plans and coordinates hospital disaster exercises periodically. City and County emergency response personnel and volunteers agencies participate in these exercises.

C.11. NUCLEAR ENERGY/POWER PLANT INCIDENTS

a. Definition and Physical Characteristics

Nuclear energy provides a higher percentage of Wisconsin's electrical load than it does in any other state. Response planning for four reactors in Wisconsin and four reactors in close proximity to the state have been given high priority.

Nuclear power plants are fueled by Uranium 235, a radioactive isotope of uranium. This fuel is stored in rods and placed within the reactor core. Fission, splitting the atom of uranium, produces heat. This heat is absorbed by the water coolant surrounding the fuel rods. Depending on the type of light-water reactor, the hot water is transferred to a turbine to produce electricity, as in a boiling water reactor (BWR), or the hot water heats a secondary water system which powers the turbine, as in a pressurized water reactor (PWR).

Hot water from the core of the PWR and BWR is radioactive. In the PWR, a secondary water system keeps the pressurized radioactive water within the core housing. The secondary system is not radioactive. In the BWR, the radioactive water goes directly to the turbine which is sealed to prevent radioactive leaks.

A core meltdown is the most serious outcome of a nuclear accident, although it is not possible for fuel of this nature to explode like an atom bomb. Two other risks associated with nuclear energy should also be considered. These are transportation of radioactive fuel and wastes to and from the plants; and interim and terminal storage of radioactive wastes.

b. Frequency of Occurrence

Since 1957, U.S. nuclear power plants have had one major accident at Three-Mile Island near Harrisburg, Pennsylvania. Other minor incidents have occurred throughout the states but have caused few off-site consequences. However, a major incident did occur at the Chernobyl nuclear reactor in the Soviet Union in April of 1980.

Storage of radioactive waste from the power plants usually is on-site, but shipments of radioactive waste material do pass through Wisconsin on their way to southern Illinois and Washington. Containers that transport radioactive materials have been engineered to withstand tremendous extremes in shock, penetration, temperature, and water immersion without loss of integrity. Up to this point, there has not been a materials spill in this state, but accidents could occur and should be planned for.

c. Actions to Mitigate

Portage County is not located near a nuclear power plant, therefore generic mitigation tactics will be implemented.

All nuclear power plants have built-in safety devices and backup systems. One example is called scram, a protection system against excessive reactivity or runaway. Reactors have two independent scram systems. These systems utilize control rods, which obstruct the flow of neutrons in the core. When these are inserted, the reactors shut down. The emergency core cooling system keeps the fuel rods and core covered with coolant in case of a "loss of coolant" accident.

Effective response to a nuclear power plant off-site emergency requires a comprehensive joint planning effort by plant management, affected local governments, and state and federal emergency agencies. Responsible authorities must be able to assess the severity of the emergency and execute necessary emergency plans and procedures. These plans include notification of all emergency services at all levels, giving warning and self-protection information to the public, and implementation of emergency response services.

State and affected counties as well as each nuclear power plant are required to develop and keep current a radiological emergency response plan which is subject to federal approval. Federal regulations also require that each plan be tested on a biennial basis, with the federal government, evaluating the effectiveness of this plan. Radiological emergency response plans are updated quarterly.

C.12. **POWER OUTAGES**

a. **Definition and Physical Characteristics**

A utility emergency usually means a power or natural gas outage or a fuel shortage caused by an oil embargo, power failure or natural gas shortage.

Modern society is very dependent on electrical power for normal living. Most power outages last about fifteen minutes to one hour. If longer, the utilities will inform local public safety agencies and news media and public safety agencies of the duration of the outage.

Severe summer weather or severe winter weather can cause power outages. Fuel shortages can also cause imbalances in supply resulting in power outages.

b. **Frequency of Occurrence**

Portage County has experienced one major power outage in the summer of 2001 where portions of the County were without power for more than three days due to a severe wind event. In December 2006 widespread power outage because of heavy snow and ice. The outage lasted 3-4 days

c. **Actions to Mitigate**

Portage County has been working directly with the utility companies and emergency responders in formulating emergency management plans. During a fuel and/or power shortage residents, schools, industry, and businesses will be asked to take measures to conserve fuel. If the fuel shortage reaches the critical stage, all non-essential facilities will be closed down and contingency plans put into effect.

Portage County may have access to a limited number of generators available in adjacent counties through the Emergency Management offices.

Some businesses within the County have emergency power sources available. The hospital and nursing homes have alternate power sources available to provide critical services in the event of a power outage.

Evacuation and shelter plans have been developed in the event of a serious power outage.

C.13. PRISON DISTURBANCES

a. Definition and Physical Characteristics

Portage County does not have a maximum-security prison located within the county. The County jail houses maximum security, huber and juvenile inmates. The current capacity is 97 beds.

Over the years there has been an overcrowding of inmates and a shortage of available beds for females and juveniles. Portage County has constructed a new County jail, which was completed in January of 1991.

b. Frequency of Occurrence

The following jail/prison disturbances have occurred in Portage County:

Portage County Occurrences

Date	Description
1982	Jail Escape
1987	Jail Escape involving 3 inmates
2005	Attempted jail escape from Juvenile Detention Center
2007	Attempted jail escape from Juvenile Detention Center (2 males)

c. Actions to Mitigate

Portage County has opened and maintained lines of communications between prison personnel and emergency management services in the county. Corrections Officers and responding personnel have been trained in special classes and workshops on how to respond to a jail/prison disturbance. Additional security measures have been taken to reduce the possibility of future jail escapes. Also, visitation of inmates has been reduced and is monitored on a regular basis.

C.14. STORMS: HAIL

a. Definition and Physical Characteristics

Studies of thunderstorms indicate that two conditions are required to develop a hailstorm: sufficiently strong and persistent up-draft velocities; and liquid water accumulated in a super cool state in the upper parts of the storm. Injury and loss of life are rarely associated with hailstorms. However, extensive property damage is possible, especially to crops.

Hail ranges in size from barely visible particles to grapefruit- sized dimensions. Hail may be spherical, conical, or irregular in shape and fall in swaths which may be from twenty to one hundred miles long and five to thirty miles wide. A hail swath is not a large continuous path of hail, but generally consists of a series of hail cells which are produced by individual thunderstorm clouds traveling in the same general area.

b. Frequency of Occurrence

Wisconsin averages two or three hail days per year. Hailstorms usually occur from May through August. Most of the hail damage is in the rural areas as these four months also correspond to the growing and harvesting seasons for most crops. Specific data on dates, location and description of hail damage for Portage County is not available.

c. Actions to Mitigate

Insurance is the most widely used adjustment for crop and property damages due to hail. Hail crop insurance is available from two sources: commercial stock and mutual companies, and Federal Crop Insurance Corporation (FCIC). Farmers rarely purchase insurance coverage up to the full value of the losses that would result from a severe hailstorm.

The county extension agent and Farm Credit Services office distributes information on various hail insurance options. In the event of major damage, the Portage County Extension Agent and county and federal agricultural agency representatives, will have primary responsibility for documenting hail damage.

Federal emergency assistance is available in the form of low-interest loans when a Presidential Disaster is declared or when the FmHA declares a county eligible for aid. Damage from hailstorms alone is generally not extensive enough to invoke a disaster declaration.

C.15. **STORMS: LIGHTNING**

a. Definition and Physical Characteristics

Lightning is a phenomenon associated with thunderstorms. Lightning may proceed from cloud to cloud, cloud to ground, or if there are high structures involved, from ground to cloud. The temperatures in the lightning stroke rise to 50,000 degrees Fahrenheit. A sudden and violent discharge which occurs in the form of a lightning stroke is over in a millionth of a second.

Lightning damage occurs if humans and animals are electrocuted, fires are caused by a lightning stroke, or sudden power surges cause damage to electrical or electronic equipment. Lightning kills more persons each year than hurricanes or tornadoes.

b. Frequency of Occurrence

Nationwide, forty-five percent of the persons killed by lightning have been outdoors, about sixteen percent occurred under trees, six percent on heavy road equipment, and thirty-three percent at various unknown locations. Less than ten percent of the deaths involve individuals inside buildings. These are primarily due to lightning-caused fires.

Wisconsin has a high frequency of property losses because of lightning. Insurance records show that annually one out of every fifty farms have been struck by lightning or have had a fire which may have been caused by lightning. Generally, rural fires are more destructive than urban fires because of limited lightning protection devices, isolation, longer response times, and inadequate water supplies. Specific data on dates, locations, property damage, injuries or deaths in Portage County from lightning are not available.

c. Actions to Mitigate

The two primary ways to effectively reduce lightning losses are protection of structures and modification of human behavior. Damage can be reduced through the use of fire resistant materials when constructing buildings.

The Portage County Emergency Management Office has awareness/educational materials to inform the public of safety procedures to follow regarding the lightning hazard. Severe summer weather safety information is also emphasized during Tornado Awareness Week.

C.16. **STORMS: THUNDERSTORMS**

a. Definition and Physical Characteristics

There are three distinct stages of development for thunderstorms: birth, growth, and maturity. In the first stage of development, an up-draft drives warm air up beyond condensation levels where clouds form. The second stage of development occurs as water vapor in the expanding cloud is raised to saturation levels, the air is cooled sufficiently to form solid and liquid particles of water, and rain or snow begins to fall within the cloud.

A thunderstorm's mature stage is marked by a transition of wind direction within the storm cells. The prevailing up-draft, which initiated the cloud's growth, is joined by a down-draft generated by precipitation. Lightning may occur soon after precipitation begins. Hail and tornadoes may also develop during this stage.

A thunderstorm often is born, grows, reaches maturity, and dies in a thirty-minute period. The individual thunderstorm cell travels frequently between thirty and fifty miles per hour. Strong frontal systems may create one squall line after another composed of many individual thunderstorm cells. These fronts can often be tracked across the state from west to east with a constant cycle of birth, growth, maturity, and death of individual thunderstorm cells.

b. Frequency of Occurrence

Thunderstorm frequency is measured in terms of incidents observed per day. Wisconsin averages between thirty and forty-five thunderstorms per year. In Portage County, there are typically seven severe thunderstorms per year. Thunderstorms can occur throughout the year, with the highest frequency during the months of May through September. The majority of the storms occur between the hours of noon and midnight.

Portage County Occurrences

Number of Severe Thunderstorm Watches/Warnings

1988	6/4	1989	5/4	1990	11/2	1991	7/4
1992	6/9	1993	6/3	1994	9/5	1995	16/9
1996	5/8	1997	4/7	1998	9/13	1999	10/5
2000	10/5	2001	3/7	2002	11/8	2003	8/2
2004	6/10	2005	8/7	2006	9/9	2007	8/8
2008	5/10	2009	2/3	2010	8/10	2011	

c. Actions to Mitigate

The Portage County Emergency Management Office has developed and disseminates severe weather safety information to the public annually. During Tornado Awareness Week there is extensive media campaign about severe weather. Additionally, the EM department offers severe weather spotter training presented by the National Weather Service (NWS).

Portage County also promotes early warning of the public and has established a local EAS.

C.17. **STORMS: TORNADOES**

a. **Definition and Characteristics**

A tornado is a violently rotating column of air. It is funnel-shaped. The lower end of the column may or may not touch the ground. Average winds in the tornado are between 175 and 250 miles per hour and may produce winds exceeding 300 miles per hour. It typically produces damage in an area that does not exceed one-fourth mile in width or sixteen miles in length. Tornadoes with track lengths greater than 150 miles have been reported, although such tornadoes are rare.

Tornadoes are visible because low atmospheric pressure in the vortex leads to cooling of the air by expansion with condensation and formation of water droplets. They are also visible as a result of the airborne debris and dust associated with the vortex. The destructive power of the tornado lies primarily in its high-wind velocities and sudden changes in pressure. Wind and pressure differential probably account for ninety percent of the damage in most cases. Since tornadoes are associated with storm systems, hail, torrential rain, and intense lightning usually accompany them.

b. **Frequency of Occurrence**

Wisconsin lies along the northern edge of the nation's tornado belt which extends north-eastward from Oklahoma into Iowa. Winter, spring, and fall tornadoes are more likely to occur in southern Wisconsin than in northern counties. Yet, tornadoes have occurred in Wisconsin during every month except February.

Wisconsin's tornado season runs from the beginning of April through September. The most severe tornadoes typically occur during April, May, and June. Many tornadoes strike in late afternoon or early evening. However, tornadoes have occurred at other times. Personal property damage, deaths, and injuries have and will continue to occur in Wisconsin.

Portage County has had a total of 26 recorded tornadoes, 17 tornadoes from 1950 to 2001. Tornado disasters can occur in all parts of the state or Portage County. In 1956 Portage County experiences a tornado which passed through Bancroft and Amherst killing two and injuring seven. Also, in 1908 the City of Stevens Point experienced a tornado killing one person and injuring two. Most recently, 1992, the County was struck by three tornadoes with no injuries or deaths reported.

On June 7, 2007 Wisconsin experienced fast moving super-cell thunderstorms with damaging winds, hail larger than 5 inches in diameter, and tornadoes that ripped across central and northeast Wisconsin. Five tornadoes touch down in central and northeast Wisconsin. Portage County experienced only minor damage.

Number of Tornado Watches/Warnings

1990	6/0	1991	2/0	1992	3/1	1993	3/2
1994	6/1	1995	2/0	1996	7/2	1997	3/2
1998	9/0	1999	2/0	2000	1/1	2001	3/1
2002	1/0	2003	1/0	2004	3/2	2005	5/1
2006	0/0	2007	3/1	2008	3/0	2009	0/0
2010	2/2						

c. Actions to Mitigate

An effective warning system is the single most important source to alert the public to a tornado hazard. However, forecasting of tornadoes is difficult because of the suddenness of their onset and their relatively short duration, the extreme variability of a tornado striking area, limited knowledge of tornado dynamics, and the limitations of the weather observing system.

During the past several years, there has been a statewide Tornado Awareness Week in April. Media information packets are distributed to re-emphasize safety precaution, alert procedures and inform the public about the affect of severe weather. Portage County actively promotes tornado safety public information as well as other summer severe weather public awareness/educational efforts. Portage County also assists the National Weather Service in sponsoring tornado spotter training and organizing local tornado spotter networks. There are more than fifty trained weather spotters in Portage County.

Portage County Emergency Management staff assists personnel in schools and businesses, public facility managers, and individuals in determining "best available" tornado safety areas.

Efforts have been made to improve mobile home safety in windstorms and tornadoes. Besides public education efforts Portage County Zoning ordinances require tie-downs in mobile home parks. The Village of Plover has adopted a policy that designates their Municipal Building as a severe weather shelter for mobile home occupants.

Portage County has a variety of warning devices/methods. The county-wide outdoor warning siren system is comprised of twelve sirens. This system will reach approximately 35-50% of the citizens. This system is tested every Saturday morning at 11:00 A.M. throughout the year.

Portage County has developed a local severe weather Emergency Alert System. In addition, the County has weather alert radios placed in schools, hospitals, nursing homes, senior centers, radio stations and various businesses and most County owned buildings. A total of 60 radios are in place (see Annex B for a list of locations).

During 2003 Portage County, through a pre-disaster mitigation grant, purchased and distributed 150 Weather Alert Radios to special needs facilities including child care centers, elderly housing facilities, camps and campgrounds, parks, and resident of mobile homes.

C.18. STORMS: WINTER

a. Definition and Physical Characteristics

Winter storms include a variety of weather phenomena. Wisconsin residents are most familiar with heavy snow storms, blizzards, sleet, and ice storms. The winter storm season generally runs from November to March in Wisconsin.

A snowfall and accumulation of four or more inches in a twelve- hour period is considered a heavy snowfall. The majority of Wisconsin snowfalls are between one and three inches per occurrence. However, heavy snowfalls which produce at least ten inches may occur four or five times per season.

A storm with sustained wind speeds in excess of thirty miles per hour accompanied by heavy snow or large amounts of blowing or drifting snow is classified as a blizzard. Northwestern Wisconsin encounters more blizzards than southeastern portions of the state.

An ice storm occurs when rain, falling out of the warm and moist upper layers of the atmosphere, comes into contact with a cold and dry layer near the ground. The rain freezes on contact with the ground and accumulates on exposed surfaces. If a half inch of rain freezes on trees and utility wires, damage can occur, especially if accompanied by high winds. In contrast, a sleet storm involves frozen rain drops of pellets which do not cling to surfaces. An accumulation of these pellets can make driving hazardous.

b. Frequency of Occurrence

Snowfall in Wisconsin varies between thirty inches in southern counties to one hundred inches in the north. Storm tracks which originate in the southern Rockies or Plains states and move north-eastward produce the heaviest precipitation (typically six to twelve inches). Meanwhile low-pressure systems originating in the northwest (Alberta) tend to produce only light snowfalls (generally two to four inches). Those snowfalls associated with the Alberta lows occur more frequently with colder weather.

Although massive blizzards are rare in Wisconsin, blizzard-like conditions often exist during heavy snowstorms when gusty winds cause blowing and drifting of snow. A storm is not considered a blizzard unless heavy storms are accompanied by sustained wind speeds in excess of thirty-five miles per hour. Near blizzard conditions existed in Wisconsin in January 1979 when record snowfalls were recorded in many areas and wind speed gusts in excess of thirty miles per hour.

Both ice and sleet storms can occur at any time throughout the winter season from November to April. Ice storms of disastrous proportions occurred in central Wisconsin in February, 1922, and in southern Wisconsin in March, 1976. A Presidential Disaster Declaration was obtained as a result of the 1976 storm.

Utility crews from surrounding states were called in to restore power which was off up to ten days in some areas. Other storms of lesser magnitude have caused power outages and treacherous highways.

Typically, Portage County experiences several Winter Storms each year. Specific data on dates, location, and description of Winter Storms for Portage County is not available.

c. Actions to Mitigate

Communities prepare for severe winter weather by ensuring that plowing and sanding equipment is operational and available to handle potential emergencies. Also, extra personnel and funding may be necessary to cover extensive overtime hours. Communication lines also need to be established between government, police, fire, EMS, hospitals, and highway departments. The Portage County Emergency Management Plan provides for coordination of public safety, support agencies (such as the American Red Cross), and resource acquisition during emergencies.

Winter safety information is prepared and distributed to the media and public by the Portage County Emergency Management Office. During a storm, the public is advised to monitor local radio, television, weather alert radio and weather forecasts. Emergency information will also be disseminated via the local Emergency Alert System.

Number of Actual Severe Winter Events by NWS:

2009	4	2010	2	2011		2012	

C. 19. **TERRORISM**

a. Definition and Physical Characteristics

Terrorism is defined as the unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof in furtherance of political or social objectives.

b. Frequency of Occurrence

Terrorism has increased in the United States and in many countries of the world. Terrorism remains a major issue among the governments of the world. The probability of a terrorism event in Portage County is slight, however, the potential exists. The events of September 11th 2001 renewed the public interest in anti-terrorism preparedness planning and training.

c. Actions to Mitigate

The responsibility for action against terrorists rests primarily with the law enforcement community, which should be aware of possible targets and agents of terrorism. Planning should be accomplished so that responding agencies can react quickly and safely to minimize any impact that would result in injury or death to involved persons.

Portage County has provided Emergency Response to Terrorism-Basic Concepts training to a limited number of emergency responders. Many training opportunities were offered during 2000-2001. Also, the Portage County LEPC has conducted a Table-Top and a functional Terrorism/Hazardous materials exercise to help acquaint emergency response agencies to the circumstances of Nuclear, Biological, Chemical agents. A functional exercise was held during 1999.

During 2001 Portage County completed the required Portage County Threat Assessment, Vulnerability Assessment and the Capabilities/Needs Assessment. Further training activities commenced in 2001. WMD Awareness training was offered to all law enforcement agencies and all fire departments during 2001 and 2002. Grants for terrorism equipment are currently being made available to Portage County agencies.

C.20. TRANSPORTATION ACCIDENTS (AIRCRAFT, RAIL, TRUCKING)

a. Definition and Physical Characteristics

Accidents involving aircraft, railroad, and trucking pose a threat to mankind and the environment either from the destruction caused by the accident itself or the accidental release of hazardous materials, cargoes, or fuels.

b. Frequency of Occurrence

Portage County's transportation accident record keeping system currently does not have the capability of identifying and distinguishing aircraft, rail and trucking occurrences from the general accident reports. Therefore, specific data on dates, locations, and description of transportation accidents in Portage County is not available. Effective March 1, 2009 Portage County has implemented a RMS (Records Management System) which will provide statistical reporting in the future.

c. Action to Mitigate

Portage County has local plans and response procedures for use in transportation accidents. Personnel from all police, fire, and Emergency Medical Services (EMS) have had training in handling these hazards. Federal, state, county, and private sector agencies such as FEMA, State WEM, Portage County Emergency Management, DNR, and many others provide this training.

During 2008 Portage County emergency response personnel/agencies established a Traffic Incident Management Committee which developed a set of guidelines for the purpose of having a uniform approach for emergency traffic control and scene management at transportation incidents. TIM training will be conducted during 2009 for the full implementation of the guidelines.

C.21. **WAR: NON-NUCLEAR**

a. Definition and Physical Characteristics

War is a state of open, armed, often prolonged conflict carried on between nations, states, or parties. Non-nuclear war is a conflict where conventional methods of fighting are used, which may include biological and chemical agents.

b. Frequency of Occurrence

The United States has been involved in numerous wars throughout its history. However, few have involved conflicts on U.S. soil. Because there are always conflicts occurring at some location in the world, many of which impact on the United States, it is possible that this country could become involved directly or indirectly in a conflict, but not on its own soil.

c. Actions to Mitigate

Efforts to reduce the probability of war or its consequences lie mostly with federal programs. Such efforts include programs such as the EAS and the NAWAS.

C.22. WAR: NUCLEAR

Many nations now have nuclear weapons and the means to deliver them. It is possible that a war against the United States may result in a nuclear attack on our continent.

When a nuclear bomb explodes, the main effects produced are: intense light brighter than the sun, heat in thousands of degrees, blast, and radiation. Explosions on or near the ground create large quantities of dangerous radioactive particles which are sucked into a fireball to form a mushroom cloud. The particles, called fallout, begin falling back to earth in thirty minutes within the first twenty-four hours. The fallout gives off invisible gamma rays, an excess of which can kill or injure people.

In a national nuclear attack, weapon size will determine the extent of the damage area. People close to the explosions may be killed by the blast and heat. A few miles away in the light damage area, most people will be endangered by the blast, and heat to a lesser degree, but will be threatened by fires and fallout. Outside of the immediate damage area, radioactive fallout will be the main danger.

The invisible gamma rays can cause radiation sickness. Large doses of gamma rays can cause death. Nonlethal doses cause sickness in varying degrees, but most victims would survive.

b. Frequency of Occurrence

The proliferation of nuclear weapons has increased the possibility of nuclear attack. Nuclear weapons would, in all probability, be delivered by missiles launched from submarines, mobile surface launchers or underground silos. United States military strategists assume the targets would be military bases, supply depots, command and control facilities and urban/industrial complexes with populations over 50,000. In Wisconsin, it is assumed by these strategists that the target areas would be Superior, LaCrosse, Madison, Milwaukee, Racine- Kenosha area, Green Bay, and the Appleton-Oshkosh area.

c. Actions to Mitigate

If there is a threat of nuclear attack, the Emergency Alert System (EAS) will be used to warn the public. Persons living in high- risk areas will be advised to leave the area if possible before the attack. Portage County residents will be asked to seek shelter with friends or relatives in low-risk areas if possible.

The Portage County EAS system will provide emergency information to residents as necessary, e.g. procedures for sheltering, transportation routes, etc.

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