

WISCONSIN

# RADIOLOGICAL EMERGENCY INFORMATION

FOR  
FARMERS,  
FOOD PROCESSORS,  
AND DISTRIBUTORS

2023 Edition



# TABLE OF CONTENTS

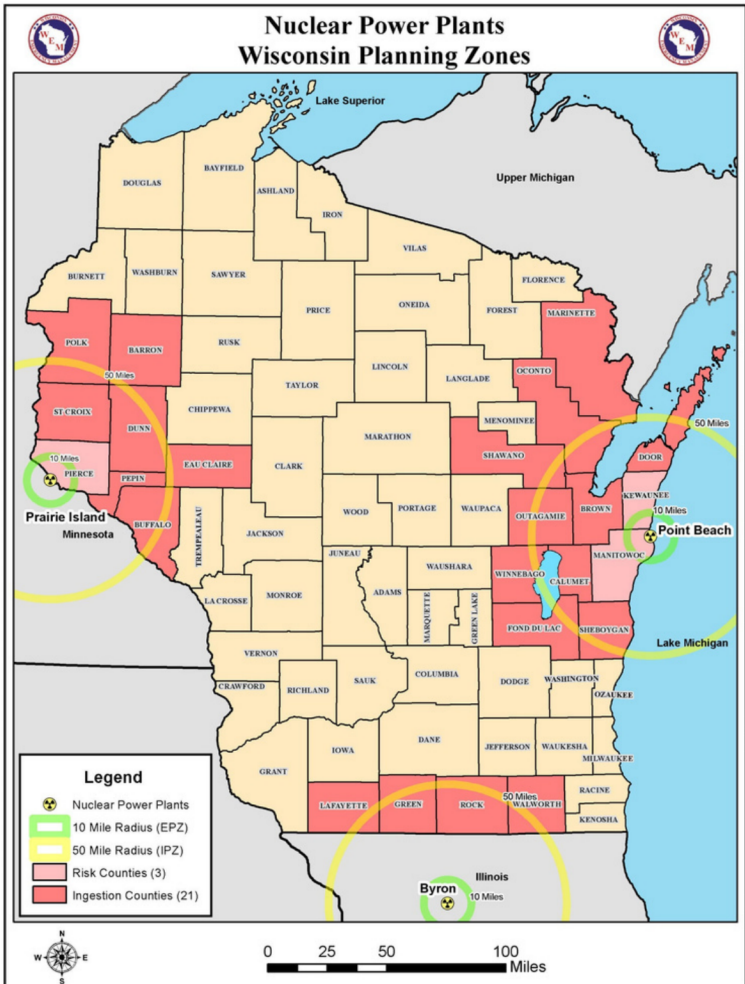


- Areas Affected ..... 2
- Emergency Planning ..... 3
- What is Radiation? ..... 5
- How You Will be Notified..... 9
- Protective Actions You Should Take ..... 11
  - To Protect Farm Animals ..... 13
  - To Protect Farm Lands and Crops ..... 15
  - To Protect Honey ..... 17
  - To Protect Fish ..... 17
  - For Food Processors and Distributors ..... 18
  - For Water Utilities ..... 19
- Post Emergency Actions ..... 20
  - Reentry ..... 20
  - Recovery ..... 21
  - Compensation for Losses ..... 21
- Contact Information ..... 23
- Emergency Plan Template ..... 24

# AREAS AFFECTED

This booklet provides information for the agriculture community within a 50-mile radius of the:

- Point Beach Nuclear Plant (Two Rivers, WI)
- Prairie Island Nuclear Generating Plant (Welch, MN)
- Byron Generating Station (Byron, IL)





# EMERGENCY PLANNING

---

In the event of an incident at a nuclear power plant resulting in a large radioactive release, one major concern is to prevent the public from ingesting food or beverages contaminated with radioactive material. Ingesting food or beverages containing radioactive material can result in cumulative internal radiation exposure to your body as you continue to consume the contaminated food or drink.

For planning purposes, an Ingestion Pathway Emergency Planning Zone covering a radius of 50 miles has been established around each nuclear power plant in the nation. The radiation levels found in the 50-radial mile area after a nuclear power plant incident will not be high enough to require evacuation of the general public. It is only within the area of 10-radial miles around the power plant that evacuation, due to higher radiation levels, may be required.

Extensive planning and exercising has been done in the 0 to 10-mile area. In the 10 to 50-mile areas around the plant, the major threat to the public will come from ingesting food and drink contaminated with radioactive material. Emergency plans have been prepared by state and county emergency management agencies to advise you of the actions you should take if the need arises to protect the food supply and to prevent ingestion of contaminated food and drink.



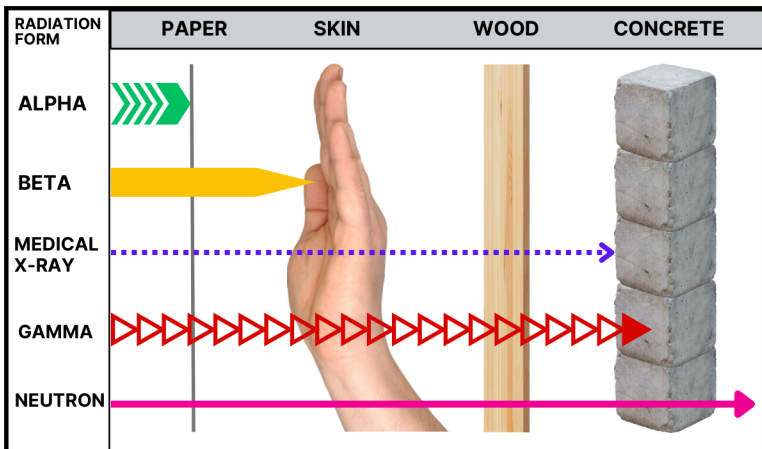
# WHAT IS RADIATION

Radiation is a form of energy.

There are different types of radiation.

The type known as "ionizing radiation" comes in the form of alpha particles, beta particles, x-rays, gamma rays, and neutrons. They can cause physical or chemical changes if it enters or penetrates humans or animals. Ionizing radiation comes naturally from a number of sources in the environment, from radioactive elements used in certain medical treatments, to the operation of a nuclear power plant.

The ionizing radiation that comes from the operation of a nuclear power plant is under control and kept within the plant. If humans or animals are exposed to a very large amount of ionizing radiation, regardless of where it comes from, they may become sick or die.





Radiation is measured in units called millirems. The millirem measures the biological effect of exposure to radiation. The effect ionizing radiation will have on you will depend upon a variety of factors including:

- How far away you are from the source of radiation
- The amount of radioactive material you inhale or take into your body

The air around us, rocks, soil, and the food we eat, naturally expose us to very low levels of ionizing radiation. Recently, we have become aware of the problems resulting from the presence of radon gas found in homes and buildings. We are also exposed to small amounts of ionizing radiation from medical and dental x-rays. Taken together, these sources of natural and man-made radiation expose us to about 360 millirems of radiation each year.

A nuclear power plant operating under normal conditions would add about 1 millirem per year to your radiation exposure if you lived across the street from the plant.

The less time you are exposed to radiation, the less chance you have of experiencing any detectable effects. The following table gives you the expected biological effects on humans from the exposure of your whole body to radiation for a 24-hour period.



# EXPECTED BIOLOGICAL EFFECT ON HUMANS\*

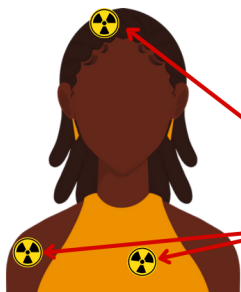
Millirems**	Effect
0 to 5,000	No detectable effect
5,000 to 50,000	Slight changes in your blood
50,000 to 100,000	Changes in your blood, nausea, and fatigue
100,000 to 200,000	Changes in your blood, nausea, fatigue, and vomiting.  Up to 1% of people exposed to this level of radiation may die if they do not receive medical treatment
450,000 to 700,000	Up to 50% of people exposed to this level of radiation may die within one month if they do not receive medical treatment

\*From the U.S. Nuclear Regulatory Commission's Nuclear Power and Radiation Workshop Manual.

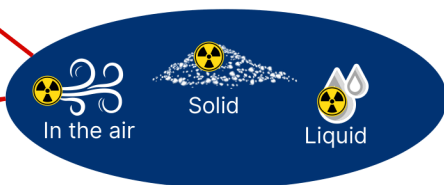
\*\*A millirem is equal to 1/1000 of a REM (Roentgen Equivalent Man). Quantities measured in REM are designed to represent the biological effects of ionizing radiation on humans.

# RADIATION CONTAMINATION VERSUS EXPOSURE

## EXTERNAL CONTAMINATION



External contamination occurs when radioactive material comes into contact with a person's skin, hair, or clothing

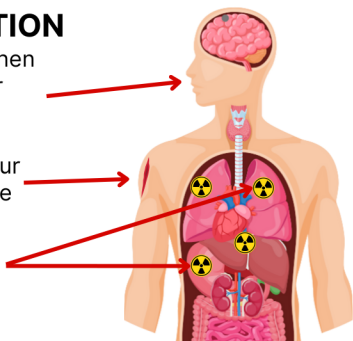


## INTERNAL CONTAMINATION

Internal contamination can occur when radioactive material is swallowed or breathed in.

Internal contamination can also occur when radioactive material enters the body through an open wound.

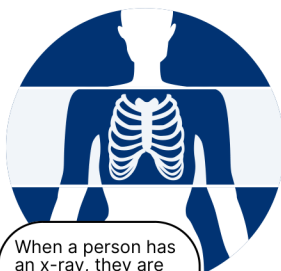
Different radioactive materials can accumulate in different body organs.



## RADIATION EXPOSURE

Another word for radiation exposure is irradiation.

Radioactive materials give off a form of energy that travels in waves or particles.



When a person has an x-ray, they are exposed to radiation but is not contaminated

When a person is exposed to certain types of radiation, the energy may penetrate the body.



A person exposed to radiation is not necessarily contaminated with radioactive material.

For a person to be contaminated, radioactive material must be on or inside their body.

# HOW YOU WILL BE NOTIFIED

There are several ways you will be notified of an incident at a nuclear power plant, and of any protective actions you may need to take, such as sheltering or evacuating. These include:

- If you live within 10 miles of the plant, wireless emergency alerts will send to cell phones and emergency information will broadcast over the local Emergency Alert System if a protective action decision is made.
- If you live between 10 and 50 miles, emergency information will broadcast over television and radio stations in your area.



There would likely be continuous television and radio coverage of a nuclear power plant incident. This coverage will include news conferences held by state, local, federal, and utility officials. These news conferences will contain information about the emergency actions you should take.

You should pay close attention to the information you hear over the emergency alert system, as well as information you hear from state and local officials in broadcast news conferences. This information includes official instructions which have been coordinated by local, state, and federal emergency management, along with agricultural and health agencies.



# PROTECTIVE ACTIONS YOU SHOULD TAKE

Local, state and federal emergency management, along with agricultural and health agencies will determine the protective actions that you should take. These protective actions could include instructions for the proper washing of food items before eating them, sheltering livestock and feeding them protected feed and water, the temporary hold on the sale and transportation of certain food and feed items, or other instructions which may be appropriate.

The state will use the information from samples collected by state and federal personnel to determine the location and amount of radioactive



## ACTIONS TO PROTECT FARM ANIMALS

It is important to shelter animals, their feed, and their water supply. If livestock and dairy animals consume contaminated feed and water, some of the contamination will be absorbed into their bodies and it could enter the human food supply through meat and dairy products.



State and local government officials will inform you about the actions you should take depending upon your distance from the nuclear power plant.

Removing farm animals from a pasture and placing them under shelter is the most effective way to limit their contamination by radioactive material.

- If possible, put your animals in a completely enclosed barn, shed, or other shelter and limit entry of outside air and rainwater into the structure. Give them food from enclosed barns, sheds, granaries, and silos. Feed stored outside, which is directly exposed to air and rain, may be contaminated.
- Feed stored in sheds and cribs with open sides, uncovered haystacks or bails, bunker silos and feed piles that are not covered, and upright silos without roofs may also be contaminated. Give your animals water that has been protected from direct contact with air and rain.
- Some form of sheltering is better than none, but the best protection is in a totally enclosed structure that has a roof and masonry, metal or stone walls. When animals are enclosed remember:
  - Do not overcrowd them.
  - Do not allow them to become over heated.
  - Allow some air ventilation.
  - Provide water and feed from protected sources.

Remove dairy animals from pasture and feed lots first, followed by other types of livestock. Radioactive materials can quickly enter the food chain through milk and other dairy products so it is essential that priority be given to protecting dairy animals. If you live in an area within 10 miles of the plant that has been evacuated, you will be allowed to temporarily reenter the area to milk and feed dairy cows if radiation levels are low enough for safe reentry



Poultry can remain in their existing structures because they are normally raised under some type of shelter and given stored feed and covered water.

If it is necessary for you to evacuate, and time permits, be sure to leave enough water and feed for your livestock (one day's supply or more).

If animals are exposed to radioactive particles or rainwater, they should be washed with uncontaminated water before being brought into a sheltered area. Washing animals requires protective clothing, such as something one would wear when applying pesticides. Do not allow animals to graze unless directed to by your local UW Extension agent or other state officials.

## **DO NOT DESTROY, MARKET OR SLAUGHTER ANY ANIMALS UNLESS DIRECTED TO DO SO BY STATE OR LOCAL GOVERNMENT OFFICIALS.**

Animals should not be sent to market until they are determined to be safe for consumption or until a decision is made to dispose of them. You will be instructed as to how to safely handle, decontaminate, or dispose of any farm animals that have been contaminated. Aquaculture operators should contact your local UW Extension agent or the Wisconsin Department of Agriculture, Trade and Consumer Protection.

Follow these procedures until state or local officials inform you that the level of radiation has decreased to a safe amount.

If you have questions about caring for your animals during an emergency, contact your local UW Extension agent found on page 22.



# ACTIONS TO PROTECT **FARM LAND AND CROPS**

Most farmland that is contaminated by a radiological incident can be used again for agricultural purposes. The length of time that the land should remain fallow depends on the amount and types of radioactive materials that have settled on it. If your land is or may be contaminated, emergency officials will:

Determine the types and levels of the contamination. This may require authorized officials to take samples of air, water, oil, and crop and animal products, such as milk.

Recommend treatment procedures such as idling the land for a specific period of time, liming the soil to prevent absorption of specific radioactive substances by the crops, and alternating crops or deep-plowing the soil to limit surface and plant exposure to contamination.

Recommend alternative uses of land for a period of time.

Standing crops should be allowed to grow to maturity. The amount of radiation exposure that could occur would most likely not be strong enough to damage their growth and safety. Most contamination will either be washed off or will drop to safe levels during the growing process. Your local UW Extension agent or other official will advise you if special harvesting procedures will be needed or if other actions are required.

Contaminated grains that are permitted to grow to maturity will likely only require milling or polishing to remove the contamination. When grain or other feed is stored in an exposed location and not intended to be milled for feed, it can be made safe by carefully removing the contaminated surface layer of grain. Store this contaminated grain or feed separately until your UW Extension agent or other official instructs you on handling.



Unprotected fruits and vegetables in the field may have radioactive particles on the surface. Leaves, pods, and fruits should be washed or peeled before eating. Some leafy vegetables may be eaten after the outer layers are removed and the product is washed. Ripe fruits and vegetables may be lost if high levels of radioactive contamination prohibit entry of persons to harvest them. Those that do not need to be harvested immediately can be salvaged when the area has been determined safe for harvesting.

Pasture and forage plants usually retain very little of the radioactive material deposited on them. The extent to which plants collect and retain radioactive materials depends on the amount and types of the radioactive substances, the nature of the soil and ground cover, the foliage characteristics, and the weather conditions.

# ACTIONS TO PROTECT HONEY

Beehives will have to be monitored by authorities to determine if contamination is present. Actions you may be asked to take include destroying the hive, removing and destroying the affected combs, or storing the honey until the contamination levels are reduced to an acceptable level. If no contamination exists or a safe level is detected, honey may continue to be harvested.



# ACTIONS TO PROTECT FISH



State and local officials will need to monitor fish raised in ponds or fish hatcheries to determine if contamination is present. If no contamination exists or a safe level is detected, fish may continue to be harvested.



# PROTECTIVE ACTIONS FOR **FOOD PROCESSORS AND DISTRIBUTORS**

Food processors and distributors will also have to take actions to protect the food supply. They will have to comply with holds, which may be placed on the sale and transportation of food items that are found to be or believed to be contaminated with radioactive material.

Additional protective measures will include preventing processing plants and facilities from becoming contaminated, the decontamination of those facilities if the need arises, and the prevention of the contamination of food items that are shipped into or out of the area.

Any protective measures that are instituted will have to remain in effect until food samples can be collected and tested in a laboratory to determine if they are safe to eat. In the event of an incident at a nuclear power plant, state and local officials will give you more detailed information about actions you should take.

# PROTECTIVE ACTIONS FOR WATER UTILITIES



Managers of water utilities will have to take actions to protect the water supply. Utilities which obtain their water supply from sources of surface water are of primary concern because surface water is easily contaminated by airborne radioactive material. Water obtained from wells is much less likely to be contaminated.

State personnel will collect water samples at the supply source and at the treatment facility to determine if radioactive contamination is present. You will then be instructed as to the need to shut intakes into water purification facilities. Wisconsin Department of Natural Resources staff will provide additional information.



# POST-EMERGENCY ACTIONS

## **REENTRY**

Reentry and recovery activities will take place after the immediate danger of the emergency has passed and the contaminated areas have been clearly identified. Initially, reentry into a restricted, contaminated area will be temporary and will be allowed only under controlled conditions. In all probability, this area will be within the 10-mile radius of the commercial nuclear power station.

If you have been evacuated from your area, you may be allowed to return temporarily to your farm when conditions permit. State or local government officials will advise you through the commercial media or other official means if a decision to permit reentry is made. You will receive specific instructions on routes to use and safety precautions to take. Reentry will allow you to perform such vital activities as milking, watering, and feeding livestock.

## RECOVERY

Recovery is the process of reducing radioactivity in the environment to acceptable levels for normal daily living. Following the emergency, state officials will identify the types and levels of contamination. They may take samples of air, water, soil, crops and animal products from your farm or business.

They will provide you with instructions and assist you in decontaminating your animals, food and property if such actions are necessary. Contaminated food will be isolated to prevent its introduction into the market place. State officials will determine whether condemnation and disposal are necessary.



## COMPENSATION FOR LOSSES

Compensation for the losses you suffer as a result of a nuclear power plant incident may be available. Make sure that you carefully document all losses that you incur. The utilities, which operate nuclear power plants in this country, contribute to an insurance fund administered by American Nuclear Insurers.

These funds may be used to compensate members of the public for losses they may suffer.

# INGESTION COUNTIES UW EXTENSION AGENTS

<b>County Name</b>	<b>Phone</b>
<b>Barron County</b>	<b>715-537-6250</b>
<b>Brown County</b>	<b>920-391-4610</b>
<b>Buffalo County</b>	<b>608-685-6256</b>
<b>Calumet County</b>	<b>920-849-1450</b>
<b>Door County</b>	<b>920-746-2260</b>
<b>Dunn County</b>	<b>715-232-1636</b>
<b>Eau Claire County</b>	<b>715-839-4712</b>
<b>Fond du Lac County</b>	<b>920-929-3170</b>
<b>Green County</b>	<b>608-328-9440</b>
<b>Kewaunee County</b>	<b>920-388-7141</b>
<b>Lafayette County</b>	<b>608-776-4820</b>
<b>Manitowoc County</b>	<b>920-683-4167</b>
<b>Marinette County</b>	<b>715-732-7510</b>



<b>County Name</b>	<b>Phone</b>
<b>Oconto County</b>	<b>920-834-6845</b>
<b>Outagamie County</b>	<b>920-832-5121</b>
<b>Pepin County</b>	<b>715-672-5214</b>
<b>Pierce County</b>	<b>715-273-6781</b>
<b>Polk County</b>	<b>715-485-8600</b>
<b>Rock County</b>	<b>608-757-5066</b>
<b>St. Croix County</b>	<b>715-531-1930</b>
<b>Shawano County</b>	<b>715-526-6136</b>
<b>Sheboygan County</b>	<b>920-459-5904</b>
<b>Walworth County</b>	<b>262-741-4951</b>
<b>Winnebago County</b>	<b>920-232-1970</b>

Additional information can be obtained from your county Emergency Management Office or the local UW Extension Service Office, as well as from the 211 Wisconsin.

**211 Wisconsin can be reached by dialing  
2-1-1 or 1-877-947-2211**

# **EMERGENCY PLAN**

## **FARM INFORMATION**

**Name of Farm:**

**Farm Contact Person:**

**Farm (Physical) Address:**

**Town:**

**Zip Code:**

**Global Position System (GPS),  
location (longitude and latitude):**

**Phone Numbers: (Home):  
(Cell) :**

**Fax or Email:**

## **LOCAL EMERGENCY SERVICES NON-EMERGENCY NUMBERS**

**Police:**

**Sheriff:**

**Fire:**

**Emergency Medical Team:**

# EMERGENCY **PLAN** (CONTINUED)

## **ANIMAL NEEDS**

**Veterinarian Name:**

**Phone Numbers: (Office)**

**(Cell)**

**Animal Medications:**

**Animal Medical Records:**

## **AVAILABLE PROTECTED ANIMAL FEED**

**Available Protected Animal Feed:**

**Grain Stored in Bins:**

**Hay Stored in Barn/Covered Shed:**

**Hay Bales Covered by Tarp/Plastic:**

**Ensilage Stored in Covered Silo:**

**Ensilage in Covered Trench/Bunker:**

# EMERGENCY **PLAN** (CONTINUED)

## AVAILABLE PROTECTED WATER:

**Enclosed Container:**

**Freely Running Spring (covered):**

**Rain Barrels (covered):**

**Deep Wells (covered):**

**Generator to Pump Water:**

**Troughs:**

**Other Source:**

# EMERGENCY PLAN (CONTINUED)

## LIVESTOCK

**First Priority Animals: Shelter/Location:**

**Amount of Protected Feed Required for 7 days:**

**Amount of Protected Water Required for 7 days:**

**Power/Generator: HV/AC:**

# EMERGENCY PLAN (CONTINUED)

## **POULTRY ANIMALS:**

**Shelter/Location:**

**Amount of Protected  
Feed Required for 7 days:**

**Amount of Protected  
Water Required for 7  
days:**

**Power/Generator:**

**HV/AC:**

## **OTHER ANIMALS:**

**Shelter/Location:**

**Amount of Protected Feed for 7 days:**

**Amount of Protected Water for 7 day**





This brochure was prepared by:



WISCONSIN EMERGENCY MANAGEMENT -  
RECOVERY SECTION  
2400 Wright Street  
Madison, WI 53718



<https://wem.wi.gov/radiological-emergency-preparedness/>