
State of Missouri Emergency Management Agency

Emergency Information for Missouri Farmers, Food Processors and Distributors in case of a Radiological Accident at a Nuclear Power Plant



To be Issued by the Missouri State Emergency Management Agency
Approved by Department of Health & Senior Services//MDA/USDA



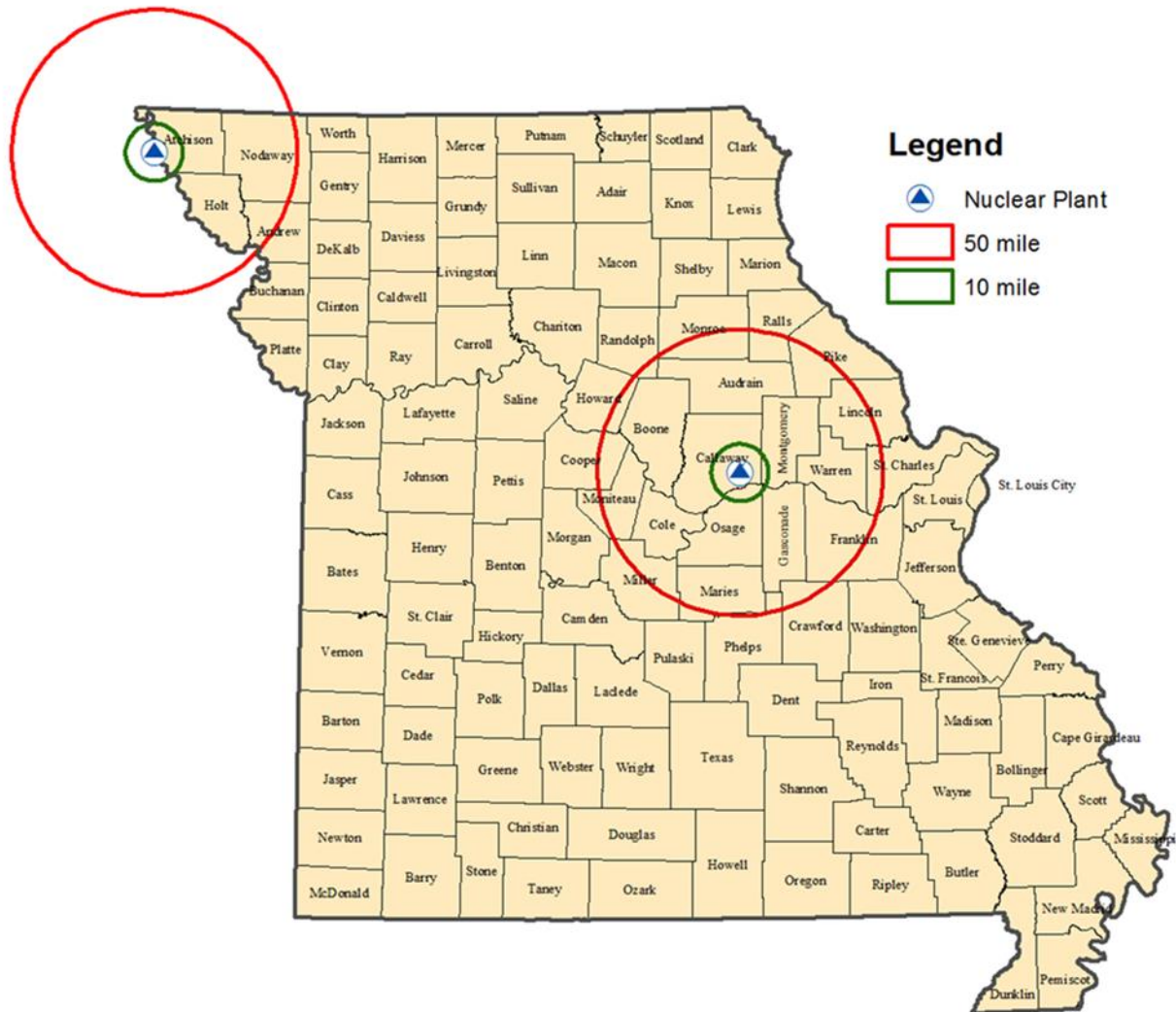
Preface

This booklet contains information for farmers, food processors, and distributors on the probable and potential effects of radiation on their operations. It is intended to help the agricultural community better understand the effects of radioactive contamination on plants, soil, water, and animals, and the basic needs and care of animals should a radiological accident occur.

This information applies to agricultural communities near nuclear power plants (both the Callaway Energy Center and Cooper Nuclear Station), and those which may be affected by a transportation accident involving radioactive materials on one of our major highways. Information is shared on what you may be asked to do if an incident occurs causing an area to be exposed to radiological contamination.

If an emergency results in a release of radioactive material to the environment, your first priority will be the safety of you and your family. You will receive information along with specific instructions through the Emergency Alert System (EAS), over the local emergency broadcast radio stations, or through other official news releases. The information will include an explanation of actions that you will need to take to protect you and your family, your farm animals and products within the affected area.

Map of Nuclear Power Plants that could impact the State of Missouri



EMERGENCY PLANNING ZONES

Two types of emergency planning zones (EPZs) may be referred to during a nuclear power plant emergency:

The Plume Exposure Pathway EPZ is the area within an approximate **10-mile radius** around the nuclear power plant in which people and animals may be directly exposed to radiation.

The Ingestion Exposure Pathway EPZ is the area within an approximate **50-mile radius** around the nuclear power plant in which people and animals may be indirectly exposed to radiation by eating or drinking contaminated food, milk and water.

SOURCES OF EMERGENCY INFORMATION

In the event of an emergency at Callaway Energy Center or Cooper Nuclear Station, specific protective action recommendations will be issued by appropriate state or local government officials. Information to prevent or minimize radiation contamination of food products will be provided to you through at least one of the sources listed below:

- Emergency Broadcast System (EBS)
- Local Cooperative Extension Service Office
- Local Radio and Television broadcasts
- Social Media
- Telephone

The Primary Emergency Alert System (EAS) Radio Station near the Callaway Energy Center is: KTXY 106.9 FM and KWOS 95.7 FM.

The Emergency Alert System (EAS) is also the primary messaging system used for Cooper Nuclear Station, but instead is broadcasted via National Weather Service designed to broadcast messages to specific areas around the plant.

National Oceanic and Atmospheric Administration (NOAA) Weather Radio will also broadcast message tones via notifications that will provide up-to-date weather and all-hazards information. The broadcasts may also provide emergency instructions on protective measures or actions that the public might be asked to perform.



PROTECTIVE ACTIONS AND TECHNICAL GUIDANCE

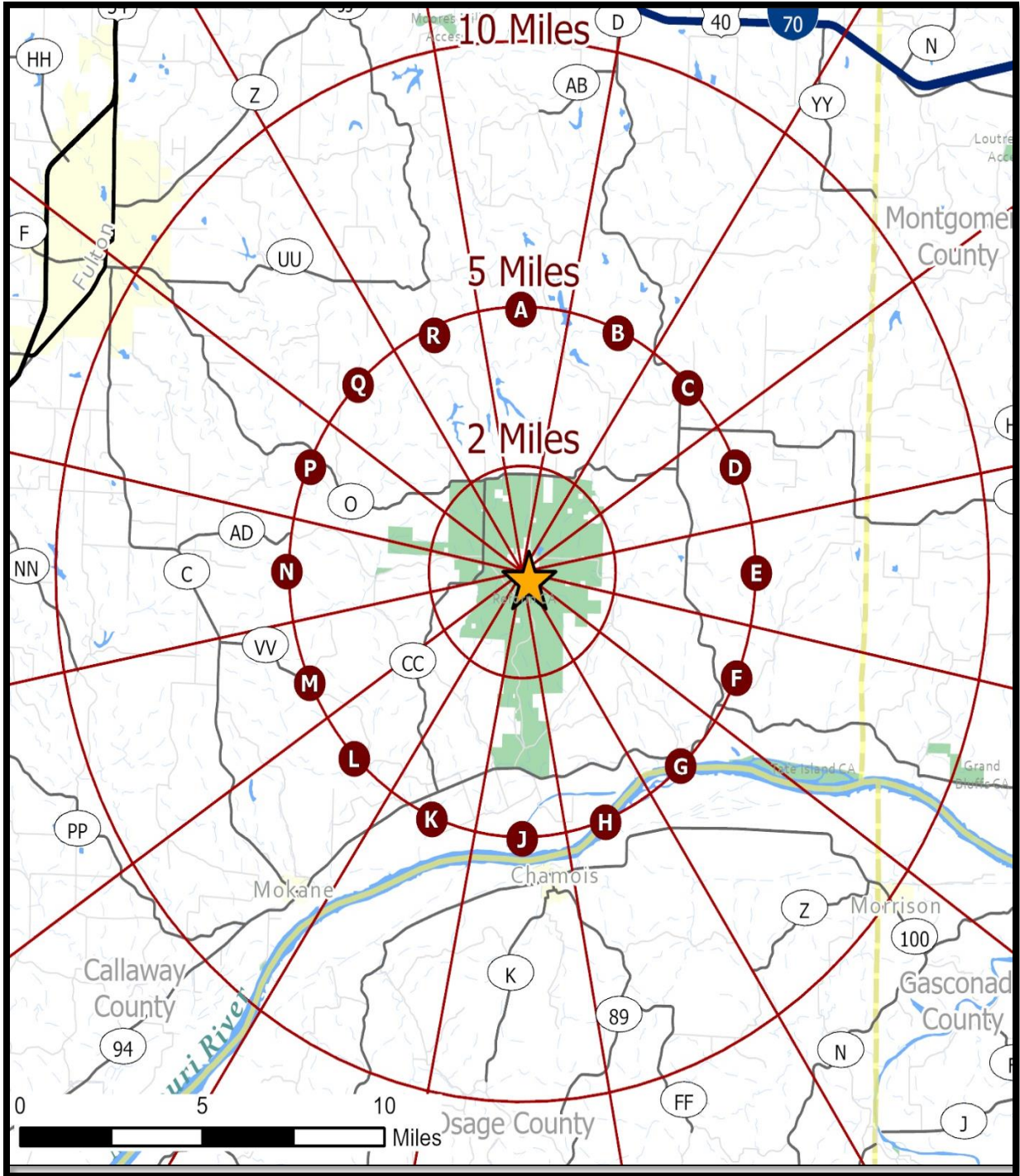
Emergency protective actions are intended to prevent or minimize the possibility of consuming radioactive contaminated products and getting contaminated food into the food chain.

Specific instructions will depend on the distance of your farm or facility from the commercial nuclear power plants and the existing weather conditions. For those who cannot follow the protective action recommendations stating to shelter, feed and water farm animals, please consult your local health department for more details and guidance.

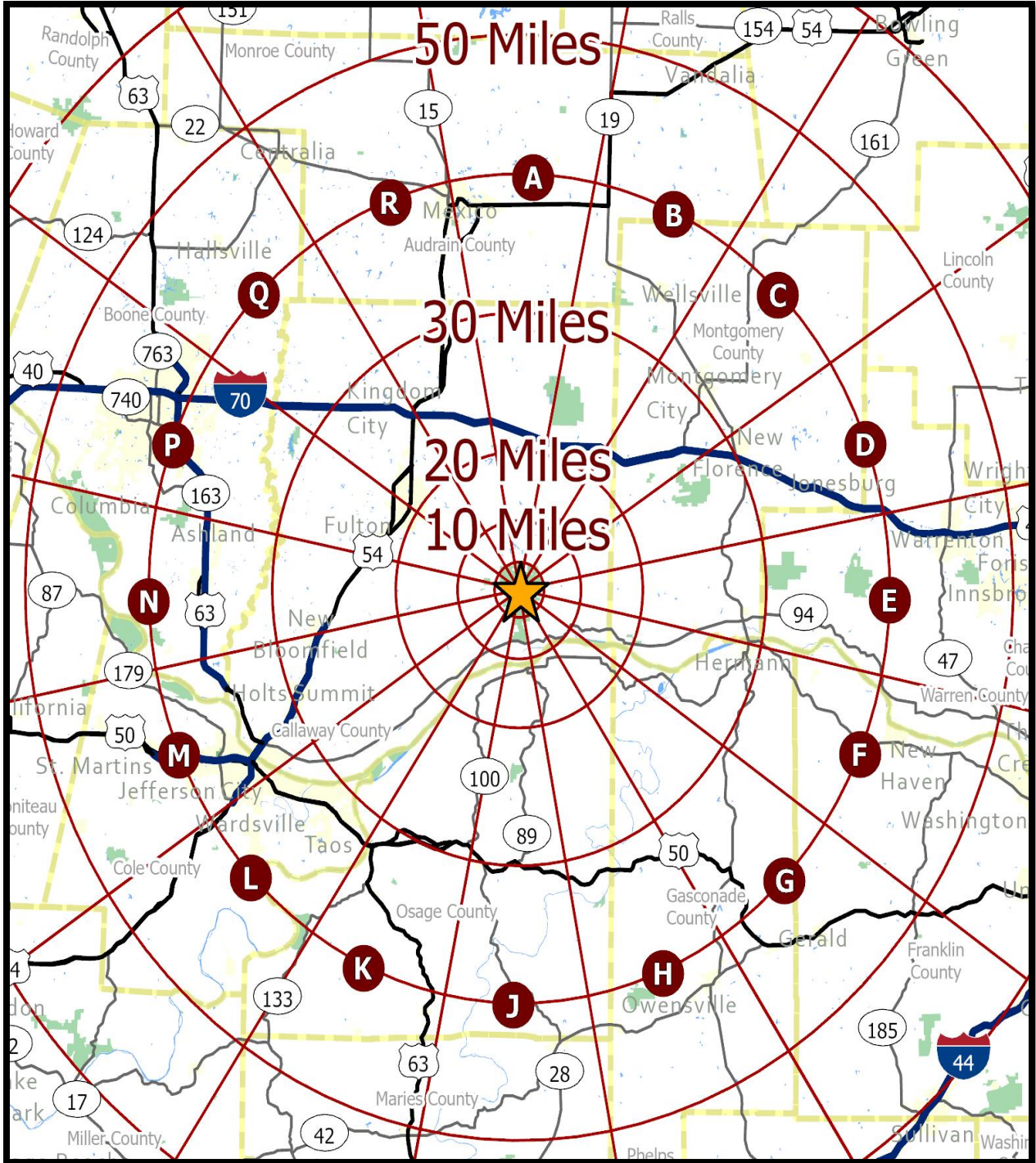
The following are examples of protective actions that could be recommended to farmers if a release of radioactive materials occurred, or if there was potential of a radioactive release. During this time, monitoring for contamination of agricultural products is ongoing and verified by appropriate state or local government officials.

- Wear clothing that covers all portions of the body when going outside; for example, boots, gloves, coveralls or long pants, and long sleeved shirts.
- Wear a respirator, protective mask, or place a folded (preferably dampened) cloth over your mouth and nose when working outside.
- Remove outer clothing before going indoors and discard them or wash them immediately.
- Wash hands thoroughly before preparing or eating food.
- Remove dairy animals from pasture, shelter them if possible, and provide them with protected feed and water.
- Delay the slaughter of any animals.
- Follow the advice of health officials.
- Do not consume fresh milk from your dairy animals, fresh vegetables from your garden, or eggs from your chickens.
- Do not engage in dust-producing activities; such as, cultivating, disking, baling, or harvesting.
- Do not process or distribute agricultural products until they have been sampled by appropriate government officials and found to be free of contamination.
- Do not transport or market food products.
- Restrict fishing to catch and release

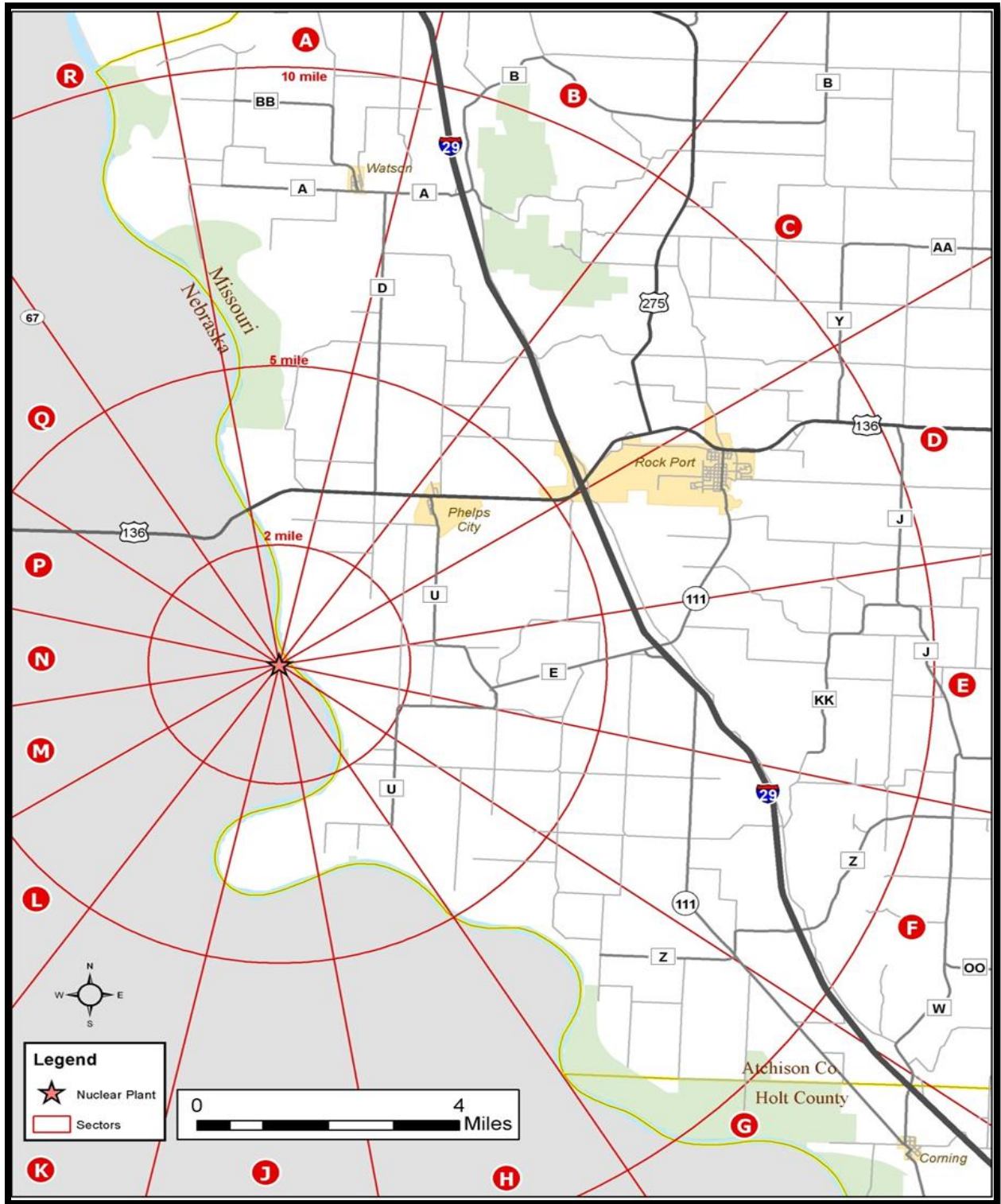
Callaway Energy Center 10-Mile Emergency Planning Zone



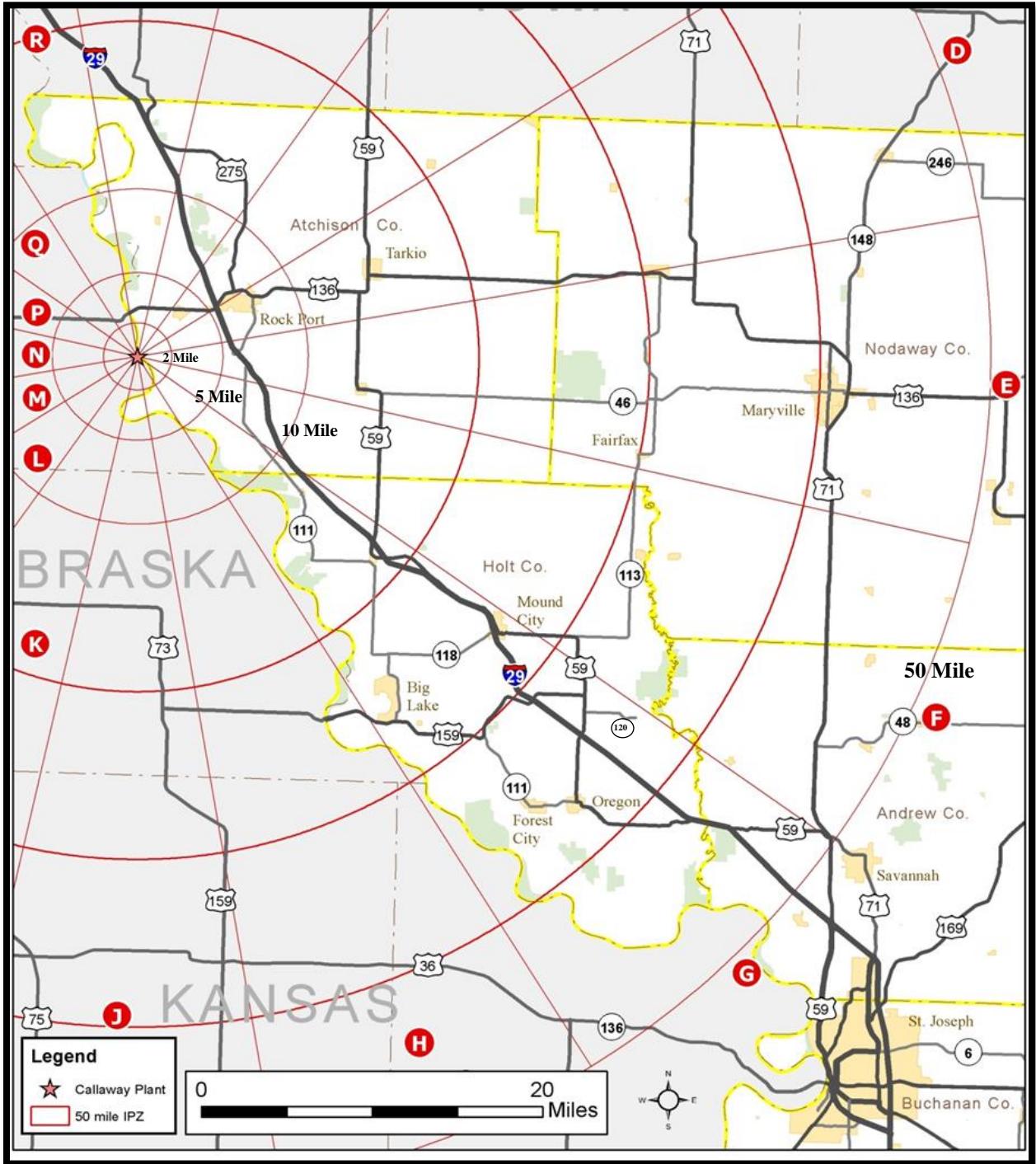
Callaway Energy Center 50-Mile Planning Zone



Cooper Nuclear Station 10-Mile Planning Zone



Cooper Nuclear Station 50-Mile Planning Zone



PROTECTIVE ACTIONS FOR FARM ANIMALS AND PRODUCTS

The safety of the food supply could be a concern to members of the agricultural community if a radiological release occurred. During such a release, both water and land could become contaminated. Animals and humans are at risk of eating contaminated foods and drinking contaminated milk and water, which could have harmful, long-term health effects. The best way to prevent contamination of animals, food and water supplies is to cover them. This can be done by removing animals from pastures and housing them in a shelter structure and by covering the feed and water with tarps or similar coverings.

Actions to isolate or contain food and prevent its introduction into commerce include restricting or withholding (embargo) the shipment of agricultural and dairy products from the affected areas to processors or the marketplace.

In the event food is contaminated-normal food production and processing actions would reduce any contamination that is present. Examples would include washing, peeling or shelling products to eliminate surface contamination, and freezing, drying or storing processed products to allow for decay of radioactivity.

The following are more specific examples of protective actions and related information that may be recommended to the agricultural community by appropriate state or local government officials. Location-specific recommendations will be issued by these officials in the event of an actual emergency.

Sheltering Guidance

Some farm buildings provide better protection than others. Shelter walls should be solid to increase shielding effectiveness. It is important to minimize ventilation in shelter structures during a radiological event. Avoid running fans or put on low speed to reduce the draw of outside air. Natural shelters such as caves, ravines, and forests can offer some protection. It is important to remember, any shelter is better than none and animals need adequate space and ventilation.

Protection of Dairy Animals and Meat Producing Animals

For both dairy and meat animals, breeding stock and valuable animals should receive priority care. Dairy animals should be moved indoors first because radioactive materials are easily transferred to milk. State or local government officials, including the Emergency Management Director for your county and the Missouri Department of Health & Senior Services may come to your farm to take milk, feed and water samples for laboratory analysis to determine whether any of these products are contaminated. If your dairy products are sampled, you will be informed whether they contain radioactive materials and instructed on what can be done with the products.

It is possible for milk products contaminated with certain radioactive materials to be safe for human consumption after proper storage over a period of time. Storage of milk for prolonged periods of time at reduced temperature is possible provided ultra-high temperature pasteurization techniques are used during processing. Using fluid milk for the production of butter, cheese, dry milk or evaporated milk may also be possible.

Protection of Animal Feed

Since radioactive particles are like dust settling from the air, the use of feed should be limited to those under cover or protected. Storage areas can include a barn, shed, grain bin, covered silo, or other shelter structure. Hay in an open field should not be used unless covered prior to a radiological event or after the outer layers have been removed and discarded. If possible, do not allow animals to graze until further guidance is given.

Protection of Water Supply

The best sources of water are a covered well, tank, or running spring. Water from open cisterns and livestock watering troughs; as well as, surface sources such as rivers, lakes, streams and ponds would be considered contaminated. Obtain drinking water for livestock from another source, if possible.

Protection of Swine

Swine raised in buildings are already provided protection from contamination. Move swine raised outdoors to a shelter if possible. Adequate space is important and ventilation systems should run at the lowest possible level. Provide swine with protected feed and water.

Protection of Poultry and Poultry Products

Poultry raised outdoors, especially those kept for egg production, should be monitored by taking samples (animal hair, feathers, droppings, or the area outside the chicken coop) and performing laboratory tests to determine the presence of radioactive contamination. Poultry raised indoors and given protected feed and water are not likely to be contaminated. If contamination is verified, state or local government officials may advise that poultry and eggs should not be eaten.

Protection of Fish and Marine Life

Fish and other marine life raised in ponds may continue to be harvested unless appropriate state or local government officials have determined through laboratory analysis of samples that they are contaminated. Samples of water, fish and marine life from surrounding areas will also be analyzed to ensure that they are safe for human and wildlife use.

Protection of Fruits and Vegetables

Wash, scrub, peel or shell locally grown fruits and vegetables, including roots and tubers, to remove surface contamination. If they are contaminated by short-lived radionuclides (e.g., Iodine-131), preserve by canning, freezing or dehydration and store to allow time for decay of the radioactivity.

Protection of Soil

If state or local government officials find that the soil is contaminated, proper soil management procedures can be implemented to allow return to normal agricultural use within several weeks to safe levels. Idling (the nonuse of the land for a specific period of time) may be necessary in some cases.

Planting alternative crops may also be recommended in some situations. Crops such as cotton and flax could be substituted for food crops because they contribute little or no radioactive material to the human diet. Deep-plowing the soil will move radioactive substances below the plant root level, prevent plants from taking up contaminated nutrients and allow the level of radioactivity to decrease with the passage of time. State or local government officials will let you know what actions are appropriate.

Protection of Grains

If grains are permitted to grow to maturity, it is plausible that most contamination will be removed by the wind and rain. Screening or cleaning should remove any remaining contamination. Sampling and laboratory analysis will determine if the grain is safe to use. When harvested, contaminated and uncontaminated grains should be stored separately.

Protection of Honey

Honey and beehives will need to be sampled and analyzed by appropriate state or local government officials if radioactive contamination is detected in the area. You will be instructed by these officials on how to handle the hives and honey.

FOOD PROCESSING AND MARKETING

Following a radiological emergency, government officials may restrict the movement of food products and withhold them from the marketplace if they are found to be contaminated. These products should not be released until they are considered to be safe for consumption or until a decision is made to dispose of them. You will be instructed how to safely handle and dispose of contaminated food products.

POST-EMERGENCY ACTIONS

The following sections describe post-emergency actions that will occur if contamination is verified.

Re-entry is the temporary entry, under controlled conditions, into a restricted, contaminated area, in all probability within the 10-mile radius of the nuclear power plant. 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 local news media if a decision to permit re-entry is made. You will receive specific instructions on routes to use and safety precautions to take. Re-entry will allow you to perform such vital activities as milking, watering, and feeding farm animals.

Recovery is the process of reducing radiation in the environment to acceptable levels for normal daily living. The emergency, state, and local government officials may need to take samples of air, water, soil, crops, and animal products from your farm or business. When the testing is complete, they will identify the types and level of contamination, and notify you with instructions and assist you for decontaminating your animals, food, and property.

SUMMARY

If a radiological emergency occurs in your immediate area, you will be alerted by the sounding of a siren, an emergency vehicle equipped with a loudspeaker, or other appropriate means. You should take the following actions:

- Turn on your radio or television and tune to a station or channel that carries Emergency Alert System (EAS) information.
- Follow the recommendations of the state or local emergency response officials as provided by the above sources. You may be advised to take protective actions such as:
 - **Protect Feed and Water:** Cover outside feed and open water source supplies with a tarpaulin or other appropriate material.
 - Remove dairy animals from pasture, and protect other livestock and poultry by sheltering them if possible, and providing them with protected feed and water.
 - If you live within the Plume Exposure Pathway EPZ of the nuclear power plant, you may be advised to take shelter or to evacuate. This would help protect you and your family from potentially harmful levels of radiation.

ADDITIONAL INFORMATION

If you would like additional information or have questions concerning radiation exposure precautions related to nuclear power plants, please contact the following agencies:

State Emergency Management Agency
Radiological Emergency Preparedness Program
(573) 526-9245

Department of Health & Senior Services
Radiological Emergency Response Program
(573) 751-6112

