Radiological Emergency Information

for **Farmers, Food Processors** *and* **Distributors**

Washington State Department of Agriculture

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Introduction

A radiological emergency at the Columbia Generating Station (CGS) commercial power plant or the U.S. Department of Energy facilities on the Hanford Site near Richland could impact Washington State residents in surrounding counties. While it is unlikely that an emergency will occur, it is important to be prepared.

During any emergency, your first concern should be the safety of you, your family, and your employees. Should radioactive materials be released to the environment, local, state, and federal officials will advise you of steps you can take to provide additional protection for your family, employees, animals, and farm or garden products.

We recommend that anyone who grows, produces, processes, or transports food and agricultural products study this booklet and keep it with your emergency preparedness kit in case of the unlikely event of release of radiological material in your area.

Why protective measures may be needed

A release of radioactive materials into the environment can pose a threat to the safety of the food supply as well as our agricultural community. The deposition of radioactive materials could contaminate crops, livestock, uncovered water supplies, and land. When the level of contamination exceeds safe levels, the food is considered to be "adulterated." Eating adulterated foods and drinking adulterated milk or water could have harmful, long-term health effects.

Emergency response

Local, state, and federal emergency response agencies are prepared to notify the community quickly in the event of a radiological emergency. Officials will recommend actions to protect food from contamination and prevent the consumption of adulterated food, milk, and water. Recommended actions are based on a wide range of available information, including the specific type of radiological emergency, weather conditions, and other factors.

Reliable sources of information during an emergency

Your best source of information during an emergency depends on where you live or work. For example, people near the nuclear facility experiencing an emergency will receive initial information over the Emergency Alert System (EAS). People in adjacent areas will receive information from the news media, official government social media sources, or other means. Major food processors and distributors will receive information directly from the Washington State Department of Agriculture.

CodeRED

CodeRED is an opt-in emergency alert system that can send text messages, phone calls, and emails in the event of an emergency. Visit the links below to sign up for these notifications.

- **Benton County**: public.coderedweb.com/CNE/en-US/BF5CA95E04FE
- **Franklin County**: public.coderedweb.com/CNE/en-US/BF5D7C512203

Energy Northwest website

In the event of an emergency at the Columbia Generating Station, Energy Northwest will provide updates on their website. www.energy-northwest.com

Social media

Information about an emergency is frequently posted through social media. Be sure to follow and share information only from official sources: county emergency management officials, Energy Northwest, the Washington State Department of Agriculture, the Washington State Emergency Management Division, the Washington State Department of Health, and the governor.

Please DO NOT share information from unofficial sources as this often contributes to the spread of misinformation that may be incorrect and could put someone's life in danger.

Emergency Alert System (EAS)

Local emergency response officials will provide instructions and emergency-related information over designated radio and television stations.

A list of EAS stations is provided for each of the counties within 50 miles of the Columbia Generating Station and the Hanford Site. Listeners should keep in mind that KONA AM and FM are the primary EAS stations in this area.

Adams County

- KONA 105.3 FM
- KONA 610 AM
- KXLY 920 AM
- KXLY 99.9 FM

Benton and Franklin Counties

- KONA 105.3 FM
- KONA 610 AM
- KORD 102.7 FM
- KZHR 92.5 FM
- KALE 960 AM

Grant County

- KONA 105.3 FM
- KONA 610 AM
- KALE 960 AM

Kittitas County

- KXLE 1240 AM
- KXLE 95.3 FM
- KQBE 103.1 FM

Klickitat County

- KIHR 1340 AM
- KCBG 105.5 FM
- KYYT 102.3 FM
- KLCK 1400AM

Walla Walla County

- KONA 105.3 FM
- KONA 610 AM

Yakima County

- KIT 1280 AM
- KFFM 107.3 FM

News media

Local and state emergency response officials will provide information to the news media. These reports will appear on radio and television as well as in newspapers and other online news media outlets.

Personal contact

The Washington State Department of Agriculture will provide information directly to food producers.

Toll-free phone

The state of Washington may provide information through toll-free phone numbers established at the time of an emergency.

Limiting your exposure

Radioactive particles emit energy that can disrupt normal cell functions. Risk can be minimized by taking protective actions to reduce the amount of exposure to radioactive material.

Exposure pathways

There are three ways that you can be exposed to potentially harmful levels of radiation during an emergency:

Direct exposure to radioactive material is most significant during the emergency phase of the event when the radioactive material is being released. Access will be restricted in areas where exposure to radioactive materials exceeds pre-determined levels. These levels are well below those that can cause any observable health effects.

Ingestion of radioactive material by consuming adulterated food or beverages is another way you can be exposed. If food or water containing radioactive material is consumed, it poses an increased risk to the body's organs. High or prolonged exposure to radiation can damage organs, eventually resulting in dysfunction or even cancer.

Inhalation of radioactive particles is another hazard. Inhalation allows radiation-emitting particles to come in direct contact with the lining of the lungs. The lining of the lungs is sensitive to and easily damaged by the energy that radioactive particles emit. Inhaled radioactive particles can be expelled by normal biological processes. Some particles that are more difficult to expel can stay in the lungs longer, resulting in a greater risk of damage. Care should be taken to minimize inhaling radioactive particles.

Protective actions

Protective actions prevent or minimize the possibility of consuming adulterated food or minimize contamination of the food itself. For example, as a protective action you can wash, scrub, peel, or shell fruits and vegetables to remove surface contamination. For another example, the state may take protective action and restrict or withhold agricultural commodity and dairy products from the marketplace by prohibiting their transportation out of affected areas.

Food Control Areas

At the outset of a radiation-related emergency, state radiation health experts will determine which areas may be contaminated by radiation. They do this by using information from field measurements and computer projections. The area which includes potentially adulterated food is designated as a **Food Control Area**.

The purpose of the Food Control Area is to:

- prevent consumption of potentially adulterated food and beverages from the area; and
- prevent potentially adulterated food products from being moved to the marketplace.

To prevent the consumption of adulterated food, commercial food transport from the Food Control Area will be stopped. Cargo attempting to leave the Food Control Area will be required to return to its point of origin.

Early field monitoring and laboratory testing will focus on two segments of the agricultural community within the Food Control Area:

- **Commercial dairies and milk processing plants** will be checked first because contamination can appear in fresh whole milk within 72 hours of a release of radioactive materials. Early monitoring and testing will help protect people living or working within the potentially affected area. Children are the primary consumers of milk products and are also most sensitive to radiation.
- **Fresh foods at farms and food processors** will not be permitted to move out of the Food Control Area until testing is completed. The timing and order of testing will be determined by the harvest times for crops.

Fresh food and dairy products will be embargoed and destroyed if lab testing shows they are adulterated. Food and dairy products shown by lab testing to be safe for consumption will be allowed to go to market.

Checkpoints, called Food Control Points, will be set up at the boundary of the Food Control Area to ensure that potentially adulterated food and agricultural products do not leave the Food Control Area.

Home gardeners and small-scale farms

Checking for contamination at home gardens and small-scale farms may not begin for weeks after an emergency. Homegrown produce should be tested for radioactive contamination before it is consumed. Home gardeners and small-scale farmers should wait for a field monitoring team to help them. The Washington State Department of Agriculture and the Washington State Department of Health will also provide further instructions.

Lifting food controls

The boundary of the Food Control Area will be revised as data becomes available on the extent of radioactive contamination. The Washington State Department of Agriculture will provide information when normal production and transportation activities can resume in areas where food controls have been lifted.

Relocation Area

Field monitoring teams may find an area too contaminated for people to live in or for normal farming activities to continue. Such an area is called a **Relocation Area**. Access will be limited to emergency workers, monitoring teams, and others who must enter under controlled conditions.

Those living in a designated Relocation Area will be asked to leave the area. The length of time they will be away from their homes and farms will depend on the level of contamination. Farmers may be allowed to return to care for animals and to perform other necessary functions in these areas under controlled conditions designed to minimize radiation exposure.

Emergency Worker/Assistance Centers

Information for farmers who must care for animals and other necessities in a Relocation Area will be provided at Emergency Worker/ Assistance Centers opened during the emergency. Locations of the centers will be announced as they become available.

Protecting farm workers

People who continue to work their farms or gardens may be advised how they can further reduce the possibility of radioactive contamination. To minimize the inhalation or ingestion of radioactive materials deposited on vegetation or in the soil and to avoid bringing contamination into living spaces, individuals might be asked to take the following steps:

- Wash hands thoroughly before eating.
- Wear clothing such as coveralls, gloves and hats while working outside. The clothing should cover all portions of the body. Remove outer clothing before going inside.
- As much as possible, avoid activities that can stir up contamination, such as plowing, digging, burning, or mowing. Wear a dust mask or a folded, dampened cloth over nose and mouth to reduce the quantity of radioactive materials inhaled when such activities cannot be avoided.

- Do not eat, drink, or use tobacco products while working outside in a potentially contaminated area.
- Shower after completing outside activities.
- Wash outer clothing.

Protecting farms

Farmers and ranchers may be asked to shelter animals and give them protected feed and water. This will help prevent contamination from harming animals and from later entering the human food supply.

Sheltering animals

If advised to shelter animals, remove them from pasture and house them in a farm building. Shelter space may not be available for all animals, so priority should be given to the most valuable livestock. State and local emergency response agencies will provide information on decontaminating farm animals.

Protecting animal feed

Farmers and ranchers may be advised to restrict animals to protected feed and water that have not been stored in the open or exposed to radioactive contamination. Types of protected feed include:

- grain stored in covered bins
- hay stored in a barn or covered shed
- silage stored in a covered silo
- hay bales covered by a tarp or barrier plastic or bales with the outer layers discarded

Protecting water for animals

Even if protected feed during a radiological emergency is unavailable, animals can live for several days on water alone. Water from enclosed wells or other covered or underground sources will normally be safe for livestock.

Open water troughs should be drained, rinsed and refilled after notification that radioactive materials have settled to the ground. The same procedure should be followed after windy weather spreads dust in the area.

Open sources of water, such as rain barrels and tanks should be covered to prevent contamination. Local and state health experts will check open sources of water and indicate if they are safe.

Filler pipes should be disconnected from storage containers supplied by runoff from roofs or other surface drain fields. This will help prevent contamination from entering the storage containers.

Intake valves on water systems should be closed when you suspect the water source may be contaminated. This will prevent distribution or irrigation until the water source is tested and found to be safe.

Managing contaminated soil

If state officials find that the soil is contaminated above established safety levels, proper soil management procedures can reduce contamination to safe levels. Idling — the non-use of land for a specific period of time — may be necessary. In situations involving highly contaminated soil, removal and disposal of the soil may be more appropriate.

Growing alternative non-food crops may also be recommended in some situations.

Deep plowing the soil can 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.

Protecting crops and farm products

The following specific actions may be advised to reduce the danger of ingesting adulterated food products.

Milk

Remove all dairy animals from pasture, shelter them if possible, and provide them with protected food and water. Sampling teams from the Washington State Departments of Health and Agriculture or the Federal Radiological Monitoring and Assessment Center (FRMAC) will collect milk, feed, and water samples for laboratory analysis to determine whether any products are adulterated with radioactive materials.

If dairy products are found to be adulterated, it will be recommended that milk and milk products be withheld from the market. It is possible, however, for milk products contaminated with very low levels of radioactive materials to be safe for human consumption.

State officials will advise as to which protective actions are appropriate.

Vegetables and fruits

Wash, scrub, peel, or shell locally grown fruits and vegetables, including roots, tubers and grapes to remove surface contamination.

Meat and meat products

If there is a release of radioactive materials into the environment, producers may be advised to place meat animals on protected feed and water and, if possible, provide them with shelter. If livestock consume feed and water contaminated with radioactive materials, some of the contamination may be absorbed into their bodies and could then enter the human food supply.

Poultry and poultry products

Poultry raised outdoors, especially those kept for egg production, should be monitored by taking samples and performing lab tests to determine the presence of radioactive adulteration.

Poultry raised indoors and given protected food and water are not likely to be adulterated. If adulteration is verified, Washington State Departments of Health and Agriculture will advise that poultry and eggs not be eaten.

Grains

If grains are permitted to grow to maturity, most contamination will probably be removed by the wind and rain. Milling or polishing should remove any remaining contamination. Sampling and laboratory analysis will determine if the grain is safe to use. When harvested, adulterated and unadulterated grains should be stored separately.

Separate equipment should be used to harvest adulterated and unadulterated grain or equipment should be appropriately cleaned to limit cross-contamination of radioactive materials.

Bees

Honey and beehives will need to be sampled and analyzed by the Washington State Departments of Health and Agriculture or the FRMAC if radioactive contamination is detected in the area. Washington State Department of Agriculture officials will instruct on how to handle the hives and honey.

Fish

Fish may continue to be harvested unless Washington State Department of Health officials determine through laboratory analysis of samples that they are adulterated. Dilution of the radioactive material in large bodies of water should make adulteration of fish highly unlikely. Samples of water and fish from open bodies of water will be analyzed to ensure they are safe.

Hay, field corn, and other animal feed crops

Hay and other ground crops that were harvested prior to the emergency can be protected indoors or with tarps covering bales in the field. For crops exposed to the weather, much of the surface contamination will probably be removed by the wind and rain. Sampling and laboratory analysis will determine if the commodity is safe to use. When harvested, adulterated and unadulterated commodities should be stored separately. Separate equipment should be used to harvest adulterated and unadulterated crops or equipment should be appropriately cleaned to limit cross-contamination of radioactive materials.

Protecting food products

Food and milk processors, warehouses, and commodity terminals

Windows and vents to the outdoors should be closed. Vacuum systems should be shut down as should compressed air systems. Any system that draws air from outdoors to the inside should be turned off. The processing facility will be notified directly by the Washington State Department of Agriculture if the food products in the facility are affected. WSDA will collect samples and will notify the processor which products can be released for sale.

Protection of Packaged Food Products

Food in finished packaging should not be harmful to eat as long as the outer wrappings are discarded. Radioactivity will travel as fine particles that may coat the outside of the food product container.

Reimbursement for damages and expenses

A radiological emergency may lead to additional living expenses, loss of farm or business income, or physical or property damages.

Claims for damages or expenses

Utilities operating nuclear power facilities are required to have insurance to cover damages sustained by the public. Claims centers will be opened by American Nuclear Insurers within 48 hours of an emergency at the Columbia Generating Station power plant. The claims centers may provide reimbursement for radiological emergency caused expenses to persons affected by an ordered evacuation. Staff at the claims centers will handle claims for living expenses, personal injury, property damage, and loss of income.

Claims for damage or loss resulting from an emergency occurring at a facility operated by the U.S. Department of Energy (USDOE) or its contractors could be filed at a claims center. In the event of an emergency, USDOE would promptly provide information to the public about how to file a claim.

Temporary Housing

The Federal Emergency Management Agency (FEMA) may provide funds for temporary housing as well as other types of assistance. Announcements will be made regarding the location of claims centers, types of assistance programs available, and procedures for obtaining assistance.

General information about radiation

Radiation is a natural part of our environment. The sun provides one of the most familiar forms of radiation. Its rays deliver light (visible radiation) and heat (infrared radiation). We limit its effects on us with sunglasses and hats as well as staying indoors (shielding) and limiting how long we are in the sun (time). With other forms of radiation we may encounter, such as X-rays, distance from the source can also limit exposure. These strategies – time, distance, and shielding – are standard ways we protect ourselves from too much radiation.

People are regularly exposed to radiation through naturally radioactive material in the soil and radon gas (the largest source), cosmic radiation from the sun, and medical procedures. Nuclear power plants and other facilities, such as hospitals and universities, are permitted to release small amounts of radioactivity to the environment during routine operations. These releases are not harmful.

Health effects of radiation exposure

The health effects of radiation exposure to people are measured in units called millirems. In the United States, the average person is exposed to 620 millirems per year from all sources of radiation.

How much is too much radiation?

Health effects from radiation can be seen when exposures are close to 25,000 millirems and above. In Washington State, taking protective action is recommended based on trigger levels set by the U.S. Environmental Protection Agency (EPA)[1] and the U.S. Food and Drug Administration (FDA)[2]. These levels are much lower than the levels where health effects occur. At 1,000 millirems, residents must evacuate or shelter in place until the radioactive "plume" has passed.

[1] The Protective Action Guide (PAG) Manual (EPA 2017) may be found at epa.gov by searching 'PAG Manual' and contains radiation dose guidelines that would trigger public safety measures, such as evacuation or staying indoors, to minimize or prevent radiation exposure during an emergency. EPA developed Protective Action Guides to help responders plan for radiation emergencies.

[2] For more information on food and animal feeds guidance, the complete FDA guidance (FDA 1998) may be found at fda.gov by searching 'Accidental Radioactive Contamination.'

State authorities may implement additional protective actions including:

- relocation
- interdiction (prohibition) of food or milk sales, or
- acquiring alternate drinking water sources

How exposure to radiation will affect health depends on:

- the type of radiation
- how much radiation exposure occurred and how long the exposure lasted
- how much of the body is exposed
- how much radioactive material stays in the body
- the general health and age of the exposed person

Reducing radiation effects

- **TIME**: Limit the amount of time you are exposed to radiation.
- **DISTANCE**: The intensity from a radioactive source and therefore your dose lessens as you get farther away from that source.
- **SHIELDING**: Barriers — such as lead, concrete, or water — protect from radiation. This is why some radioactive materials are stored in water or lead-lined rooms. It's also why dentists place a lead blanket on patients receiving X-rays.

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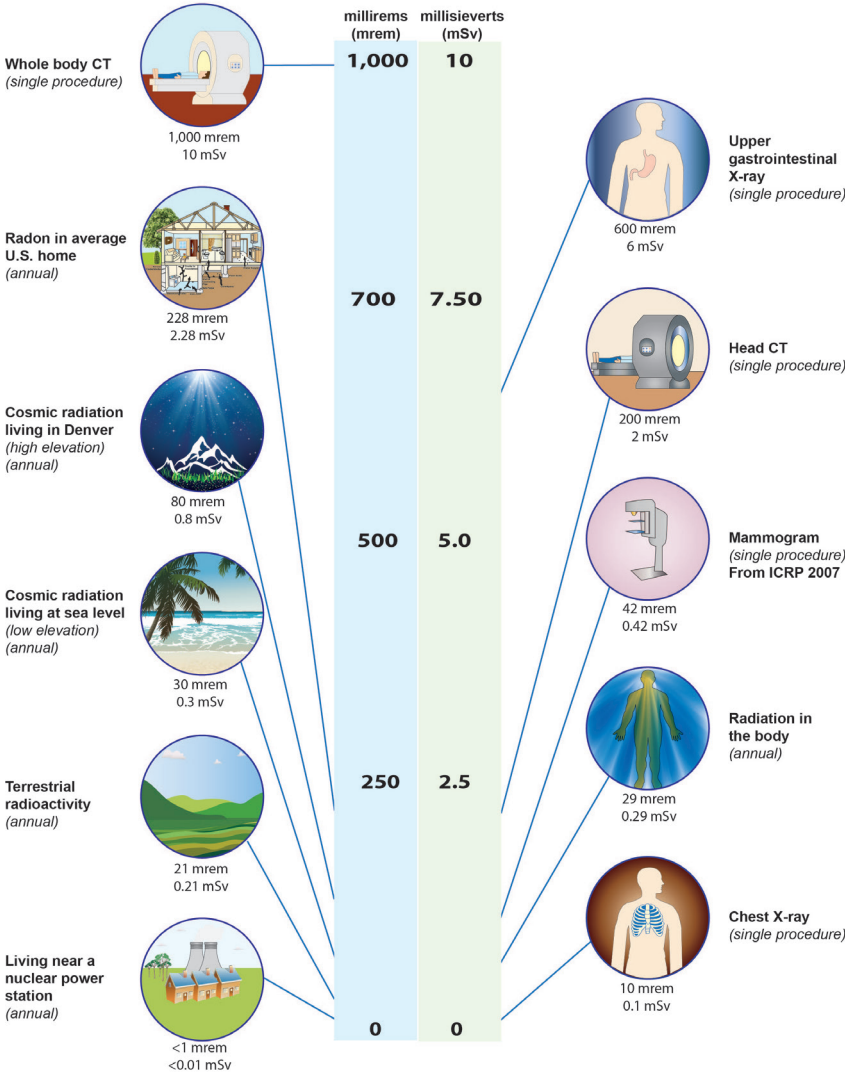
RELATIVE DOSES FROM RADIATION SOURCES

All doses from the National Council on Radiation Protection & Measurements, Report No. 160 (unless otherwise denoted)



Connect with your local emergency response organizations

Six counties in Washington State are involved with preparing for a possible emergency at either the Columbia Generating Station or the Hanford Nuclear Reservation. The state of Washington represents the interests of two other counties — Kittitas and Klickitat— in the preparation process because they have very small areas and populations that would be affected by an emergency at Energy Northwest's Columbia Generating Station reactor or the Hanford Nuclear Reservation.

For more information about emergency preparedness activities in your community, or additional copies of this booklet, contact the emergency management or emergency services office in your county. The booklet also can be found at the Washington Emergency Management Website at emd.wa.gov or from the Washington State Department of Agriculture at agr.wa.gov.

Adams County Emergency Management
www.co.adams.wa.us/departments/emergency_services/index.php
(509) 488-3704

Benton County Emergency Management
www.bces.wa.gov
(509) 628-2600

Franklin County Emergency Management
franklinem.org
(509) 545-3546

Grant County Emergency Management
www.grantcountywa.gov/374/Emergency-Operations
(509) 754-2011 ext. 2001

Kittitas County Emergency Management
www.co.kittitas.wa.us/sheriff/emergency.aspx
(509) 962-7525

Klickitat County Emergency Management
www.klickitatcounty.org/249/Emergency-Management
509-773-0582

Walla Walla County Emergency Management
www.co.walla-walla.wa.us/residents/emergency_management/index.php
(509) 524-2900

Yakima County Emergency Management
www.yakimacounty.us/350/Emergency-Management
(509) 574-1900

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