Glossary

ALARA An acronym for "as low as reasonably achievable." Used to describe an approach to radiation exposure and emissions control or management, whereby exposures and resulting doses to workers and the public are maintained as far below the specified limits as economic, technical, and practical considerations will permit.

Alpha Particle Type of particulate radiation emitted from the nucleus of an atom. It consists of two protons and two neutrons. It does not travel long distances and loses its energy quickly.

Aquifer A geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield economical quantities of water to wells and springs.

ARARs An acronym for "applicable or relevant and appropriate requirements." Requirements set forth in regulations that implement environmental and public health laws and must be attained or exceeded by a selected remedy unless a waiver is invoked. ARARs are divided into three categories: chemical-specific, location-specific, and action-specific, based on whether the requirement is triggered by the presence or emission of a chemical, by a vulnerable or protected location, or by a particular action.

Background Radiation Particle or wave energy spontaneously released from atomic nuclei in the natural environment, including cosmic rays and such releases from naturally radioactive elements both outside and inside the bodies of humans and animals, and fallout from nuclear weapons tests.

Beta Particle Type of particulate radiation emitted from the nucleus of an atom that has a mass and charge equal in magnitude to that of the electron.

Bypass Events A bypass event occurs when storm water is diverted around treatment and is directly discharged to the Great Miami River via the Fernald site effluent line. Bypass events can occur during significant precipitation or when water treatment facilities are down for maintenance. Bypassing treatment is only implemented when the site's storm water retention capacity is in danger of being exceeded.

Capture Zone Estimated area that is being "captured" by the pumping of groundwater extraction wells. The definition of the capture zone is important in ensuring that the uranium plumes targeted for cleanup are being remediated.

Certification The process by which a soil remediation area is certified as clean. Samples from the area are collected and analyzed, and the contaminant levels compared to the final remedial levels established in the Operable Unit 5 Record of Decision. Not all soil remediation areas at the Fernald site require excavation before certification is done.

Contaminant A substance that when present in air, surface water, sediment, soil, or groundwater above naturally occurring (background) levels causes degradation of the media.

Controlled Runoff Contaminated storm water requiring treatment; it is collected, treated, and eventually discharged to the Great Miami River as treated effluent.

Curie (Ci) Unit of radioactivity that measures the rate of spontaneous, energy-emitting transformations in the nuclei of atoms.

Dose Quantity of radiation absorbed in tissue.

Ecological Receptor A biological organism selected by ecological risk assessors to represent a target species most likely to be affected by site-related chemicals, especially through bioaccumulation. Such organisms may include terrestrial and aquatic species.

Effective Dose Equivalent The sum of the products of the dose equivalent received by specified tissues of the body and tissue-specific weighting factor. This sum is a risk-equivalent value and can be used to estimate the risk of health effects to the exposed individual. The tissue-specific weighting factor represents the fraction of the total health risk resulting from uniform whole-body irradiation that would be contributed by that particular tissue. The effective dose equivalent includes the committed effective dose equivalent from internal deposition of radionuclides and the effective dose equivalent due to penetrating radiation from sources external to the body. Effective dose equivalent is expressed in units of rem (or Sievert).

Exposure Pathway A route by which materials could travel between the point of release and the point of delivery of a radiation or chemical dose to a receptor organism.

Flyash The ash remaining after the burning of coal in a boiler plant.

Gamma Ray Type of electromagnetic radiation of discrete energy emitted during radioactive decay of many radioactive elements.

Glacial Overburden/Glacial Till Silt, sand, gravel, and clay deposited by glacial action on top of the Great Miami Aquifer and surrounding bedrock highs.

Great Miami Aquifer Sand and gravel deposited by the meltwaters of Pleistocene glaciers within the entrenched ancestral Ohio and Miami rivers. This is also called a buried channel, or sand and gravel aquifer.

Groundwater Water in a saturated zone or stratum beneath the surface of land.

Head Works Includes the various flow equalization basins or preliminary treatment units that serve as the central collection and distribution points to the wastewater treatment operations in the main facility.

Mixed Waste Hazardous waste that has been contaminated with low-level radioactive materials.

Opacity The amount of light that is blocked by particulates present in stack emissions.

Overpacking The act of placing a deteriorating drum inside a new, larger drum to prevent further deterioration or the possible release of contaminants during storage.

Point Source The single defined point (origin) of a release such as a stack, vent, or other discernable conveyance.

Radiation The energy released as particles or waves when an atom's nucleus spontaneously loses or gains neutrons and/or protons. The three main types are alpha particles, beta particles, and gamma rays.

Radioactive Material Refers to any material or combination of materials that spontaneously emits ionizing radiation.

Radionuclide Refers to a radioactive nuclide. There are several hundred known radionuclides, both artificially produced and naturally occurring. Radionuclides are characterized by the number of neutrons and protons in an atom's nucleus and their characteristic decay processes.

Receptors Individuals or organisms that are or could be impacted by contamination.

Remedial Action The actual construction and implementation phase of a Superfund site cleanup that follows the remedy selection process and remedial design.

Remedial Investigation/Feasibility Study The first major event in the remedial action process that serves to assess site conditions and evaluate alternatives to the extent necessary to select a remedy.

Removal Action A short-term cleanup or removal of released hazardous substances from the environment. This occurs in the event of a release or the imminent threat of release of hazardous substances into the environment.

Roentgen Equivalent Man (Rem) A special unit of dose equivalent that expresses the effective dose calculated for all radiation on a common scale; the absorbed dose in rads multiplied by certain modifying factors (e.g., quality factor); 100 rem = 1 Sievert.

Sediment The unconsolidated inorganic and organic material that is suspended in surface water and is either transported by the water or has settled out and become deposited in beds.

Source A controlled source of radioactive material used to calibrate radiation detection equipment. Can also be used to refer to any source of contamination (e.g., a point source such as the stack on the waste pits stack, a source of radon such as the silos' headspace, etc.).

Surface Water Water that is flowing within natural drainage features.

Treated Effluent Water from numerous sources at the site, which is treated through one of the site's wastewater treatment facilities and discharged to the Great Miami River.

Thermoluminescent Dosimeter A device used to monitor the amount of radiation to which it has been exposed.

Uncontrolled Runoff Storm water that is not collected by the site for treatment, but enters the site's natural drainages.

Volatile Organic Compound A hydrocarbon compound, except methane and ethane, with a vapor pressure equal to or greater than 0.1 millimeter of mercury.

Waste Acceptance Criteria Disposal facilities specify the types and sizes of materials, acceptable levels of constituents, and other criteria for all material that will be disposed in that facility. These are known as waste acceptance criteria. Off-site disposal facilities (such as the Nevada Test Site) that will dispose of Fernald waste have specific waste acceptance criteria. In addition, the on-site disposal facility has waste acceptance criteria that have been approved by the regulatory agencies. The Waste Acceptance Organization is responsible for ensuring that all waste to be placed in the on-site disposal facility meets all these criteria before waste placement.