

CHAPTER 8
GLOSSARY

8.0 GLOSSARY

absorbed dose—For ionizing radiation, the energy imparted to matter by ionizing radiation per unit mass of the irradiated material (such as biological tissue). The units of absorbed dose are the rad and the gray. (See rad and gray.)

accident sequence—With regard to nuclear facilities, an initiating event followed by system failures or operator errors, which can result in significant core damage, confinement system failure, and/or radionuclide releases.

actinide—Any member of the group of elements with atomic numbers from 89 (actinium) to 103 (lawrencium) including uranium and plutonium. All members of this group are radioactive.

activation products—Nuclei, usually radioactive, formed by the bombardment and absorption in material with neutrons, protons, or other nuclear particles.

administrative control level—A dose level that is established well below the regulatory limit to administratively control and help reduce individual and collective radiation doses. Facility management should establish an annual facility administrative control level that should, to the extent feasible, be more restrictive than the more general administrative control level.

air pollutant—Generally, an airborne substance that could, in high enough concentrations, harm living things or cause damage to materials. From a regulatory perspective, an air pollutant is a substance for which emissions or atmospheric concentrations are regulated, or for which maximum guideline levels have been established because of potential harmful effects on human health and welfare.

air quality control region—Geographic subdivisions of the United States, designed to deal with pollution on a regional or local level. Some regions span more than one state.

alluvium—Sediment deposited by flowing water, as in a riverbed, flood plain, or delta.

alpha activity—The emission of alpha particles by radioactive materials.

alpha particle—A positively charged particle ejected spontaneously from the nuclei of some radioactive elements. It is identical to a helium nucleus and has a mass number of 4 and an electrostatic charge of +2. It has low penetrating power and a short range (a few centimeters in air). (See alpha radiation.)

alpha radiation—A strongly ionizing, but weakly penetrating, form of radiation consisting of positively charged alpha particles emitted spontaneously from the nuclei of certain elements during radioactive decay. Alpha radiation is the least penetrating of the three common types of ionizing radiation (alpha, beta, and gamma). Even the most energetic alpha particle generally fails to penetrate the dead layers of cells covering the skin and can be easily stopped by a sheet of paper. Alpha radiation is most hazardous when an alpha-emitting source resides inside an organism. (See alpha particle.)

ambient—Surrounding.

ambient air—The surrounding atmosphere as it exists around people, plants, and structures.

ambient air quality standards—The level of pollutants in the air prescribed by regulations that may not be exceeded during a specified time in a defined area. Air quality standards are used to provide a measure of the health-related and visual characteristics of the air.

analytical chemistry—The branch of chemistry that deals with the separation, identification, and determination of the components of a sample.

aquatic—Living or growing in, on, or near water.

aquifer—An underground geological formation, group of formations, or part of a formation that is capable of yielding a significant amount of water to wells or springs.

archaeological sites (resources)—Any location where humans have altered the terrain or discarded artifacts during either prehistoric or historic times.

Area of Concern (AOC)—Any area that may have had a release of a hazardous waste or hazardous constituent, which is not a Solid Waste Management Unit.

artifact—An object produced or shaped by human workmanship of archaeological or historical interest.

as low as is reasonably achievable (ALARA)—An approach to radiation protection to manage and control worker and public exposures (both individual and collective) and releases of radioactive material to the environment to as far below applicable limits as social, technical, economic, practical, and public policy considerations permit. ALARA is not a dose limit but a process for minimizing doses to as far below limits as is practicable.

atmospheric dispersion—The process of air pollutants being dispersed in the atmosphere. This occurs by the wind that carries the pollutants away from their source, by turbulent air motion that results from solar heating of the Earth's surface, and air movement over rough terrain and surfaces.

Atomic Energy Act—A law originally enacted in 1946 and replaced in 1954 that placed nuclear production and control of nuclear materials within a civilian agency, originally the Atomic Energy Commission. The functions of the Atomic Energy Commission were replaced by the U.S. Nuclear Regulatory Commission and the U.S. Department of Energy.

Atomic Energy Commission—A five-member commission, established by the Atomic Energy Act of 1946, to supervise nuclear weapons design, development, manufacturing, maintenance, modification, and dismantlement. In 1974, the Atomic Energy Commission was abolished, and all functions were transferred to the Nuclear Regulatory Commission and the Administrator of the Energy Research and Development Administration. The Energy Research and Development Administration was later terminated, and functions vested by law in the Administrator were transferred to the Secretary of Energy.

atomic number—The number of positively charged protons in the nucleus of an atom or the number of electrons on an electrically neutral atom.

attainment area—An area that the U.S. Environmental Protection Agency has designated as being in compliance with one or more of the National Ambient Air Quality Standards for sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter. An area may be in attainment for some pollutants but not for others. (See National Ambient Air Quality Standards, nonattainment area, and particulate matter.)

attractiveness level—A categorization of nuclear material types and compositions that reflects the relative ease of processing and handling required to convert that material to a nuclear explosive device.

backfill—The replacement of excavated earth or other material into an open trench, cavity, or other opening in the earth.

background radiation—Radiation from (1) cosmic sources, (2) naturally occurring radioactive materials, including radon (except as a decay product of source or special nuclear material), and (3) global fallout as it exists in the environment (such as from the testing of nuclear explosive devices).

barrier—Any material or structure that prevents or substantially delays movement of pollutants or materials containing radionuclides toward the accessible environment.

basalt—The most common volcanic rock, dark gray to black in color, high in iron and magnesium and low in silica. It is typically found in lava flows.

baseline—The existing environmental conditions against which impacts of the Proposed Action and its alternatives can be compared. The environmental baseline is the site environmental conditions as they exist or are estimated to exist in the absence of the Proposed Action.

basin—Geologically, a circular or elliptical downwarp or depression in the Earth's surface that collects sediment. Younger sedimentary beds occur in the center of basins. Topographically, a depression into which water from the surrounding area drains.

becquerel—A unit of radioactivity equal to one disintegration per second. Thirty-seven billion becquerels is equal to 1 curie.

bedrock—The solid rock that lies beneath soil and other loose surface materials.

BEIR VII—Biological Effects of Ionizing Radiation; referring to the seventh in a series of committee reports from the National Research Council.

benthic—Plants and animals dwelling at the bottom of oceans, lakes, rivers, and other surface waters.

beryllium—An extremely light-weight element with the atomic number 4. It is metallic and is used in reactors as a neutron reflector.

best management practices—Structural, nonstructural, and managerial techniques, other than effluent limitations, to prevent or reduce pollution of surface water. They are the most effective and practical means to control pollutants that are compatible with the productive use of the resource to which they are applied. Best Management Practices are used in both urban and agricultural areas. Best Management Practices can include schedules of activities; prohibitions of practices; maintenance procedures; treatment requirements; operating procedures; and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

beta particle—A particle emitted in the radioactive decay of many radionuclides. A beta particle is identical to an electron. It has a short range in air and a small ability to penetrate other materials.

biomimetic—Imitating, copying, or learning from nature.

biota (biotic)—The plant and animal life of a region (pertaining to biota).

block—U.S. Bureau of the Census term describing small areas bounded on all sides by visible features or political boundaries; used in tabulation of census data.

boron-10—An isotope of the element boron that has a high capture cross section for neutrons. It is used in reactor absorber rods for reactor control.

borrow—Excavated material that has been taken from one area to be used as raw material or fill at another location.

bound—To use simplifying assumptions and analytical methods in analyzing potential impacts or risks such that the result provides an overestimate or upper limit that “bounds” the potential impacts or risks.

bounded—Producing the greatest consequences of any assessment of impacts associated with normal or abnormal operations.

Breccia—Rock composed of sharp-angled fragments embedded in a fine-grained matrix.

burial ground—In regard to radioactive waste, a place for burying unwanted radioactive materials in which the earth acts as a receptacle to prevent the escape of radiation and the dispersion of waste into the environment.

cancer—The name given to a group of diseases characterized by uncontrolled cellular growth, with cells having invasive characteristics such that the disease can transfer from one organ to another.

canister—A general term for a container, usually cylindrical, used in handling, storage, transportation, or disposal of waste.

capable fault—A fault that has exhibited one or more of the following characteristics: (1) movement at or near the ground surface at least once within the past 35,000 years, or movement of a recurring nature within the past 500,000 years; (2) macro-seismicity instrumentally determined with records of sufficient precision to demonstrate a direct relationship with the fault; (3) a structural relationship to a capable fault according to characteristic (1) or (2) above, such that movement on one could be reasonably expected to be accompanied by movement on the other.

carbon dioxide—A colorless, odorless gas that is a normal component of ambient air; it results from fossil fuel combustion, and is an expiration product.

carbon monoxide—A colorless, odorless, poisonous gas produced by incomplete fossil fuel combustion.

carcinogen—An agent that may cause cancer. Ionizing radiation is a physical carcinogen; there are also chemical and biological carcinogens, and biological carcinogens may be external (such as viruses) or internal (such as genetic defects).

cask—A heavily shielded container used to store or ship radioactive materials.

categories of special nuclear material (Categories I, II, III, and IV)—A designation determined by the quantity and type of special nuclear material or a designation of a special nuclear material location based on the type and form of the material and the amount of nuclear material present. A designation of the significance of special nuclear material based upon the material type, form of the material, and amount of material present in an item, grouping of items, or in a location

cation—A positively charged ion.

cavate—Consists of a room carved into a cliff face within the Bandelier Tuff geological formation. The category includes isolated cavates, multi-roomed contiguous cavates, and groups of adjacent cavates that together form a cluster or complex.

cell—See hot cell.

chain reaction—A reaction that initiates its own repetition. In nuclear fission, a chain reaction occurs when a neutron induces a nucleus to fission and the fissioning nucleus releases one or more neutrons which induce other nuclei to fission.

chemical wastes—Defined as hazardous waste (designated under the Resource Conservation and Recovery Act regulations); toxic waste (asbestos and polychlorinated biphenyls, designated under the Toxic Substances Control Act); and special waste (designated under the New Mexico Solid Waste Regulations and including industrial waste, infectious waste, and petroleum contaminated soils). In the past, LANL tracking efforts for chemical waste included construction and demolition debris and all other non-radioactive waste that managed through the Solid Chemical and Radioactive Waste Facilities. For waste projections in this SWEIS, construction and demolition debris are presented as a separate categories.

classified information—(1) Information that has been determined pursuant to Executive Order 12958, any successor order, or the Atomic Energy Act of 1954 (42 U.S.C. 2011) to require protection against unauthorized disclosure; (2) certain information requiring protection against unauthorized disclosure in the interest of national defense and security or foreign relations of the United States pursuant to Federal statute or Executive Order.

clay—The name for a family of finely crystalline sheet silicate minerals that commonly form as a product of rock weathering. Also, any particle smaller than or equal to about 0.002 millimeters (0.00008 inches) in diameter.

Clean Air Act—This Act mandates and provides for enforcement of regulations to control air pollution from various sources.

Clean Water Act of 1972, 1987—This Act regulates the discharge of pollutants from a point source into navigable waters of the United States in compliance with a National Pollutant Discharge Elimination System permit, and regulates discharges to or dredging of wetlands.

Code of Federal Regulations (CFR)—All Federal regulations in effect are published in codified form in the CFR. References to the CFR usually take the form of XX CFR Part YY, where XX refers to Title (major division) and YY refers to Part (section).

collective dose—The sum of the individual doses received in a given period of time by a specified population from exposure to a specified source of radiation. Collective dose is expressed in units of person-rem or person-sievert.

colluvium (colluvial)—A loose deposit of rock debris accumulated at the base of a cliff or slope.

committed dose equivalent—The dose equivalent to organs or tissues that will be received by an individual during the 50-year period following the intake of radioactive material. It does not include contributions from radiation sources external to the body. Committed dose equivalent is expressed in units of rems or sieverts.

committed effective dose equivalent—The dose value obtained by—(1) multiplying the committed dose equivalents for the organs or tissues that are irradiated and the weighting factors applicable to those organs or tissues, and (2) summing all the resulting products. Committed effective dose equivalent is expressed in units of rem or sievert. (See committed dose equivalent and weighting factor.)

community (biotic)—All plants and animals occupying a specific area under relatively similar conditions.

community (environmental justice definition)—A group of people or a site within a spatial scope exposed to risks that potentially threaten health, ecology, or land values; or are exposed to industry that stimulates unwanted noise, smell, industrial traffic, particulate matter, or other nonaesthetic impacts.

Compliance Order on Consent (Consent Order)—An enforcement document signed by the New Mexico Environment Department, the U.S. Department of Energy, and the Regents of the University of California on March 1, 2005, which prescribes the requirements for corrective action at Los Alamos National Laboratory. The purposes of the Consent Order are (1) to define the nature and extent of releases of contaminants at, or from, the facility; (2) to identify and evaluate, where needed, alternatives for corrective measures to clean up contaminants in the environment and prevent or mitigate the migration of contaminants at, or from, the facility; and (3) to implement such corrective measures. The Consent Order supersedes the corrective action requirements previously specified in Module VIII of the LANL Hazardous Waste Facility Permit.

conformity—Conformity is defined in the Clean Air Act as the action's compliance with an implementation plan's purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards, and achieving expeditious attainment of such standards; and that such activities will not: (1) cause or contribute to any new violation of any standard in any area; (2) increase the frequency or severity of any existing violation of any standard in any area; or (3) delay timely attainment of any standard or any required interim emission reduction, or other milestones in any area.

contact-handled waste—Radioactive waste or waste packages whose external dose rate is low enough to permit contact handling by humans during normal waste management activities, (such as waste with a surface dose rate not greater than 200 millirem per hour). (See remote-handled waste.)

container—With regard to radioactive wastes, the metal envelope in the waste package that provides the primary containment function of the waste package.

contamination—The deposition of undesirable radioactive material on the surfaces of structures, areas, objects, or personnel.

control rod—A rod containing material such as boron that is used to control the power of a nuclear reactor. By absorbing excess neutrons, a control rod prevents the neutrons from causing further fissions that would increase power generation.

coolant—A substance, either gas or liquid, circulated through a nuclear reactor or processing plant to remove heat.

criteria pollutants—An air pollutant that is regulated by National Ambient Air Quality Standards. The U.S. Environmental Protection Agency must describe the characteristics and potential health and welfare effects that form the basis for setting, or revising, the standard for each regulated pollutant. Criteria pollutants include sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and two size classes of particulate matter, less than or equal to 10 micrometers (0.0004 inch) in diameter, and less than or equal to 2.5 micrometers (0.0001 inch) in diameter. New pollutants may be added to, or removed from, the list of criteria pollutants as more information becomes available. (See National Ambient Air Quality Standards.)

critical assembly—A critical assembly is a system of fissile material (uranium-233, uranium-235, plutonium-239, or plutonium-241) with or without a moderator in a specific proportion and shape. The critical assembly can be gradually built up by adding additional fissile material and/or moderator until this system achieves the dimensions necessary for a criticality condition. A continuous neutron source is placed at the center of this assembly to measure the fission rate of the critical assembly as it approaches and reaches criticality.

critical habitat—Habitat essential to the conservation of an endangered or threatened species that has been designated as critical by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service following the procedures outlined in the Endangered Species Act and its implementing regulations (50 CFR Part 424). The lists of Critical Habitats can be found in 50 CFR 17.95 (fish and wildlife), 50 CFR 17.96 (plants), and 50 CFR Part 226 (marine species). (See endangered species and threatened species.)

critical mass—The smallest mass of fissionable material that will support a self-sustaining nuclear chain reaction.

criticality—The condition in which a system is capable of sustaining a nuclear chain reaction.

cultural resources—Archaeological materials (artifacts) and sites that date to the prehistoric, historic, and ethnohistoric periods and that are currently located on the ground surface or buried beneath it; standing structures and/or their component parts that are over 50 years of age and are important because they represent a major historical theme or era, including the Manhattan Project and the Cold War era and structures that have an important technological, architectural, or local significance; cultural and natural places, select natural resources, and sacred objects that have importance for American Indians; American folklife traditions and arts; “historic properties” as defined in the National Historic Preservation Act; “archaeological resource” as defined in the Archaeological Resources Protection Act; and “cultural items” as defined in the Native American Graves Protection and Repatriation Act.

cumulative impacts—The impacts on the environment that result from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions, regardless of the agency or person who undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

curie—A unit of radioactivity equal to 37 billion disintegrations per second (37 billion becquerels); also a quantity of any radionuclide or mixture of radionuclides having 1 curie of radioactivity.

deactivation—The placement of a facility in a radiologically and industrially safe shutdown condition that is suitable for a long-term surveillance and maintenance phase prior to final decontamination and decommissioning.

decay (radioactive)—The decrease in the amount of any radioactive material with the passage of time due to spontaneous nuclear disintegration (the emission from atomic nuclei of charged particles, photons, or both).

decibel (dB)—A unit for expressing the relative intensity of sounds on a logarithmic scale where 0 is below human perception and 130 is above the threshold of pain to humans. For traffic and industrial noise measurements, the A-weighted decibel, a frequency-weighted noise unit, is widely used. The A-weighted decibel scale corresponds approximately to the frequency response of the human ear and thus correlates well with loudness.

decibel, A-weighted (dBA)—A unit of frequency-weighted sound pressure level, measured by the use of a metering characteristic and the “A” weighting specified by the American National Standards Institution (ANSI S1.4-1983 [R1594]) that accounts for the frequency response of the human ear.

decommissioning—Retirement of a facility, including any necessary decontamination and dismantlement.

decontamination—The actions taken to reduce or remove substances that pose a substantial present or potential hazard to human health or the environment, such as radioactive or chemical contamination, from facilities, equipment, or soils by washing, heating, chemical or electrochemical action, mechanical cleaning, or other techniques.

decontamination, decommissioning, and demolition (DD&D) – actions taken at the end of the useful life of a building or structure to reduce or remove substances that pose a substantial hazard to human health or the environment, retire it from service, and ultimately eliminate all or a portion of the structure.

degrees C (degrees Celsius)—A unit for measuring temperature using the centigrade scale in which the freezing point of water is 0 degrees and the boiling point is 100 degrees.

degrees F (degrees Fahrenheit)—A unit for measuring temperature using the Fahrenheit scale in which the freezing point of water is 32 degrees and the boiling point is 212 degrees.

depleted uranium—Uranium whose content of the fissile isotope uranium-235 is less than the 0.7 percent (by weight) found in natural uranium, so that it contains more uranium-238 than natural uranium. (See enriched uranium, highly enriched uranium, natural uranium, low-enriched uranium, and uranium.)

deposition—In geology, the laying down of potential rock-forming materials; sedimentation. In atmospheric transport, the settling on ground and building surfaces of atmospheric aerosols and particles (“dry deposition”) or their removal from the air to the ground by precipitation (“wet deposition” or “rainout”).

design basis—For nuclear facilities, information that identifies the specific functions to be performed by a structure, system, or component, and the specific values (or ranges of values) chosen for controlling parameters for reference bounds for design. These values may be: (1) restraints derived from generally accepted state-of-the-art practices for achieving functional goals; (2) requirements derived from analysis (based on calculation and/or experiments) of the effects of a postulated accident for which a structure, system, or component must meet its functional goals; or (3) requirements derived from Federal safety objectives, principles, goals, or requirements.

dewatering—The removal of water. Saturated soils are “dewatered” to make construction of building foundations easier.

discharge—In surface water hydrology, the amount of water issuing from a spring or in a stream that passes a specific point in a given period of time.

disposition—The ultimate “fate” or end use of a surplus U.S. Department of Energy facility following the transfer of the facility to the Office of the Assistant Secretary for Environmental Management.

diversion—The unauthorized removal of nuclear material from its approved use or authorized location.

DOE Orders—Requirements internal to the U.S. Department of Energy (DOE) that establish DOE policy and procedures, including those for compliance with applicable laws.

dose (radiological)—A generic term meaning absorbed dose, dose equivalent, effective dose equivalent, committed dose equivalent, committed effective dose equivalent, or committed equivalent dose, as defined elsewhere in this glossary. It is a measure of the energy imparted to matter by ionizing radiation. The unit of dose is the rem or rad.

dose equivalent—A measure of radiological dose that correlates with biological effect on a common scale for all types of ionizing radiation. Defined as a quantity equal to the absorbed dose in tissue multiplied by a quality factor (the biological effectiveness of a given type of radiation) and all other necessary modifying factors at the location of interest. The units of dose equivalent are the rem and sievert.

dose rate—The radiation dose delivered per unit of time (such as rem per year).

dosimeter—A small device (instrument) carried by a radiation worker that measures cumulative radiation dose (such as a film badge or ionization chamber).

drinking water standards—The level of constituents or characteristics in a drinking water supply specified in regulations under the Safe Drinking Water Act as the maximum permissible.

ecology—A branch of science dealing with the interrelationships of living organisms with one another and with their nonliving environment.

ecosystem—A community of organisms and their physical environment interacting as an ecological unit.

effective dose equivalent—The dose value obtained by multiplying the dose equivalents received by specified tissues or organs of the body by the appropriate weighting factors applicable to the tissues or organs irradiated, and then summing all of the resulting products. It includes the dose from radiation sources internal and external to the body. The effective dose equivalent is expressed in units of rems or sieverts. (See committed dose equivalent and committed effective dose equivalent.)

effluent—A waste stream flowing into the atmosphere, surface water, groundwater, or soil. Most frequently the term applies to wastes discharged to surface waters.

electron—An elementary particle with a mass of 9.107×10^{-28} gram (or 1/1,837 of a proton) and a negative charge. Electrons surround the positively charged nucleus and determine the chemical properties of the atom.

emission—A material discharged into the atmosphere from a source operation or activity.

emission standards—Legally enforceable limits on the quantities and/or kinds of air contaminants that can be emitted into the atmosphere.

endangered species—Plants or animals that are in danger of extinction through all or a significant portion of their ranges and that have been listed as endangered by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service following the procedures outlined in the Endangered Species Act and its implementing regulations (50 CFR Part 424). The lists of endangered species can be found in 50 CFR 17.11 for wildlife, 50 CFR 17.12 for plants, and 50 CFR 222.23(a) for marine organisms. (See threatened species.)

enriched uranium—Uranium whose content of the fissile isotope uranium-235 is greater than the 0.7 percent (by weight) found in natural uranium. (See depleted uranium, uranium, natural uranium, low-enriched uranium, and highly enriched uranium.)

Environment, Safety, and Health Program—In the context of the U.S. Department of Energy (DOE), encompasses those requirements, activities, and functions in the conduct of all DOE and DOE-controlled operations that are concerned with impacts to the biosphere; compliance with environmental laws, regulations, and standards controlling air, water, and soil pollution; limiting the risks to the well-being of both operating personnel and the general public; and protecting property against accidental loss and damage. Typical activities and functions related to this program include, but are not limited to, environmental protection, occupational safety, fire protection, industrial hygiene, health physics, occupational medicine, process and facility safety, nuclear safety, emergency preparedness, quality assurance, and radioactive and hazardous waste management.

environmental impact statement (EIS)—The detailed written statement required by the National Environmental Policy Act (NEPA) section 102(2)(C) for a proposed major Federal action significantly affecting the quality of the human environment. A U.S. Department of Energy (DOE) EIS is prepared in accordance with applicable requirements of the Council on Environmental Quality National Environmental Policy Act regulations in 40 CFR Parts 1500 to 1508 and DOE NEPA regulations in 10 CFR Part 1021. The statement includes, among other information, discussions of the environmental impacts of the Proposed Action and all reasonable alternatives, adverse environmental effects that cannot be avoided should the proposal be implemented, the relationship between short-term uses of the human environment and enhancement of long-term productivity, and any irreversible and irretrievable commitments of resources.

environmental justice—The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, local, and tribal programs and policies. Executive Order 12898 directs Federal agencies to make achieving environmental justice part of their missions by identifying and addressing disproportionately high and adverse effects of agency programs, policies, and activities on minority and low-income populations. (See minority population and low-income population.)

ephemeral stream—A stream that flows only after a period of heavy precipitation.

epidemiology—Study of the occurrence, causes, and distribution of disease or other health-related states and events in human populations, often as related to age, sex, occupation, ethnicity, and economic status, to identify and alleviate health problems and promote better health.

excavation—A cavity in the Earth's surface formed by cutting, digging, or scooping by excavating, such as with the use of heavy construction equipment.

exposure limit—The level of exposure to a hazardous chemical (set by law or a standard) at which or below which adverse human health effects are not expected to occur.

fault—A fracture or a zone of fractures within a rock formation along which vertical, horizontal, or transverse slippage has occurred. A normal fault occurs when the hanging wall has been depressed in relation to the footwall. A reverse fault occurs when the hanging wall has been raised in relation to the footwall.

fissile materials—An isotope that readily fissions after absorbing a neutron of any energy, either fast or slow. Fissile materials are uranium-235, uranium-233, plutonium-239, and plutonium-241. Uranium-235 is the only naturally occurring fissile isotope. Although sometimes used as a synonym for fissionable material, this term has acquired a more restricted meaning, namely, any material fissionable by thermal (slow) neutrons. The three primary fissile materials are uranium-233, uranium-235, and plutonium-239.

fission—The splitting of the nucleus of a heavy atom into two lighter nuclei. It is accompanied by the release of neutrons, gamma rays, and kinetic energy of fission products.

fission products—Nuclei (fission fragments) formed by the fission of heavy elements, plus the nuclides formed by the fission fragments' radioactive decay.

floodplain—The lowlands and relatively flat areas adjoining inland and coastal waters and the flood prone areas of offshore islands. Floodplains include, at a minimum, that area with at least a 1.0 percent chance of being inundated by a flood in any given year.

The *base floodplain* is defined as the area that has a 1.0 percent or greater chance of being flooded in any given year. Such a flood is known as a 100-year flood.

The *critical action floodplain* is defined as the area that has at least a 0.2 percent chance of being flooded in any given year. Such a flood is known as a 500-year flood. Any activity for which even a slight chance of flooding would be too great (such as storage of highly volatile, toxic, or water-reactive materials) should not occur in the critical action floodplain.

The *probable maximum flood* is the hypothetical flood considered to be the most severe reasonably possible flood, based on the comprehensive hydrometeorological application of maximum precipitation and other hydrological factors favorable for maximum flood runoff (such as sequential storms and snowmelts). It is usually several times larger than the maximum recorded flood.

flux—Rate of flow through a unit area; in reactor operation, the apparent flow of neutrons in a defined energy range. (See neutron flux.)

formation—In geology, the primary unit of formal stratigraphic mapping or description. Most formations possess certain distinctive features.

fugitive emissions—(1) Emissions that do not pass through a stack, vent, chimney, or similar opening where they could be captured by a control device, or (2) any air pollutant emitted to the atmosphere other than from a stack. Sources of fugitive emissions include pumps; valves; flanges; seals; area sources such as ponds, lagoons, landfills, piles of stored material (such as coal); and road construction areas or other areas where earthwork is occurring.

gabions—Wire mesh boxes filled with rock used as a nonvegetative stabilization measure.

gamma radiation—High-energy, short wavelength, electromagnetic radiation emitted from the nucleus of an atom during radioactive decay. Gamma radiation frequently accompanies alpha and beta emissions and always accompanies fission. Gamma rays are very penetrating and are best stopped or shielded by dense materials, such as lead or depleted uranium. Gamma rays are similar to, but are usually more energetic than, x-rays.

genetic effects—Inheritable changes (chiefly mutations) produced by exposure to ionizing radiation or other chemical or physical agents of the parts of cells that control biological reproduction and inheritance.

genomics—The study of genes and their function.

geology—The science that deals with the Earth—the materials, processes, environments, and history of the planet, including rocks and their formation and structure.

glovebox—Large enclosure that separates workers from equipment used to process hazardous material, while allowing the workers to be in physical contact with the equipment; normally constructed of stainless steel, with large acrylic/lead glass windows. Workers have access to equipment through the use of heavy-duty, lead-impregnated rubber gloves, the cuffs of which are sealed in portholes in the glovebox windows.

graben—A usually elongated depression between geologic faults.

grading—Any stripping, cutting, filling, stockpiling, or combination thereof that modifies the land surface.

ground shine—The radiation dose received from an area on the ground where radioactivity has been deposited by a radioactive plume or cloud.

groundwater—Water below the ground surface in a zone of saturation.

habitat—The environment occupied by individuals of a particular species, population, or community.

half-life—The time in which one-half of the atoms of a particular radioactive isotope disintegrate to another nuclear form. Half-lives vary from millionths of a second to billions of years.

Hazard Index—The ratio of the potential exposure to a substance and the highest exposure level at which no adverse effects are expected. If the Hazard Index is calculated to be less than 1, then no adverse health effects are expected as a result of exposure. If the Hazard Index is greater than 1, then adverse health effects are possible.

hazardous air pollutants—Air pollutants not covered by ambient air quality standards but which may present a threat of adverse human health effects or adverse environmental effects. Those specifically listed in 40 CFR 61.01 are asbestos, benzene, beryllium, coke oven emissions, inorganic arsenic, mercury, radionuclides, and vinyl chloride. More broadly, hazardous air pollutants are any of the 189 pollutants listed in or pursuant to the Clean Air Act, Section 112(b). Very generally, hazardous air pollutants are any air pollutants that may realistically be expected to pose a threat to human health or welfare.

hazardous chemical—Under 29 CFR Part 1910 Subpart Z, hazardous chemicals are defined as “any chemical which is a physical hazard or a health hazard.” Physical hazards include combustible liquids, compressed gases, explosives, flammables, organic peroxides, oxidizers, pyrophorics, and reactives. A health hazard is any chemical for which there is good evidence that acute or chronic health effects occur in exposed employees. Hazardous chemicals include carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, agents that act on the hematopoietic system, and agents that damage the lungs, skin, eyes, or mucous membranes.

hazardous material—A material, including a hazardous substance, as defined by 49 CFR 171.8, that poses a risk to health, safety, and property when transported or handled.

hazardous waste—A category of waste regulated under the Resource Conservation and Recovery Act (RCRA). To be considered hazardous, a waste must be a solid waste under RCRA and must exhibit at least one of four characteristics described in 40 CFR 261.20-24 (ignitability, corrosivity, reactivity, or toxicity) or be specifically listed by the U.S. Environmental Protection Agency in 40 CFR 261.31-33.

hazards classification—The process of identifying the potential threat to human health of a chemical substance.

high-efficiency particulate air (HEPA) filter—An air filter capable of removing at least 99.97 percent of particles 0.3 micrometers (about 0.00001 inches) in diameter. High-efficiency particulate air filters include a pleated fibrous medium (typically fiberglass) capable of capturing very small particles.

high-level radioactive waste—High level waste is the highly radioactive waste material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and other highly radioactive material that is determined, consistent with existing law, to require permanent isolation.

highly enriched uranium—Uranium whose content of the fissile isotope uranium-235 has been increased through enrichment to 20 percent or more (by weight). (See uranium, natural uranium, enriched uranium, highly enriched uranium, and depleted uranium.)

historic artifact scatter/trash scatter—A concentration of items produced and deposited after AD 1593 (but most typically in the Los Alamos area deposited after about AD 1900).

historic resources—Archaeological sites, architectural structures, and objects produced after the advent of written history, dating to the time of the first European-American contact in an area.

historic structure—A building or other structure constructed after AD 1593 (but most typically in the Los Alamos area constructed after about AD 1900).

Holocene—An epoch of the Quaternary period that began at the end of the Pleistocene, or the “Ice Age,” about 10,000 years ago and continuing to the present. It is named from the Greek words “holos” (entire) and “ceno” (new).

hot cell—A shielded facility that requires the use of remote manipulators for handling radioactive materials.

hydrology—The science dealing with the properties, distribution, and circulation of natural water systems.

hydrophobic soils—Non-permeable soil areas created as a result of very high temperatures often associated with wild fires).

Idaho National Laboratory (INL)—Formerly the Idaho National Engineering and Environmental Laboratory and the Argonne National Laboratory-West, INL is a U.S. Department of Energy (DOE) laboratory complex located in southeast Idaho about 25 miles west of Idaho Falls, that is managed and operated by a private consortium under contract to DOE.

incident-free risk—The radiological or chemical impacts resulting from emissions during normal operations and packages aboard vehicles in normal transport. This includes the radiation or hazardous chemical exposure of specific population groups and workers.

injection wells—A well that takes water from the surface into the ground, either through gravity or by mechanical means.

ion—An atom that has too many or too few electrons, causing it to be electrically charged.

ion exchange—A unit physiochemical process that removes anions and cations, including radionuclides, from liquid streams (usually water) for the purpose of purification or decontamination.

ion exchange resin—An organic polymer that functions as an acid or base. These resins are used to remove ionic material from a solution. Cation exchange resins are used to remove positively charged particles (cations), and anion exchange resins are used to remove negatively charged particles (anions).

ionizing radiation—Alpha particles, beta particles, gamma rays, high-speed electrons, high-speed protons, and other particles or electromagnetic radiation that can displace electrons from atoms or molecules, thereby producing ions.

irradiated—Exposure to ionizing radiation. The condition of reactor fuel elements and other materials in which atoms bombarded with nuclear particles have undergone nuclear changes.

isolates—A population of bacteria or other cells that has been isolated.

isotope—Any of two or more variations of an element in which the nuclei have the same number of protons (and thus the same atomic number), but different numbers of neutrons so that their atomic masses differ. Isotopes of a single element possess almost identical chemical properties, but often different physical properties (for example, carbon-12 and -13 are stable; carbon-14 is radioactive).

joule—A metric unit of energy, work, or heat, equivalent to one watt-second, 0.737 foot-pound, or 0.239 calories.

landscape character—The arrangement of a particular landscape as formed by the variety and intensity of the landscape features (land, water, vegetation, and structures) and the four basic elements (form, line, color, and texture). These factors give an area a distinctive quality that distinguishes it from its immediate surroundings.

latent cancer fatalities (LCFs)—Deaths from cancer occurring some time after, and postulated to be due to, exposure to ionizing radiation or other carcinogens.

lithic scatter—The description of rocks on the basis of such characteristics as color, mineralogic composition, and grain size.

loam—Soil material that is composed of 7 percent to 27 percent clay particles, 28 percent to 50 percent silt particles, and less than 52 percent sand particles.

long-lived radionuclides—Radioactive isotopes with half-lives greater than 30 years.

long-term impact—In general, an impact that endures beyond the timeframe of the action or activity that causes the impact.

low-income population—Low-income populations, defined in terms of Bureau of the Census annual statistical poverty levels (Current Population Reports, Series P-60 on Income and Poverty), may consist of groups or individuals who live in geographic proximity to one another or who are geographically dispersed or transient (such as migrant workers or American Indians), where either group experiences common conditions of environmental exposure or effect. (See environmental justice and minority population.)

low-level radioactive waste—Waste that contains radioactivity but is not classified as high-level waste, transuranic waste, spent nuclear fuel, or byproduct material as defined by Section 11e (2) of the Atomic Energy Act of 1954, as amended. Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium, may be classified as low-level radioactive waste, provided the concentration of transuranic waste is less than 100 nanocuries per gram.

material access area—A type of security area that is authorized to contain a security Category I quantity of special nuclear material and which has specifically defined physical barriers, is located within a Protected Area, and is subject to specific access controls.

material characterization—The measurement of basic material properties, and the change in those properties as a function of temperature, pressure, or other factors.

material control and accountability—The part of safeguards that detects or deters theft or diversion of nuclear materials and provides assurance that all nuclear materials are accounted for appropriately.

material disposal area (MDA)—An area used any time between the beginning of Los Alamos National Laboratory operations in the early 1940s and the present for disposing of chemically, radioactively, or chemically and radioactively contaminated materials.

maximally exposed individual (MEI)—A hypothetical individual whose location and habits result in the highest total radiological or chemical exposure (and thus dose) from a particular source for all exposure routes (inhalation, ingestion, direct exposure).

maximally exposed individual (transportation analysis)—A hypothetical individual receiving radiation doses from transporting radioactive materials on the road. For the incident-free transport operation, the maximally exposed individual would be an individual stuck in traffic next to the shipment for 30 minutes. For accident conditions, the maximally exposed individual is assumed to be an individual located approximately 33 meters (100 feet) directly downwind from the accident.

maximum contaminant level—The designation for U.S. Environmental Protection Agency standards for drinking water quality under the Safe Drinking Water Act. The maximum contaminant level for a given substance is the maximum permissible concentration of that substance in water delivered by a public water system. The primary maximum contaminant levels (40 CFR Part 141) are intended to protect public health and are federally enforceable. They are based on health factors, but are also required by law to reflect the technological and economic feasibility of removing the contaminant from the water supply. Secondary maximum contaminant levels (40 CFR Part 143) are set by the U.S. Environmental Protection Agency to protect the public welfare. The secondary drinking water regulations control substances in drinking water that primarily affect aesthetic qualities (such as taste, odor, and color) relating to the public acceptance of water. These regulations are not federally enforceable, but are intended as guidelines for the states.

megawatt—A unit of power equal to 1 million watts. Megawatt thermal is commonly used to define heat produced, while megawatt-electric defines electricity produced.

metabolomics—The study of the small molecules, or metabolites, contained in a human cell, tissue or organ (including fluids) and involved in primary and intermediary metabolism.

MeV (million electron volts)—A unit used to quantify energy. In this SWEIS, it describes a particle's kinetic energy, which is an indicator of particle speed.

micron—One-millionth of 1 meter.

migration—The natural movement of a material through the air, soil, or groundwater; also, seasonal movement of animals from one area to another.

Migratory Bird Treaty Act—This Act states that it is unlawful to pursue, take, attempt to take, capture, possess, or kill any migratory bird, or any part, nest, or egg of any such bird other than permitted activities.

millirem—One-thousandth of 1 rem.

minority population—Minority populations exist where either: (a) the minority population of the affected area exceeds 50 percent, or (b) the minority population percentage of the affected area is meaningfully greater than in the general population or other appropriate unit of geographic analysis (such as a governing body’s jurisdiction, a neighborhood, census tract, or other similar unit). “Minority” refers to individuals who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. “Minority populations” include either a single minority group or the total of all minority persons in the affected area. They may consist of groups of individuals living in geographic proximity to one another or a geographically dispersed/transient set of individuals (such as migrant workers or American Indians), where either group experiences common conditions of environmental exposure or effect. (See environmental justice and low-income population.)

mitigate—Mitigation includes: (1) avoiding an impact altogether by not taking a certain action or parts of an action; (2) minimizing impacts by limiting the degree or magnitude of an action and its implementation; (3) rectifying an impact by repairing, rehabilitating, or restoring the affected environment; (4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of an action; or (5) compensating for an impact by replacing or providing substitute resources or environments.

mixed waste—Waste that contains both nonradioactive hazardous waste and radioactive waste, as defined in this glossary.

National Ambient Air Quality Standards—Standards defining the highest allowable levels of certain pollutants in the ambient air (the outdoor air to which the public has access). Because the U.S. Environmental Protection Agency must establish the criteria for setting these standards, the regulated pollutants are called *criteria* pollutants. Criteria pollutants include sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and two size classes of particulate matter (less than or equal to 10 micrometers [0.0004 inches] in diameter and less than or equal to 2.5 micrometers [0.0001 inches] in diameter). Primary standards are established to protect public health; secondary standards are established to protect public welfare (such as visibility, crops, animals, buildings). (See criteria pollutant.)

National Emission Standards for Hazardous Air Pollutants—Emissions standards set by the U.S. Environmental Protection Agency for air pollutants which are not covered by National Ambient Air Quality Standards and which may, at sufficiently high levels, cause increased fatalities, irreversible health effects, or incapacitating illness. These standards are given in 40 CFR Parts 61 and 63. National Emission Standards for Hazardous Air Pollutants are given for many specific categories of sources (such as equipment leaks, industrial process cooling towers, dry cleaning facilities, petroleum refineries). (See hazardous air pollutants.)

National Environmental Policy Act (NEPA) of 1969—This Act is the basic national charter for protection of the environment. It establishes policy, sets goals (Section 101), and provides means (Section 102) for carrying out policy. Section 102(2) contains “action-forcing” provisions to ensure that Federal agencies follow the letter and spirit of the act. For major Federal actions significantly affecting the quality of the human environment, Section 102(2)(C) of the National Environmental Policy Act requires Federal agencies to prepare a detailed statement that includes the environmental impacts of the Proposed Action and other specified information.

National Historic Preservation Act—This Act provides that property resources with significant national historic value be placed on the National Register of Historic Places. It does not require any permits, but pursuant to Federal code, if a Proposed Action might impact a historic property resource, it mandates consultation with the proper agencies.

National Pollutant Discharge Elimination System—A provision of the Clean Water Act which prohibits discharge of pollutants into waters of the United States unless a special permit is issued by the U.S. Environmental Protection Agency, a state, or, where delegated, a tribal government on an Indian reservation. The National Pollutant Discharge Elimination System permit lists either permissible discharges, the level of cleanup technology required for wastewater, or both.

National Register of Historic Places—The official list of the Nation’s cultural resources that are worthy of preservation. The National Park Service maintains the list under direction of the Secretary of the Interior. Buildings, structures, objects, sites, and districts are included in the National Register for their importance in American history, architecture, archaeology, culture, or engineering. Properties included on the National Register range from large-scale, monumentally proportioned buildings to smaller-scale, regionally distinctive buildings. The listed properties are not just of nationwide importance; most are significant primarily at the state or local level. Procedures for listing properties on the National Register are found in 36 CFR Part 60.

natural phenomena accidents—Accidents that are initiated by phenomena such as earthquakes, tornadoes, floods, etc.

natural uranium—Uranium with the naturally occurring distribution of uranium isotopes (approximately 0.7-weight percent uranium-235, and the remainder essentially uranium-238). (See uranium, depleted uranium, enriched uranium, highly enriched uranium, and low-enriched uranium.)

neptunium-237—A manmade element, with the atomic number 93. Pure neptunium is a silvery metal. The neptunium-237 isotope has a half-life of 2.14 million years. When neptunium-237 is bombarded by neutrons, it is transformed to neptunium-238, which in turn undergoes radioactive decay to become plutonium-238. When neptunium-237 undergoes radioactive decay, it emits alpha particles and gamma rays.

neutron—An uncharged elementary particle with a mass slightly greater than that of the proton. Neutrons are found in the nucleus of every atom heavier than hydrogen-1.

neutron flux—The product of neutron number density and velocity (energy), giving an apparent number of neutrons flowing through a unit area per unit time.

nitrogen—A natural element with the atomic number 7. It is diatomic in nature and is a colorless and odorless gas that constitutes about four-fifths of the volume of the atmosphere.

nitrogen oxides—Refers to the oxides of nitrogen, primarily nitrogen oxide and nitrogen dioxide. These are produced in the combustion of fossil fuels and can constitute an air pollution problem. Nitrogen dioxide emissions contribute to acid deposition and formation of atmospheric ozone.

noise—Undesirable sound that interferes or interacts negatively with the human or natural environment. Noise may disrupt normal activities (hearing, sleep), damage hearing, or diminish the quality of the environment.

noise pollution—Any sound that is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying or undesirable.

nonattainment area—An area that the U.S. Environmental Protection Agency has designated as not meeting (not being in attainment of) one or more of the National Ambient Air Quality Standards for sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter. An area may be in attainment for some pollutants, but not for others. (See attainment area, National Ambient Air Quality Standards, and particulate matter.)

non-nuclear aboveground experimentation—Aboveground experimentation or testing in support of nuclear weapons programs that does not involve detonation of a nuclear explosive.

nonproliferation—Preventing the spread of nuclear weapons, nuclear weapon materials, and nuclear weapon technology.

normal operations—All normal (incident-free) conditions and those abnormal conditions that frequency estimation techniques indicate occur with a frequency greater than 0.1 events per year.

Notice of Intent (NOI)—Public announcement that an environmental impact statement will be prepared and considered. It describes the Proposed Action, possible alternatives, and scoping process, including whether, when, and where any scoping meetings will be held. The NOI is usually published in the *Federal Register* and local media. The scoping process includes holding at least one public meeting and requesting written comments on issues and environmental concerns that an environmental impact statement should address.

nuclear criticality—See criticality.

nuclear explosive—Any assembly containing fissionable and/or fusionable materials and main-charge high-explosive parts or propellants capable of producing a nuclear detonation.

nuclear facility—A facility that is subject to requirements intended to control potential nuclear hazards. Defined in U.S. Department of Energy directives as any nuclear reactor or any other facility whose operations involve radioactive materials in such form and quantity that a significant nuclear hazard potentially exists to the employees or the general public.

nuclear material—Composite term applied to—(1) special nuclear material; (2) source material such as uranium or thorium or ores containing uranium or thorium; and (3) byproduct material, which is any radioactive material that is made radioactive by exposure to the radiation incident to the process of producing or using special nuclear material.

nuclear reactor—A device that sustains a controlled nuclear fission chain reaction that releases energy in the form of heat.

Nuclear Regulatory Commission (NRC)—The Federal agency that regulates the civilian nuclear power industry in the United States.

nuclear weapon—The general name given to any weapon in which the explosion results from the energy released by reactions involving atomic nuclei, either fission, fusion, or both.

nuclear weapons complex—The sites supporting the research, development, design, manufacture, testing, assessment, certification, and maintenance of the Nation’s nuclear weapons and the subsequent dismantlement of retired weapons.

nuclide—A species of atom characterized by the constitution of its nucleus and hence by the number of protons, the number of neutrons, and the energy content.

Oak Ridge National Laboratory (ORNL)—A U.S. Department of Energy (DOE) laboratory complex located in eastern Tennessee about 25 miles west of Knoxville, that is managed and operated by a private consortium under contract to DOE.

Occupational Safety and Health Administration—The U.S. Federal Government agency that oversees and regulates workplace health and safety; created by the Occupational Safety and Health Act of 1970.

offsite—The term denotes a location, facility, or activity occurring outside the site boundary.

One- to three-room structure/fieldhouse—The remains of a small surface structure constructed of adobe, jacal, or masonry. This site typically consists of square to rectangular-shaped rock alignments, with individual units being no more than 3 m in length. The majority of these sites are identical to what many researchers term fieldhouses. Also included in the one- to three-room structure category is one example of a single unusually large rectangular structure, along with several smallish structures that are unusual due to the presence of upright stones or because of their location. Some of these “unusual” structures may represent shrines or other purposes not directly related to agriculture.

onsite—The term denotes a location or activity occurring within the boundary of a DOE complex site.

oralloy—Introduced in early Los Alamos documents to mean enriched uranium (Oak Ridge alloy); now uncommon except to signify highly enriched uranium.

outfall—The discharge point of a drain, sewer, or pipe as it empties into the environment.

ozone—The triatomic form of oxygen; in the stratosphere, ozone protects the Earth from the sun’s ultraviolet rays, but in lower levels of the atmosphere, ozone is considered an air pollutant.

package—For radioactive materials, the packaging, together with its radioactive contents, as presented for transport (the packaging plus the radioactive contents equals the package).

packaging—With regard to hazardous or radionuclide materials, the assembly of components necessary to ensure compliance with Federal regulations. It may consist of one or more receptacles, absorbent materials, spacing structures, thermal insulation, radiation shielding, and devices for cooling or absorbing mechanical shocks. The vehicle tie-down system and auxiliary equipment may be designated as part of the packaging.

paleontological resources—The physical remains, impressions, or traces of plants or animals from a former geologic age; may be sources of information on ancient environments and the evolutionary development of plants and animals.

particulate matter (PM)—Any finely divided solid or liquid material, other than uncombined (pure) water. A subscript denotes the upper limit of the diameter of particles included. Thus, PM₁₀ includes only those particles equal to or less than 10 micrometers (0.0004 inches) in diameter; PM_{2.5} includes only those particles equal to or less than 2.5 micrometers (0.0001 inches) in diameter.

perennial stream—A stream that flows throughout the year.

permeability—In geology, the ability of rock or soil to transmit a fluid.

person-rem—A unit of collective radiation dose applied to populations or groups of individuals; that is, a unit for expressing the dose when summed across all persons in a specified population or group. One person-rem equals 0.01 person-sieverts. (See collective dose.)

Perimeter Intrusion Detection and Assessment System (PIDAS)—A mutually supporting combination of barriers, clear zones, lighting, and electronic intrusion detection, assessment, and access control systems constituting the perimeter of the Protected Area and designed to detect, impede, control, or deny access to the Protected Area.

pit—The central core of a primary assembly in a nuclear weapon typically composed of plutonium-239 and/or highly-enriched uranium and other materials.

Plaza Pueblo—Contains one or more pueblo roomblocks that partially or completely enclose a plaza. Plaza pueblos typically are much larger (in both room numbers and site size) than single pueblo roomblock sites.

Pleistocene—The geologic time period of the earliest epoch of the Quaternary period, spanning between about 1.6 million years ago and the beginning of the Holocene epoch at 10,000 years ago. It is characterized by the succession of northern glaciations and also called the “Ice Age.”

plume—The elongated volume of contaminated water or air originating at a pollutant source such as an outlet pipe or a smokestack. A plume eventually diffuses into a larger volume of less contaminated material as it is transported away from the source.

plutonium—A heavy, radioactive, metallic element with the atomic number 94. It is produced artificially by neutron bombardment of uranium. Plutonium has 15 isotopes with atomic masses ranging from 232 to 246 and half-lives from 20 minutes to 76 million years.

plutonium-238—An isotope with a half-life of 87.74 years used as the heat source for radioisotope power systems. When plutonium-238 undergoes radioactive decay, it emits alpha particles and gamma rays. Plutonium-238 may fission if exposed to neutrons. The likelihood of plutonium-238 undergoing fission is dependent upon many factors including the number and energy of neutrons, temperature, plutonium-238 purity and shape, and the presence and proximity of other elements.

plutonium-239—An isotope with a half-life of 24,110 years that is the primary radionuclide in weapons-grade plutonium. When plutonium-239 decays, it emits alpha particles. Plutonium-239 may fission if exposed to neutrons. The likelihood of plutonium-239 undergoing fission is dependent upon many factors including the number and energy of neutrons, temperature, plutonium-239 purity and shape, and the presence and proximity of other elements.

population dose—See collective dose.

potential release site (PRS)—A site suspected of releasing or having the potential to release contaminants (radioactive, chemical, or both) into the environment. PRS is a generic term that includes solid waste management units and areas of concern that are cited and defined in the Compliance Order on Consent (Consent Order).

pounds per square inch—A measure of pressure; atmospheric pressure is about 14.7 pounds per square inch.

prehistoric resources—The physical remains of human activities that predate written records; they generally consist of artifacts that may alone or collectively yield otherwise inaccessible information about the past.

Prevention of Significant Deterioration—Regulations established to prevent significant deterioration of air quality in areas that already meet National Ambient Air Quality Standards. Specific details of Prevention of Significant Deterioration are found in 40 CFR 51.166. Among other provisions, cumulative increases in sulfur dioxide, nitrogen dioxide, and PM₁₀ levels after specified baseline dates must not exceed specified maximum allowable amounts. These allowable increases, also known as increments, are especially stringent in areas designated as Class I areas (such as national parks, wilderness areas) where the preservation of clean air is particularly important. All areas not designated as Class I are currently designated as Class II. Maximum increments in pollutant levels are also given in 40 CFR 51.166 for Class III areas, if any such areas should be so designated by EPA. Class III increments are less stringent than those for Class I or Class II areas. (See National Ambient Air Quality Standards.)

prime farmland—Land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oil-seed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, without intolerable soil erosion, as determined by the Secretary of Agriculture (Farmland Protection Act of 1981, 7 CFR Part 7, paragraph 658).

probabilistic risk assessment—A comprehensive, logical, and structured methodology that accounts for population dynamics and human activity patterns at various levels of sophistication, considering time-space distributions and sensitive subpopulations. The probabilistic method results in a more complete characterization of the exposure information available, which is defined by probability distribution functions. This approach offers the possibility of an associated quantitative measure of the uncertainty around the value of interest.

process—Any method or technique designed to change the physical or chemical character of the product.

protactinium—An element that is produced by the radioactive decay of neptunium-237. The pure metal has a bright metallic luster. The protactinium-233 isotope has a half-life of 27 days and emits beta particles and gamma rays during radioactive decay.

Protected Area—A type of security area defined by physical barriers (walls or fences), to which access is controlled, used for protection of security Category II special nuclear materials and classified matter and/or to provide a concentric security zone surrounding a Material Access Area (security Category I nuclear materials) or a Vital Area.

Proteomics—The analysis of the expression, localizations, functions, and interactions of the proteins expressed by the genetic material of an organism.

proton—An elementary nuclear particle with a positive charge equal in magnitude to the negative charge of the electron; it is a constituent of all atomic nuclei, and the atomic number of an element indicates the number of protons in the nucleus of each atom of that element.

Pueblo roomblock—The remains of a contiguous, multi-room habitation structure (four or more rooms with no enclosed plaza) constructed of adobe, jacal, or masonry. In several cases, somewhat amorphous mounds containing evidence of stone rubble but no distinct alignments were included in this category.

Quaternary—The second geologic time period of the Cenozoic era, dating from about 1.6 million years ago to the present. It contains two epochs: the Pleistocene and the Holocene. It is characterized by the first appearance of human beings on Earth.

rad—See radiation absorbed dose.

radiation (ionizing)—See ionizing radiation.

radiation absorbed dose (rad)—The basic unit of absorbed dose equal to the absorption of 0.01 joules per kilogram (100 ergs per gram) of absorbing material.

radioactive waste—In general, waste that is managed for its radioactive content. Waste material that contains source, special nuclear, or byproduct material is subject to regulation as radioactive waste under the Atomic Energy Act. Also, waste material that contains accelerator-produced radioactive material or a high concentration of naturally occurring radioactive material may be considered radioactive waste.

radioactivity—

Defined as a *process*: The spontaneous transformation of unstable atomic nuclei, usually accompanied by the emission of ionizing radiation.

Defined as a *property*: The property of unstable nuclei in certain atoms to spontaneously emit ionizing radiation during nuclear transformations.

radioisotope or radionuclide—An unstable isotope that undergoes spontaneous transformation, emitting radiation. (See isotope.)

radioisotope power system—Any one of a number of technologies used in spacecraft and in national security technologies that produces heat or electricity from the radioactive decay of suitable radioactive substances such as plutonium-238. They are typically used in applications such as to enable the operation of instruments and sensors where energy sources such as solar power are undesirable or impractical due to the remoteness or extreme conditions of the operating environment.

radioisotope thermoelectric generator (RTG)—An electrical generator that derives its electric power from heat produced by the decay of radioactive strontium-90, plutonium-238, or other suitable isotopes. The heat generated is directly converted into electricity, in a passive process, by an array of thermocouples.

radon—A gaseous, radioactive element with the atomic number 86, resulting from the radioactive decay of radium. Radon occurs naturally in the environment and can collect in unventilated enclosed areas, such as basements. Large concentrations of radon can cause lung cancer in humans.

RADTRAN—A computer code combining user-determined meteorological, demographic, transportation, packaging, and material factors with health physics data to calculate the expected radiological consequences and accident risk of transporting radioactive material.

reactor facility—Unless it is modified by words such as containment, vessel, or core, the term “reactor facility” includes the housing, equipment, and associated areas devoted to the operation and maintenance of one or more reactor cores. Any apparatus that is designed or used to sustain nuclear chain reactions in a controlled manner, including critical and pulsed assemblies and research, test, and power reactors, is defined as a reactor. All assemblies designed to perform subcritical experiments that could potentially reach criticality are also considered reactors.

Record of Decision (ROD)—A document prepared in accordance with the requirements of 40 CFR 1505.2 and 10 CFR 1021.315 that provides a concise public record of the U.S. Department of Energy’s (DOE) decision on a Proposed Action for which an environmental impact statement was prepared. A ROD identifies the alternatives considered in reaching the decision; the environmentally preferable alternative; factors balanced by DOE in making the decision; and whether all practicable means to avoid or minimize environmental harm have been adopted, and, if not, the reason why they were not.

reference dose—The chronic-exposure dose (milligram or kilogram per day) for a given hazardous chemical at which or below which adverse human noncancer health effects are not expected to occur.

region of influence (ROI)—A site-specific geographic area in which the principal direct and indirect effects of actions are likely to occur.

rem (roentgen equivalent man)—A unit of dose equivalent. The dose equivalent in rem equals the absorbed dose in rad in tissue multiplied by the appropriate quality factor and possibly other modifying factors. Derived from “roentgen equivalent man,” referring to the dosage of ionizing radiation that will cause the same biological effect as one roentgen of x-ray or gamma-ray exposure. One rem equals 0.01 sieverts. (See absorbed dose and dose equivalent.)

remediation—The process, or a phase in the process, of rendering radioactive, hazardous, or mixed waste environmentally safe, whether through processing, entombment, or other methods.

remote-handled waste—In general, refers to radioactive waste that must be handled at a distance to protect workers from unnecessary exposure (waste with a dose rate of 200 millirem per hour or more at the surface of the waste package). (See contact-handled waste.)

resin—See ion exchange resin.

Resource Conservation and Recovery Act (RCRA), as amended—A law that gives the U.S. Environmental Protection Agency the authority to control hazardous waste from “cradle to grave” (from the point of generation to the point of ultimate disposal), including its minimization, generation, transportation, treatment, storage, and disposal. The Resource Conservation and Recovery Act also sets forth a framework for the management of nonhazardous solid wastes. (See hazardous waste.)

riparian—Of, on, or relating to the banks of a natural course of water.

risk—The probability of a detrimental effect of exposure to a hazard. Risk is often expressed quantitatively as the probability of an adverse event occurring multiplied by the consequence of that event (in other words, the product of these two factors). However, separate presentation of probability and consequence is often more informative.

risk assessment (chemical or radiological)—The qualitative and quantitative evaluation performed in an effort to define the risk posed to human health and/or the environment by the presence or potential presence and/or use of specific chemical or radiological materials.

rock shelter—An overhang, indentation, or alcove formed naturally in a rock face or large boulder, or alternatively, a partly enclosed area created by rock falls leaning against a rock face or large boulder, and which exhibits evidence of human use. Rock shelters generally are not of great depth, in contrast to caves.

roentgen—A unit of exposure to ionizing x- or gamma radiation equal to or producing one electrostatic unit of charge per cubic centimeter of air.

runoff—The portion of rainfall, melted snow, or irrigation water that flows across the ground surface, and eventually enters streams.

Safe Drinking Water Act—This Act protects the quality of public water supplies, water supply and distribution systems, and all sources of drinking water.

safeguards—An integrated system of physical protection, material accounting, and material control measures designed to deter, prevent, detect, and respond to unauthorized access, possession, use, or sabotage of nuclear materials.

Safety Analysis Report—A report that systematically identifies potential hazards within a nuclear facility, describes and analyzes the adequacy of measures to eliminate or control identified hazards, and analyzes potential accidents and their associated risks. Safety analysis reports are used to ensure that a nuclear facility can be constructed, operated, maintained, shut down, and decommissioned safely and in compliance with applicable laws and regulations. Safety analysis reports are required for U.S. Department of Energy nuclear facilities and as a part of applications for U.S. Nuclear Regulatory Commission licenses. The U.S. Nuclear Regulatory Commission regulations or DOE Orders and technical standards that apply to the facility type provide specific requirements for the content of safety analysis reports. (See nuclear facility.)

sand—Loose grains of rock or mineral sediment formed by weathering that range in size from 0.0625 to 2.0 millimeters (0.0025 to 0.08 inches) in diameter, and often consists of quartz particles.

sandstone—A sedimentary rock composed mostly of sand-size particles cemented usually by calcite, silica, or iron oxide.

sanitary waste—Wastes generated by normal housekeeping activities, liquid or solid (includes sludge), that are not hazardous or radioactive.

Savannah River Site (SRS)—A U.S. Department of Energy (DOE) industrial complex located in southwestern South Carolina about 20 miles southeast of Augusta, Georgia, that is managed and operated by a private consortium under contract to DOE.

scope—In a document prepared pursuant to the National Environmental Policy Act of 1969, the range of actions, alternatives, and impacts to be considered.

scoping—An early and open process, including public notice and involvement, for determining the scope of issues to be addressed in an environmental impact statement (EIS) and for identifying the significant issues related to a Proposed Action. The scoping period begins after publication in the *Federal Register* of a Notice of Intent to prepare an EIS. The public scoping process is that portion of the process where the public is invited to participate. The U.S. Department of Energy’s scoping procedures are found in 10 CFR 1021.311.

security—An integrated system of activities, systems, programs, facilities, and policies for the protection of Restricted Data and other classified information or matter, nuclear materials, nuclear weapons and nuclear weapons components, and/or U.S. Department of Energy or contractor facilities, property, and equipment.

sediment—Soil, sand, and minerals washed from land into water that deposit on the bottom of a water body.

seismic—Pertaining to any Earth vibration, especially an earthquake.

seismicity—The frequency and distribution of earthquakes.

select agent—A select agent is defined as an agent, virus, bacteria, fungi, rickettsiae or toxin listed in Appendix A of *Federal Register* 29327 (42 CFR Part 72) titled, *Additional Requirements for Facilities Transferring or Receiving Select Agents*. Select Agents also includes (a) genetically modified micro-organisms or (b) genetic elements that contain nucleic acid sequences associated with pathogenicity from organisms listed in Appendix A, (c) genetically modified micro-organisms listed in Appendix A, and (d) genetically modified micro-organisms or genetic elements that contain nucleic acid sequences coding for any of the toxins in Appendix A, or their toxic subunits.

severe accident—An accident with a frequency rate of less than 10^{-6} per year that would have more severe consequences than a design-basis accident, in terms of damage to the facility, offsite consequences, or both. Also called a beyond-design-basis accident.

sewage—The total organic waste and wastewater generated by an industrial establishment or a community.

shielding—With regard to radiation, any material of obstruction (bulkheads, walls, or other construction) that absorbs radiation to protect personnel or equipment.

short-lived nuclides—Radioactive isotopes with half-lives no greater than about 30 years (such as cesium-137 and strontium-90).

short-term impact—In general, an impact that occurs during or for a short time after the action or activity that causes the impact.

silt—A sedimentary material consisting of fine mineral particles, intermediate in size between sand and clay. In general, soils categorized as silt show greater rates of erosion than soils categorized as sand.

soils—All unconsolidated materials above bedrock. Natural earthy materials on the Earth's surface, in places modified or even made by human activity, containing living matter, and supporting or capable of supporting plants out of doors.

solid waste management unit (SWMU)—Any discernible unit at which solid waste has been placed at any time, and from which the New Mexico Environment Department determines there may be a risk of a release of hazardous waste or hazardous waste constituents, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at the Facility (LANL) at which solid wastes have been routinely and systematically released; they do not include one-time spills. See 61 FR 19431 (May 1, 1996).

somatic effect—Any effect that may manifest in the body of the exposed individual over his or her lifetime.

source material—Depleted uranium, normal uranium, thorium, or any other nuclear material determined, pursuant to Section 61 of the Atomic Energy Act of 1954, as amended, to be source material, or ores containing one or more of the foregoing materials in such concentration as may be determined by regulation.

source term—The amount of a specific pollutant (chemicals, radionuclides) emitted or discharged to a particular environmental medium (air, water, earth) from a source or group of sources. It is usually expressed as a rate (amount per unit time).

spallation—A nuclear reaction in which the energy of the incident particle is so high that more than two or three particles are ejected from the target nucleus, and both its mass number and atomic number are changed.

special nuclear material(s)—A category of material subject to regulation under the Atomic Energy Act, consisting primarily of fissile materials. It is defined to mean plutonium, uranium-233, uranium enriched in the isotopes of uranium-233 or -235, and any other material that the Nuclear Regulatory Commission determines to be special nuclear material, but it does not include source material.

spectral characteristics—The natural property of a structure as it relates to the multidimensional temporal accelerations.

staging—The process of using several layers to achieve a combined effect greater than that of one layer.

stockpile—The inventory of active nuclear weapons for the strategic defense of the United States.

stockpile stewardship program—A program that ensures the operational readiness (safety and reliability) of the U.S. nuclear weapons stockpile by the appropriate balance of surveillance, experiments, and simulations.

straw wattles—Tubes of rice straw used for erosion control, sediment control and stormwater runoff control.

sulfur oxides—Common air pollutants (primarily sulfur dioxide), a heavy, pungent, colorless gas (formed in the combustion of fossil fuels, considered a major air pollutant) and sulfur trioxide. Sulfur dioxide is involved in the formation of acid rain. It can also irritate the upper respiratory tract and cause lung damage.

supernatant—The liquid that stands over a precipitated material.

surface water—All bodies of water on the surface of the Earth and open to the atmosphere, such as rivers, lakes, reservoirs, ponds, seas, and estuaries.

target—A tube, rod, or other form containing material that, on being irradiated in a nuclear reactor or an accelerator, would produce a desired end product.

technical area (TA)—Geographically distinct administrative units established for the control of LANL operations. There are currently 49 active TAs; 47 in the 41 square miles of the LANL site, one at Fenton Hill, west of the main site, and one comprising leased properties in town.

tectonic—Of or relating to motion in the Earth's crust and occurring on geologic faults.

Tertiary—The first geologic time period of the Cenozoic era (after the Mesozoic era and before the Quaternary period), spanning between about 66 million and 1.6 million years ago. During this period, mammals became the dominant life form on Earth.

threatened species—Any plants or animals that are likely to become endangered species within the foreseeable future throughout all or a significant portion of their ranges and which have been listed as threatened by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service following the procedures set out in the Endangered Species Act and its implementing regulations (50 CFR Part 424). (See endangered species.)

threshold limit values—The recommended highest concentrations of contaminants to which workers may be exposed according to the American Conference of Governmental Industrial Hygienists.

total effective dose equivalent—The sum of the effective dose equivalent from external exposures and the committed effective dose equivalent from internal exposures.

Toxic Substances Control Act of 1976—This Act authorizes the U.S. Environmental Protection Agency (EPA) to secure information on all new and existing chemical substances and to control any substances determined to cause an unreasonable risk to public health or the environment. This law requires that the health and environmental effects of all new chemicals be reviewed by the EPA before they are manufactured for commercial purposes.

transmutation—The transformation of one isotope into another isotope by changing its nuclear structure. It can occur naturally through radioactive decay, or the fission and neutron capture processes can be hastened by using nuclear reactors or particle accelerators. By converting long-lived hazards into materials that are, or soon will be, stable and harmless, the nuclear cycle is effectively complete.

transuranic—Refers to any element whose atomic number is higher than that of uranium (atomic number 92), including neptunium, plutonium, americium, and curium. All transuranic elements are produced artificially and are radioactive.

transuranic waste—Radioactive waste containing more than 100 nanocuries (3,700 becquerels) of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years, except for: (1) high-level radioactive waste; (2) waste that the Secretary of Energy has determined, with the concurrence of the Administrator of the Environmental Protection Agency, does not need the degree of isolation required by the 40 CFR Part 191 disposal regulations; of (3) waste that the U.S. Nuclear Regulatory Commission has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61 (DOE 435.1).

tuff—A fine-grained rock composed of ash or other material formed by volcanic explosion or aerial expulsion from a volcanic vent.

Type B packaging—A regulatory category of packaging for transportation of radioactive material. The U.S. Department of Transportation and U.S. Nuclear Regulatory Commission require Type B packaging for shipping highly radioactive material. Type B packages must be designed and demonstrated to retain their containment and shielding integrity under severe accident conditions, as well as under the normal conditions of transport. The current U.S. Nuclear Regulatory Commission testing criteria for Type B package designs (10 CFR Part 71) are intended to simulate severe accident conditions, including impact, puncture, fire, and immersion in water. The most widely recognized Type B packages are the massive casks used for transporting spent nuclear fuel. Large-capacity cranes and mechanical lifting equipment are usually needed to handle Type B packages.

Type B shipping cask—A U.S. Nuclear Regulatory Commission-certified cask with a protective covering that contains and shields radioactive materials, dissipates heat, prevents damage to the contents, and prevents criticality during normal shipment and accident conditions. It is used for transport of highly radioactive materials and is tested under severe, hypothetical accident conditions that demonstrate resistance to impact, puncture, fire, and submersion in water.

unconformably—Refers to a break or gap in the geological time of deposited materials.

uranium—A radioactive, metallic element with the atomic number 92; one of the heaviest naturally occurring elements. Uranium has 14 known isotopes, of which uranium-238 is the most abundant in nature. Uranium-235 is commonly used as a fuel for nuclear fission. (See natural uranium, enriched uranium, highly enriched uranium, and depleted uranium.)

Vadose zone—The portion of Earth between the land surface and the water table.

vault (special nuclear material)—A penetration-resistant, windowless enclosure having an intrusion alarm system activated by opening the door and which also has—walls, floor, and ceiling substantially constructed of materials that afford forced-penetration resistance at least equivalent to that of 20-centimeter- (8-inch-) thick reinforced concrete; and a built-in combination-locked steel door, which for existing structures is at least 2.54-centimeters (1-inch) thick exclusive of bolt work and locking devices, and which for new structures meets standards set forth in Federal specifications and standards.

viewshed—The extent of an area that may be viewed from a particular location. Viewsheds are generally bounded by topographic features such as hills or mountains.

volatile organic compounds—A broad range of organic compounds, often halogenated, that vaporize at ambient or relatively low temperatures, such as benzene, chloroform, and methyl alcohol. With regard to air pollution, any organic compound that participates in atmospheric photochemical reaction, except for those designated by the U.S. Environmental Protection Agency Administrator as having negligible photochemical reactivity.

waste acceptance criteria—The requirements specifying the characteristics of waste and waste packaging acceptable to a disposal facility, and the documents and processes the generator needs to certify that the waste meets applicable requirements.

waste classification—Wastes are classified according to DOE Order 435.1, Radioactive Waste Management, and include high-level, transuranic, and low-level wastes.

Waste Isolation Pilot Plant (WIPP)—A U.S. Department of Energy facility designed and authorized to permanently dispose of defense-related transuranic waste in a mined underground facility in deep geologic salt beds. It is located in southeastern New Mexico, 42 kilometers (26 miles) east of the city of Carlsbad.

waste management—The planning, coordination, and direction of those functions related to generation, handling, treatment, storage, transportation, and disposal of waste, as well as associated surveillance and maintenance activities.

waste minimization and pollution prevention—An action that economically avoids or reduces the generation of waste and pollution by source reduction, reducing the toxicity of hazardous waste and pollution, improving energy use, or recycling. These actions will be consistent with the general goal of minimizing present and future threats to human health, safety, and the environment.

water table—The boundary between the unsaturated zone and the deeper, saturated zone. The upper surface of an unconfined aquifer.

watt—A unit of power equal to 1 joule per second. (See joule.)

wetland—Wetlands are “... those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas” (33 CFR 328.3).

whole-body dose—In regard to radiation, dose resulting from the uniform exposure of all organs and tissues in a human body. (See effective dose equivalent.)

wind rose—A circular diagram showing, for a specific location, the percentage of the time the wind is from each compass direction. A wind rose for use in assessing consequences of airborne releases also shows the frequency of different wind speeds for each compass direction.

yield—The force in tons of TNT of a nuclear or thermonuclear explosion.