FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM

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LINDE GLOSSARY

This fact sheet has been prepared as part of the effort to familiarize the public with the specific vocabulary used in discussions about environmental restoration in the Formerly Utilized Sites Remedial Action Program at the Linde site.

100 square meters – area specified by 40 CFR 192.12 for the application of radium-226 soil criteria.

ARARs - Applicable or relevant and appropriate requirements, a comprehensive set of laws and regulations that are relevant to guide the selection of cleanup activity at a particular site.

Background radiation – natural radioactivity in the environment, including naturally radioactive elements in the earth (primarily uranium, thorium, radium, and potassium). For the Linde site, background concentrations for isotopes of certain earth elements are estimated as 3.1 pCi/g of uranium-238, 1.4 pCi/g of thorium-230, and 1.1 pCi/g of radium-226.

CANiT - Coalition Against Nuclear Materials in Tonawanda, a stakeholder group interested in the Formerly Utilized Sites Remedial Action Program sites in Tonawanda.

CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act (also known as Superfund), the federal law that guides cleanup of hazardous waste sites.

CFR - Code of Federal Regulations

Cleanup - The general term for environmental restoration, the process designed to ensure that risks to the environment and to human health and safety from waste sites either are eliminated or reduced to prescribed, safe levels.

Comment period - Time provided for the public to review and comment formally on a proposed action or decision.

Commercial/industrial scenario – model in which the worker is assumed to be on site 8 hours per day, five days per week, 50 weeks per year over an exposure duration of 25 years. (See **Scenario**.)

LINDE GLOSSARY

Community relations - The effort to establish two-way communication with the public to ensure public input into the decision-making process related to Superfund and environmental restoration.

Construction worker scenario – model in which the worker is assumed to be on site 8 hours per day, five days per week, 8 weeks per year, for 9 years. (Assumes the worker is involved with construction, maintenance or utility activities). (See **Scenario**.)

Contamination - The presence of foreign materials, chemicals or radioactive substances in the environment (soil, sediment, water or air) in significant concentrations.

Corps - U.S. Army Corps of Engineers, the lead federal agency charged by Congress with the execution of the Formerly Utilized Sites Remedial Action Program.

Cubic yards (cy) - A unit equal to the volume of a cube measuring one yard in each dimension.

Curie - A unit of radioactivity that represents the amount of radioactivity associated with one gram of radium. To say that a sample of radioactive material exhibits one Curie of radioactivity means that the element is emitting radiation at the rate of 3.7 million times a second. Named after Marie Curie, an early nuclear scientist.

DOE - U.S. Department of Energy

Dose - Quantity of radiation or energy absorbed; measured in rads. (See **Rad**.)

Dose equivalent - A term used to express the amount of effective radiation received by an individual. A dose equivalent considers the type of radiation, the amount of body exposed, and the risk of exposure. Measured in rems. (See **Rem**.)

EE/CA - Engineering Evaluation and Cost Analysis, which is a CERCLA document, prepared to address interim cleanup activities.

Exposure - A measurement of the displacement of electrons from atoms caused by x-rays or by gamma radiation. Acute exposure generally refers to a high level of exposure of short duration; chronic exposure is lower-level exposure of long duration.

Feasibility Study - the Superfund study following a remedial investigation which identifies, develops, evaluates and selects remedial action alternatives.

FUSRAP - Formerly Utilized Sites Remedial Action Program, which was created in 1974 to study sites used during World War II through the ‘50s as part of the nation’s atomic energy program. These early sites were decontaminated under guidelines in effect during that period. Using today’s more-stringent environmental laws and better technology, the Corps of Engineers will restore these environmentally damaged sites.

LINDE GLOSSARY

Impacted area – media containing contaminant of concern in a concentration where removal would be warranted for the specified cleanup criteria.

Isotopes - Atoms of the same element that have equal numbers of protons, but different numbers of neutrons. Isotopes of an element have the same atomic number but different atomic mass. (e.g. uranium-238 and uranium-235.

Millirem - A unit of radiation dosage equal to one-thousandth of a rem. A member of the public can safely receive up to 500 millirems per year, according to federal standards, but the U.S. EPA ordinarily limits public exposure to 25 to 100 mrem/year.

Natural radiation - Radiation that is always present in the environment from such sources as cosmic rays and radioactive materials in rocks and soils. Also known as background radiation.

NCP - National Oil and Hazardous Substances Pollution Contingency Plan, which implements CERCLA

NRC - Nuclear Regulatory Commission

Pathway - The means by which contaminants move. Possible pathways include air, surface water, groundwater, plants and animals.

PicoCurie (pCi) - Measurement of radioactivity. A picoCurie is one million millionth, or a trillionth, of a curie, and represents about 2.2 radioactive particle disintegrations per minute.

Proposed Plan - a CERCLA document on which the public comments that summarizes what cleanup remedy has been selected, and why.

Risk Assessment - the study and estimation of risk from a current or proposed activity. Involves estimates of the probability and consequence of an action.

Rad - Radiation absorbed dose, a measurement of ionizing radiation absorbed by any material. A rad measures the absorption of a specific amount of work (100 ergs) in a gram of matter.

Radiation - Fast particles and electromagnetic waves emitted from the nucleus of an atom during radioactive disintegration.

Radioactive - Giving off, or capable of giving off, radiant energy in the form of particles (alpha or beta radiation) or rays (gamma radiation) by the spontaneous disintegration of the nuclei of atoms. Radioisotopes of elements lose particles and energy through the process of radioactive decay. Elements may decay into different atoms or a different state of the same atom.

LINDE GLOSSARY

Radium - One of four primary radionuclides in FUSRAP wastes. They include radium-226, radon-222, thorium-230, uranium-234, uranium-235 and uranium-238.

Rem - Roentgen equivalent man, a unit used in radiation protection to measure the amount of damage to human tissue from a dose of ionizing radiation. Incorporates the health risks from radiation.

Remedial action - Long-term cleanup activities

Remedial design - A phase of remedial action that follows the remedial investigation/feasibility study and includes development of engineering drawings and specifications for a site cleanup.

Remediation - Those activities performed to remove or treat hazardous waste sites or to relieve their effects.

Removal Action - Interim cleanup activities that are identified as needed to protect public health and the environment.

Remedial Investigation - the CERCLA process of determining the extent of hazardous substance contamination and, as appropriate, conducting treatability investigations.

Residential scenario – resident uses municipal water supply, and receives 5% food sustenance from property. Amount of time spent indoors and outdoors is 108 and 3 hours per week, respectively for 50 weeks a year. (See **Scenario**.)

Resident farmer scenario - resident uses groundwater and receives majority of food sustenance from property. (See **Scenario**.)

Risk communication - The exchange of information about health or environmental risks between risk assessors, risk managers, the general public, news media, interest groups, etc.

Risk management - The process of evaluating alternative regulatory and non-regulatory responses to risk and selecting among them. The selection process necessarily requires the consideration of legal, economic and social factors.

ROD - Record of Decision, a written decision that identifies the selected method for long-term cleanup of contamination at a site.

SAIC - Science Applications International Corp., the environmental documentation contractor for the Formerly Utilized Sites Remedial Action Program.

SARA - Superfund Amendments and Reauthorization Act

LINDE GLOSSARY

Scenario – model outlining specific parameters to assess an individual's exposure to a contaminant of concern.

Source term – The concentration of contaminants of concern for the media being assessed.

Surface average - The mean value representative of the concentration of contaminants in the top 15 cm of soil for a specified area.

Surface maximum (Hotspot) - The maximum allowed value representative of the concentration of contaminants in the top 15 cm of soil for a specified area.

Thorium - A naturally occurring radioactive element and one of four primary radionuclides in FUSRAP wastes. They include radium-226, radon-222, uranium-234, uranium-235 and uranium-238.

Threshold dose - The minimum dose of radiation that will produce a detectable effect.

Uranium - The heaviest element found in nature. Approximately 997 out of every 1000 uranium atoms are uranium-238. The remaining 3 atoms are the fissile uranium-235. The uranium-235 atom splits, or fissions, into lighter elements when its nucleus is struck by a neutron. One of four primary radionuclides in FUSRAP wastes, including radium-226, radon-222 and thorium-230.

Sources:

- *Glossary of Environmental Restoration Terms and Acronym List* (EPA/OPA-87-017, August 1988)
- *Glossary of Environmental Restoration* (DOE, Office of Environmental Restorations and Waste Management, Oak Ridge Operations, October 1990 and October 1991)